### PLANE IN THE MIDDLE: A HISTORY OF

### THE U.S. AIR FORCE'S DEDICATED CLOSE

#### AIR SUPPORT PLANE

by

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#### A DISSERTATION

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### ABSTRACT

Close air support for ground forces can decisively affect battles, but it is difficult to accomplish due to differences in air and ground force perspectives and warfighting priorities. However, the American military accomplishes this mission more than any other national military arm because it relies upon technology in the form of ample firepower to win battles and save troops' lives. Ironically, the best close air support plane is not the latest and fastest fighter. It is instead a slower and more durable tactical plane. Air combat history confirms this conclusion, but the mission and its plane's existence rely upon the historical, technological, and procurement outlooks of the two services--the Army and the Air Force--involved in this truly joint mission.

Their relationship through the 1960s featured the airmen's struggle to separate from the Army, air power's decisive role in World War II, and interservice friction after that war. During those years, the Air Force neglected close air support because it emphasized strategic bombing and because it thought fighter planes could accomplish the mission without much practice. The Army's development of attack helicopters and the Air Force's own embarrassing unreadiness for close air support in Vietnam sparked the airmen's fears that they might lose the mission. Thus, for the first time, the Air Force in 1966 commenced purchase of a dedicated close air support plane.

After ten years of political maneuvering, budget decisions, technological developments, and doctrinal changes, a more enthusiastic Air Force leadership fielded the A-10. For the rest of the 1970s, the leaders strove to prove the plane's worth. However, in the early 1980s, the Army's own doctrinal evolution and a new tactical fighter, the F-16, changed their attitude. Air Force leaders then claimed that modern air defenses, the Army's new warfighting style, and the F-16's multimission capabilities made CAS and the A-10 obsolete. Their action ignited a bureaucratic, political, and defense media fight against those who valued the mission and its plane. Political action, budgetary exigencies, and the A-10's success in Desert Storm reaffirmed the dedicated close air support plane's worth. Post-Cold War demands revealed the mission's importance as well.

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### LIST OF ABBREVIATIONS AND ACRONYMS

- A Attack.
- AAA Anti-Aircraft Artillery.
- AAD Air Assault Division.
- AAF Army Air Force.
- AAFSS Advanced Aerial Fire Support System.
- AAH Advanced Attack Helicopter.
- AASAC Army Aviation School and Center.
- AATC Air National Guard and Air Force Reserve Test Center.
- AC Attack/Cargo.
- ACC Air Combat Command.
- ADM Admiral.
- AFA Air Force Association.
- AFB Air Force Base.
- AFHRC Air Force Historical Research Center.
- AFJ Armed Forces Journal.
- AFJI Armed Forces Journal International.
- <u>AFM</u> <u>Air Force Magazine</u>.
- AFMC Air Force Material Command.
- AFOTEC Air Force Test and Evaluation Center.
- AFRDQ Directorate of Research and Development, Operational Requirements, and Development Plans Office.

- <u>AFT</u> <u>Air Force Times</u>.
- AGL Above Ground Level.
- AGM Air-to-Ground Missile.
- AH Attack Helicopter.
- AJAAT Advanced Joint Air Attack Tactics (or Team, depending on context).
- AL Alabama.
- ALFA Air-Land Forces Application.
- AMHI Army Military History Institute.
- ANG Air National Guard.
- ASCIET All Services Combat Identification Evaluation Team.
- ASD Armaments System Division.
- ATHS Automatic Target Hand-off System.
- ATP Allied Tactical Publication.
- AUR <u>Air University Review</u>.
- AV VSTOL Attack.
- AVM Air Vice Marshal.
- AWACS Airborne Warning and Control System
- AW&ST Aviation Week & Space Technology.
- A-X Designation for dedicated CAS plane project.
- AZ Arizona.
- B Bomber.
- BAI Battlefield Air Interdiction.

- BDA Bomb Damage Assessment.
- BDM Braddock, Dunn, and McDonough
- BGEN Brigadier General.
- BRL Ballistic Research Laboratory.
- C Cargo.
- CA California.
- CAPT Captain.
- CAS Close Air Support.
- CASADA Close Air Support Aircraft Design Alternatives study.
- CASMARG Close Air Support Mission Area Review Group.
- CCTS Combat Crew Training Squadron.
- CDC Combat Developments Command.
- CFP Concept Formulation Package.
- CHECO Contemporary Historical Evaluation of Combat Operations.
- CO Colorado.
- COEA Cost and Operational Effectiveness Analysis.
- COIN Counter-Intelligence
- COL Colonel.
- CONARC Continental Army Command.
- <u>CPGW</u> <u>Conduct of the Persian Gulf War</u>.
- CT Connecticut.
- CT ANG Connecticut Air National Guard.

D	Democrat.
D.C.	District of Columbia.
DCP	Development Concept Paper.
DDR&E	Director of Defense Research & Engineering.
DoD	Department of Defense.
DOL	Dispersed Operating Location.
DOT	Directorate of Training.
DSARC	Defense System Acquisition Review Council.
DTG	Date-time-group.
DVIC	Defense Visual Information Center.
ECM	Electronic Countermeasures.
ed.	editor; edited by; or edition, depending on context.
F	Fighter.
FAC	Forward Air Controller.
F-Kill	Firepower Kill.
FL	Florida.
FLIR	Forward-looking Infrared.
FM	Field Manual.
FOL	Forward Operating Location.
FOLTA	Forward Operating Location Training Area.
FWIC	Fighter Weapons Instructor Course.
<u>FWR</u>	Fighter Weapons Review.

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- FWS Fighter Weapons School.
- FWW Fighter Weapons Wing.
- F-X Designation for F-15 project.
- FY Fiscal Year.
- GA Georgia.
- GAO Government Accounting Office.
- GAU Gun, Automatic.
- GE General Electric.
- GEN General.
- GPO Government Printing Office.
- GPS Global Positioning System.
- <u>GWAPS</u> <u>Gulf War Air Power Survey</u>.
- HASC House Armed Services Committee.
- HQ Headquarters.
- IAF Israeli Air Force.
- IDA Institute for Defense Analysis.
- IDR International Defense Review.
- IIR Imaging Infrared.
- IL Illinois.
- INS Inertial Navigation System.
- IOC Initial Operational Capability.
- JAAT Joint Air Attack Team (or Tactics, depending on context).

JAWS	Joint Attack Weapons Systems
JSTARS	Joint Surveillance Target Attack System.
Ju	Junkers.
ККМС	King Khalid Military City.
K-Kill	Catastrophic Kill.
LACAS	Low Altitude Close Air Support.
LARA	Light Armed Reconnaissance Aircraft.
LASTE	Low-altitude Safety and Targeting Enhancement.
LAVP	Lot Acceptance Verification Program.
LTCOL	Lieutenant Colonel.
LTGEN	Lieutenant General.
LTV	Ling-Temco-Vought.
MACV	Military Assistance Command, Vietnam.
MAFB	Maxwell Air Force Base.
MAJ	Major.
Maj Gen	Major General.
MCPL	Members of Congress for Peace through Law.
MD	Maryland.
Ме	Messerschmitt.
MGEN	Major General.
Mi	Mil (Russian Aircraft Builder).
MiG	Mikoyan Gurevich.

MIT	Massachusetts Institute of Technology.
M-Kill	Mobility Kill.
MLRS	Multiple Launched Rocket System.
MNS	Mission Needs Statement.
MO	Missouri.
MOB	Main Operating Base.
MR	Military Review.
MRP	Mission Requirements Package.
MS	Mississippi.
NATO	North Atlantic Treaty Organization.
N/AW	Night/All-weather.
NC	North Carolina.
NH	New Hampshire.
NTC	National Training Center.
NV	Nevada.
NVG	Night Vision Goggles.
NY	New York.
OA	Observation/Attack.
ОН	Ohio.
OSD	Office of the Secretary of Defense.
OT&E	Operaional Test & Evaluation.
ov	Fixed-wing Observation.

PA	Pennsylvania.
PACAF	Pacific Air Forces.
PA&E	Program Analysis & Evaluation.
Ph.D.	Doctor of Philosophy.
P.L.	Public Law.
PSAC	President's Science Advisory Committee.
R	Republican.
RAD	Requirements Action Directive.
RAF	Royal Air Force.
RAN	Royal Australian Navy.
ret.	retired.
RFP	Request for Proposal.
S	Surveillance.
SA	Soviet SAM designation (see below).
SAB	Scientific Advisory Board.
SAC	Strategic Air Command.
SAF-OII	Secretary of the Air Force, Office of Internal Information.
SAM	Surface-to-Air Missile.
SAR	Search and Rescue.
SASC	Senate Armed Services Committee.
SC	South Carolina.
SECDEF	Secretary of Defense.

SLUF	Short Little Ugly Fellow-A-7 nickname.
SPO	System Program Office.
SQN LDR	Squadron Leader.
STOL	Short-Field-Takeoff-and-Land.
STOVL	Short-Field-Takeoff-and-Vertical-Land.
Su	Sukhoi.
Т	Soviet Tank, or Aircraft Trainer, depending on context.
TAC	Tactical Air Command.
TASVAL	Joint Test of Tactical Aircraft Effectiveness in Close Air Support Anti-Armor Operations.
TD&E	Tactics Development & Evaluation.
TF	Turbofan.
TFS	Tactical Fighter Squadron.
TFTW	Tactical Fighter Training Wing.
TFW	Tactical Fighter Wing.
TFWC	Tactical Fighter Weapons Center.
TFX	Designation for F-111 project.
TOW	Tube-launched, Optically-aimed, Wire-guided missile.
TRADOC	Training and Doctrine Command.
TTW	Tactical Training Wing.
ТХ	Texas.
U	Utility.
UCAV	Uninhabited Combat Aerial Vehicle

- UH Utility Helicopter.
- U.N. United Nations.
- U.S. United States.
- USA United States Army.
- USAAD United States Army Aviation Digest.
- USAAF United States Army Air Force.
- USAF United States Air Force.
- USAFR United States Air Force Reserve.
- USDR&E United States Directorate of Research & Engineering (part of OSD).
- USMC United States Marine Corps.
- USMCR United States Marine Corps Reserve.
- USN United States Navy.
- USSR Union of Soviet Socialist Republics.
- VA Virginia.
- VADM Vice Admiral.
- VAL Designator for Navy light attack plane project.
- VTOL Vertical-Takeoff-and-Land
- V/STOL Vertical-and-Short-Takeoff-and-Land.
- WC Wing Commander.
- WI Wisconsin.
- WPAFB Wright-Patterson Air Force Base.
- WSEG Weapons System Evaluation Group.

ZSU Soviet radar AAA designation.

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# CHAPTER I INTRODUCTION

A joke appeared in <u>The Reader's Digest</u> in July 1967, as America's involvement in the Vietnam War deepened, and Americans became more aware of the tactics that their military used. It seems that a boy returned from Sunday school and his mother asked him what he had learned. He said that he learned about how Moses and his people escaped from Pharaoh's Egypt. He told her that as Pharaoh's tanks approached the Israelites, Moses got on the radio and called in an air strike, which knocked them out of action. The puzzled mother asked, "Is that really the way the teacher told the story?" The boy replied, "If I told it her way, you'd never believe it!"<sup>1</sup>

Thus it is with close air support, known also by its acronym, CAS. CAS is a technological dream for war. One expects that ground troops should be able to use airplanes to assist their battlefield efforts with extra firepower. The pilots and their planes possess the ability to range over the battlefield in a manner that the soldiers lack. With their high speed and their ability to carry very lethal weapons, they can surprise the enemy with a hard knock. They not only can destroy the enemy currently vexing the ground commander, but they also can spot and hit forces the soldiers cannot see from the ground. It seems so easy and so logical. And as the joke implied, the American military developed and used it so well in Vietnam that people took it for granted.

But CAS is anything but easy to accomplish. Indeed, the very term defies easy definition. How close is close? The U.S. Air Force definition for much of that service's existence went something like this: support of troops engaged or nearly engaged in combat so that close coordination is required with the ground units. However, details within the definition changed throughout the Air Force's history, even before it became a separate service. Indeed, even after the Vietnam War--a conflict where the Air Force accomplished CAS so well--a survey of Army and Air Force officers revealed no agreement about either its definition or other terms associated with its accomplishment.

Excerpt from "Laughter, the Best Medicine," The Reader's Digest, July 1967, 4.

Further, even if one accepts the above definition, there are other problems. The perspective difference between the airman and the soldier is wide. Things do not appear the same on the ground as they do in the air. To the infantryman, an enemy tank one-hundred yards away is conspicuous, not only because of its size but also due to the severe danger it represents. To a pilot preparing to attack the tank from a mile and a half away, it is a large dot; and if its camouflage matches the surroundings, it may not even be visible. On the other hand, the pilot sees features that the soldier cannot see; thus, if the soldier says to attack the troops in the red-roofed barn, the pilot may see many such barns. Further, the battle area itself is often a confusing, dusty, and smoky chaos involving forces on both sides frantically maneuvering for advantage. The opposing lines are rarely well defined. One cannot say that one will merely attack everyone facing in a certain direction, for in the heat of battle, both forces often face in all directions. In fact, the battle can be so confusing that those directing the planes—whether ground controllers or dedicated airborne controllers who know the battle area-are confused about who is friend or foe.

However, confirming the foe's location and effectively merging the air and ground perspectives is of life and death importance, for the pilot cannot expend ordnance until the target is properly identified. Otherwise, one risks shooting the wrong target, or tragically, the friendly troops who expect support. Therefore, good communication is necessary, and though one assumes that airmen and soldiers easily communicate with one another, this is not always so. Two different military organizations *can* procure different radios with different frequencies and a lack of capability for air-ground communication. This is a pitfall that requires active effort to resolve. Beyond that, there are visual signals, but these must be agreed upon by all concerned; and woe betide the ground force whose signals become known to its enemy! In more recent times, laser designators and data link devices which instantly transfer target information to airplanes' fire control computers offer the promise of quick, reliable target designation. But this is piling more technology upon an already complex technological undertaking. One asks what happens if the equipment breaks down, or if there is operator error, or if either the soldiers or the airplane have the wrong equipment or none at all?

Communications also involves providing a means for the ground party to call for air strikes in the first place. The U.S. Marines Corps' air task structure is relatively streamlined, given that it is a self-contained operation in a service which emphasizes air power as a substitute for artillery during amphibious operations. But the Air Force-Army air task system crosses a boundary between two services with a long, turbulent past between them. Beyond that, one must determine what ground unit level asks for the support; one cannot send planes hither and yon in response to every nervous platoon leader's pleas. Normally, the U.S. Army battalion is the lowest level that makes a CAS request, but even this far up, it makes a long trip up the operational Army chain of command to determine its priority and whether Army firepower can support it instead. If an air support request gets this far, it goes to the Air Force command chain which determines whether there are any planes that can answer it. If so, it becomes an air task for some flight of planes who hopefully can get to the battle quickly enough to make a difference. The process is an eye poppingly complex one, and requires proper manning and constant active use to work.

The air task setup brings up another perspective-related problem with this mission. The soldiers and airmen see war itself differently. There are many soldiers and relatively few airmen, and the soldier's months of training pales next to the years required to produce a competent tactical pilot. Though Army equipment—tanks, for example—inch up the cost ladder, they still do not even closely match the cost of the average Air Force fighter. Unless air units are at a base near the front, the Army's fortunes may be important to the airmen (especially when they are flying near the battle area), but they are not as compelling as they are to a tank commander or infantryman in constant direct contact with enemy guns. Indeed, to the ground troops, the immediate objective and the enemy directly in front of them are the most important things in the world, and the soldiers move only in coordination with other friendly ground units. The pilots see themselves as able to move independently, and relatively freely over terrain. They can move very quickly, too. Their restrictions are likewise things that are seemingly irrelevant to the ground troops. They do not like flying in a machine that is helpless against enemy fighters. Dense anti-aircraft fire

can appear in areas that are out of the soldier's ken. Fuel considerations and pilot fatigue bring back to earth even those planes with the best endurance. Therefore, they cannot remain around the battle area indefinitely while the ground folks sort themselves out. Weather that is a nuisance to the soldiers can ground the airmen or prevent them from executing CAS. Finally, the airmen's strategic and tactical objectives and priorities vary from that of the soldiers. They tell the soldiers that air support is not possible if they do not first succeed in denying the enemy air force the air. They will also point out that interdiction against enemy forces in the rear often yields better results both for the air effort and the ground campaign's longer term. They may even say that strategic targets deep in the enemy's homeland rate a higher priority effort than the enemy army.

The return for effort introduces one other factor germane to CAS. Of all the airmen's missions, many consider it the most dangerous. A fighter patrol may yield no contact if the enemy's planes do not appear or cannot be engaged. An interdiction mission can be very dangerous *if* there is fighter opposition and dense belts of antiaircraft fire. However, it often features flight routes over unarmed people, even if they are enemy. But CAS is *always* a mission against an armed group of people. Along with the dedicated antiaircraft batteries, nearly all of the enemy--perhaps thousands of troops in a small area--are armed. Their weapons may be only rifles and light machine guns and they may not know how to shoot at an airplane; but if the CAS pilot has to venture near the target to hit it, then the metallic maelstrom from all of the aimed and barrage fire can down his plane, no matter how fast or sophisticated it is. And quite often, CAS pilots have to get near the target in order first to correctly identify it and then to hit it. Last, though their perspectives vary, CAS pilot compassion for truly beleaguered soldiers often leads to taking tactically lethal risks to save them.

The two units, or services, involved in the CAS equation can also present a difficulty factor. Both ground and air sides must be interested in the mission to make it work. As such, personalities can be important. The history of relations between the units, as well as past air support successes and failures, may affect the mission. The airmen may feel strongly that they have only enough assets to guarantee success for air superiority and

interdiction, and not the more costly and complex CAS mission. The soldiers may feel that they have the weapons and wherewithal to handle their opponents at the front. The above reasons may combine as both sides agree that the mission is unnecessary. And during peacetime, one or the other side may see the mission as a detractor or threat to its procurement program.

This last consideration can be important, because the mission as described seems to demand a certain kind of plane. It must be able to maneuver close enough to the target and slow enough for the pilot to see what is supposed to be hit, and in turn hit it. Since this may take time, and the soldiers may want more than one attack, it needs good fuel endurance (known in the parlance as loiter capability) and the ability to carry an abundance of weapons. It needs durability—the ability to withstand the hits from small-caliber antiaircraft cannon and small arms fire that inevitably accompany this mission. It need not be a high performance plane carrying the most advanced radar and avionics gear. In other words, it is best that the plane remain simple and easy to maintain. Technological complexity for its own sake increases cost and maintenance demands, and also creates more machinery to break if there is combat damage. It is also possible that the plane may operate from less developed air bases near the front, where extensive maintenance facilities might not be available. And though one does not want to accept losing many planes, one does not need expensive planes in this dangerous arena. As will be seen, wars throughout the Air Force's existence called for such a plane.

### The Story

The wars called for such a plane because the Air Force often did not have one when they started. This was because its leaders shunned the mission for a variety of reasons, some of which have already been identified in the previous description's details. They thought CAS was too difficult, too costly, too passé, or too low a priority in the combat or budget strategy. To some of these officers, accomplishing the mission also risked subservience to the Army, of which the Air Force was once an obstreperous part.

In fact, when the airmen were part of the Army, they dabbled with CAS and even had dedicated ground attack planes--but not for long. More attractive were strategic bombing and interdiction with multi-engine bombers. The airmen believed these missions were more productive and less dangerous than air support with single-engine attack planes, which performed poorly anyway. Further, their budget and doctrinal struggles with the Army left them with a strong desire to prove the independent importance of their own warfighting discipline. They also never forgot how the ever-fickle defense budget directly affected how well they could achieve their aims, and thus developed an eye toward the fiscal main chance for their favored missions and planes. This included a disciplined presentation of aims via a well-orchestrated public relations campaign. Anything, like CAS, which detracted from the most important tasks, was shunned.

One might say that the Air Force's reluctance to concentrate upon CAS was justified, given the previous section's enumeration of its difficulties. But as the joke introducing the section implied, the mission was attractive to Americans. It suited the American desire to sacrifice firepower instead of citizen-soldiers' lives in foreign wars. This the airmen learned during World War II. They had to develop CAS procedures and mostly used either obsolete fighters or reassigned frontline fighters for the mission. The star plane for the role was the P-47, a rugged fighter with heavy firepower.

The lesson did not go very far. The independent Air Force that formed after World War II was dominated by bomber leaders who thought the war proved the military preeminence of strategic bombing. They shunned air support, but that did not matter in the sense that many tactical aviation leaders did not care much for the mission either. Their lesson from the war was that front-line fighters could perform CAS as an afterthought when there were not more important things to do. They forgot the training and preparation required to do the job right, as well as the fact that World War II fighters were still pretty slow and had good fuel endurance compared to the jet fighters coming on the scene.

Korea again brought the new service back to CAS. Its jets' performance generated complaints by Army generals who remembered better air support in World War II, and

expected it. One of the Air Force planes that pleased the soldiers with its CAS capabilities was the World War II-vintage fighter, the P-51--though its air support performance in that previous war was not as good as the P-47 (which by the Korean War had already been retired from service). The Navy and Marines' A-1 propeller-driven attack plane also did well, and combined with the Marines' more dedicated CAS effort, provided a stark contrast to the Air Force's efforts.

Again, the service came away from a war shunning the CAS lessons the war provided. The 1950s New Look defense policy continued to emphasize strategic bombing, and the organization assigned to develop tactical aviation, Tactical Air Command (TAC), mostly aped the bombers in emphasizing nuclear strike missions. The supersonic jets in TAC were called fighter-bombers in the World War II tradition, but their pilots seldom practiced CAS and other tactical missions. Disgusted with the Air Force's neglect of a mission that it agreed to fly when it became an independent service, Army officers turned to a new aviation technology, the helicopter. It did not take long for the Army to see that helicopters could be used in the close support role.

President John F. Kennedy's election in 1960 introduced Department of Defense staffers who not only supported the Army's helicopter development ambitions, but also disapproved of the Air Force's strategic bomber emphasis. Defense Secretary Robert McNamara and his staff wanted the Air Force to build up its tactical forces and purchase less expensive attack planes. Until America's involvement in the Vietnam War escalated, the air leaders fought a two-front bureaucratic war against the Army's push for its own helicopter air force and McNamara's attempts to change their aircraft procurement policies.

Once again, the service found itself unprepared to render close air support when needed. And though it developed a very responsive system using a variety of planes, one of its star CAS planes was the A-1 that the Air Force had to procure from the Navy. At the same time, the Army more actively pursued purchase of specially built attack helicopters to support its troops in Vietnam. It even started development of an advanced model which, if successful, would match many characteristics of fixed-wing planes. This development, and the added embarrassment of a congressional hearing criticizing the Air Force's lack of preparation for air support, led the service's top leadership to see that it might actually lose its charter and associated funds for the CAS mission.

After directing purchase of a Navy jet attack plane, the A-7, Air Force Chief of Staff General John McConnell in 1966 ordered procurement planning for a dedicated CAS plane project, called the A-X. This was the first and only dedicated CAS plane that the Air Force bought in its existence as a separate service. However, the plane's decade-long gestation was not an easy process. Only a fortuitous combination of influences enabled it to proceed from concept stage to its operational debut as the A-10 in 1976. During that period, Army interest varied according to the fortunes of its own advanced helicopter project, as well as to changing defense priorities as the Vietnam War ended. Congressional support likewise depended upon changing attitudes about defense spending, aircraft manufacturer constituents, and war-driven attitudes about the promise of this type of plane. Facing opposition from various sides, the Air Force's top leadership now found new enthusiasm for the mission and the plane. Enthusiastic staffers from both the Office of the Secretary of Defense (OSD) and the Air Force Pentagon Headquarters also helped. They ensured that the design specifications for the plane incorporated lessons learned from CAS in previous wars. Additionally, outside pressure to terminate the project and the Air Force's own decision to keep it on a budgetary back burner meant that it met both cost and performance goals. The result was a rugged plane with a huge internal gun, good external weapons carriage capability, and excellent loiter ability. It also was a simple, relatively inexpensive plane that was easily maintained and able to fly from short runways.

Challenges to the plane's viability continued after it became operational in 1976, but a new spirit of air support cooperation between the Army and the Air Force meant that the plane met these as well. Later developments in the 1980s were more serious. The Army embraced a new warfighting doctrine in which the soldiers wanted interdiction more than CAS from the Air Force. Further, the soldiers were more confident of their own ability to handle enemy forces on the front lines in future wars. This included faith in better weapons, such as the Army's advanced attack helicopter, the Apache. Air Force leaders not only agreed with the Army's change of doctrinal course, but they also used it to claim

that the A-10 was obsolete, and that a new high performance fighter, the F-16, was its replacement.

The petite F-16 did not appear to embody any of the optimum performance characteristics for CAS, but the service claimed that a new CAS definition—an oxymoronic one since it emphasized interdiction—meant that sleek fighters like the F-16 were best suited for CAS. This sparked a hot debate in the defense press and a bitter struggle within the Department of Defense between CAS F-16 supporters and those favoring an A-10 replacement that improved upon that plane while retaining its CAS attributes. As the 1980s ended, Congress once again became involved, forcing the service via various punitive measures to reconsider its tack. However, what compelled the Air Force to heed the critics was the budgetary drawdown accompanying the Cold War's end. Between the outside pressure and the realization that it could not have all of its desired F-16s, the service agreed to keep a certain number of A-10s. The 1990 Desert Shield mobilization which demonstrated the need for CAS planes, and the ensuing Desert Storm conflict which established their effectiveness, confirmed this action's wisdom.

### <u>Aims</u>

This is not only a story about an airplane. It is about technology in general: its promise and its realities. It is about the way Americans tend to fight their wars, and how this makes a very difficult mission compelling to this nation and its military services. Concerning military services, it addresses the history of the U.S. Air Force--an organization which, one would think, should embrace this mission as part of its very charter, and for which there were several interservice agreements pledging that it would do so. And as for interservice agreements, it tells of an often recriminatory relationship with the supported service, the U.S. Army. There was the background of the airmen's struggle for both status within and independence from the soldiers, the ensuing rivalry between two separate services, the Air Force's often haughty proclamations of its warfighting superiority, and then periods of close collaboration. All of these affected the CAS mission and the plane dedicated to it. They also brought in a set of actors--the members of the U.S.

Congress. Any history of service force structure and weapons procurement must include this diverse and seemingly fickle body, for through its power of the purse, it controls the acquisition and development of, as well as training with, any military technology. And this returns to the technology theme. The introduction of new aircraft, or readaptation of other planes for air support, changed how the various actors viewed the mission.

As such, the work follows some previously trod academic paths and takes some new ones. Several technology history works detail the complexities involved in developing technological devices or processes, and this work will add to those. Further, many books about military technology history also point out the complexities that vexed weapons inventors and military services alike. These especially apply to accounts of military jet procurement, and Charles Bright's <u>The Jet Makers</u> is a good example. In describing the foundations for the CAS plane's creation, as well as its later fortunes, this work also contributes to the picture of aircraft technology development as a difficult process.

However, one sometimes sees accounts that describe the difficulties well enough, but then attribute simplistic motives to the military leaders. Fine accounts of Air Force bomber procurement such as Michael Brown's <u>Flying Blind</u> and Nick Kotz' <u>Wild Blue</u> <u>Yonder</u> detail the complexity of the process; but they tend to depict the Air Force leaders as irrationally wedded to the bomber concept. Air Force leaders are guilty of following certain technologies too closely, and this work will also criticize them for it. However, it also will explain the intricate foundations for their actions and attitudes, so that even if one does not accept them, one can at least better understand them.

Political scientists sometimes study how organizations become wedded to certain technologies and associated processes. This study examines from where, as well as how and why, certain planes and missions acquired influential supporters. Some writers focus only upon constituencies within a particular service, but most show that military technologies have supporters from various walks of life--this work emphasizes the latter. For example, the Air Force had outside support from congressmen and elsewhere for some of its sweeping airpower claims. Also, the CAS plane's constituency was an eclectic hodgepodge of people and institutions.

The author is on more undeveloped ground when discussing the ironies of technological development. One aspect of "irony" in this case is the unintended consequences or uses of technology; the author is fascinated with how the uses and effects envisioned for a device or process by its creators often differ from its eventual use. This particular feature has received academic attention; and two examples are Ruth Schwartz Cowan's More Work for Mother and Edward Tenner's Why Things Bite Back. However, the author not only describes this kind of irony in the CAS plane case but also recounts situations where certain actors literally wanted one result and instead got the opposite. Even further afield is what could be called performance niches in technological progress. If most inventions are intended to facilitate, accelerate, or ease some human action, devices considered old or behind the leading wave of technological advance can still be quite useful in their own way. An everyday example is the facility of using the telephone, an "older" technology, to talk to someone instead of using the "new" e-mail technology. In air combat technology, the A-10 was a step backward performance wise, considering the capabilities of modern jets; but the nature of CAS dictated this setup. Finally, irony involves what some call myth debunking. In this case, several common assumptions about the A-10's past did not survive scrutiny. One might say that this is not technological irony so much as it is the result of historical research; but the author believes that technological developments often create situations that defy assumptions.

This work wanders into more sparsely tracked, and perhaps risky, technology history terrain in assessing the intentions and results of official studies--many of them considered scientific and unbiased. The author's point is that Mark Twain's "lies, damned lies, and statistics" quip applies to many of these, and the historian must be careful when citing them. John Tetsoro Sumida's <u>In Defense of Naval Superiority</u> covers something similar when describing the gunsight design rivalries accompanying British battleship development at the turn of the twentieth century. However, to a greater extent than Britain's battleships, modern military aviation technology is so complex that even honest premises for analyzing an aircraft's performance must themselves be analyzed. Further, these cases feature a heady mix of concerns for money, job security, professional

reputations, and national security, so everyone involved has an opinion which usually appears in the plans or results. The author will point out that many of the studies and tests that accompanied CAS plane creation, development, and later controversy often were intended to prove a point, not necessarily to get at the "truth." This involves not only the military's studies, but also a host of others.

Of course, this is mostly a study of American military history; and as such, it will follow many other observers--Russell Weigley most prominent among them--in describing an "American Way of War." This thesis states that, when American forces face combat obstacles, they strongly prefer firepower solutions to sacrificing soldiers. Their concern for citizen-soldiers, ample access to resources, and faith in technology make them want, in the words of some Army observers, to "send the bullet before sending the man." The author notes that this "American Way of War" observation does not mean that American generals never conducted brilliant, economy-of-force, campaigns; or that American troops never made serious sacrifices. The main research trip for this work led back east, and the author had time available to look at some Civil War battlefields. The Shenandoah Valley is a monument to Stonewall Jackson's dazzling campaigns. One cannot fail to wonder at the sacrifices made in the Antietam Cornfield on 17 September 1862. When the stakes are high enough and certain conditions or people converge, Americans do these things. However, they tend-especially in foreign wars where national survival is not seriously threatened--to use their access to abundant firepower rather than their soldiers' lives.

This work will demonstrate that CAS is an example of the American way of war because it is a firepower solution to the soldiers' battlefield problems. Americans use CAS more than any other national air arm in spite of difficulties encountered in practicing and accomplishing it. Indeed, other nations' air arms see American CAS as a demonstration of the nation's wealth and extravagant use of resources.

The author also believes that the U.S. Air Force should embrace CAS better than it has historically done. Its leaders often agreed with their foreign counterparts in shunning the mission. CAS and any plane dedicated to it seemed a distraction of resources from more important and desirable missions. Further, they dismissed CAS because of their memory of the struggle for independence and funds, as well as their belief that World War II proved their ability to discern aviation technology trends. They saw the mission as a wasteful diversion of their procurement budget to obsolete airplanes, and their training and combat resources to an unproductive mission. Ironically, they also followed the American firepower solution philosophy, just on a grander scale. Missions like strategic bombing and interdiction seemed more lucrative and ultimately less costly in American lives.

However, the American approach to its wars always drew Americans back to the mission and its planes. It was not just this warfighting orientation; it was also the nature of modern American foreign policy. The nation faced different warfighting arenas and scenarios; many of these required airborne firepower to assist ground war efforts. This situation continues, and it is high time the nation's premiere air arm realized it.

For that matter, the Air Force also needs a dedicated CAS plane. Just as wartime demands forced the service to fly CAS, so they also forced the service to purchase planes suited to the mission. As will be seen, Air Force leaders continue to insist that high performance fighters and pilots can successfully perform CAS in their spare time, and cite the air support use of P-47s and P-51s in World War II as the example. This work points out the problems with that assertion via the ensuing American wars that drove the service repeatedly to use planes that were better suited to CAS. Its continued use of A-10s in the world's hot spots is further proof. It also guarantees that there are Air Force pilots available to practice this difficult mission on a routine basis.

These last points about CAS are where the work moves along the least academically travelled ground. During the early-1970s CAS plane controversy, a RAND study by Alfred Goldberg and Air Force Lieutenant Colonel Donald Smith recounted Air Force-Army relations concerning CAS. Obviously, the study's account ended long before the A-10 became operational. There is a fine anthology from the Office of Air Force History, edited by Benjamin Franklin Cooling, called <u>Case Studies in the Development of</u> <u>Close Air Support</u>. It features essays about CAS in various wars, and though the author does not agree with some of the essays' findings, they are sufficiently well written to rate frequent citation in this work. However, they cover only selected wars, and do not address the post-Vietnam U.S. Air Force CAS plane program at all. Air Force and Air and Space Museum historian Richard Hallion's <u>Strike from the Sky</u> addresses air support up through World War II. This effort, written at the height of the hot 1980s debate over CAS planes, advocates the Air Force leadership's opinion about high-performance fighter CAS. Indeed, Hallion extrapolates the World War II experience into a set of maxims that he applies to CAS experiences after that war. The author *will* discuss this book, for it is almost a stand-alone example of the service's thinking during the debate. These efforts represent the best or the most comprehensive of serious works focusing upon U.S. Air Force CAS; and in order to better portray the Air Force's thinking on the mission, this work takes a more sweeping view, chronologically.

As for the Air Force CAS plane itself, there are some good works, but none that tackles the issue in its entirety. Two Air Force Systems Command histories, <u>The A-X</u> <u>Specialized Close Air Support Aircraft: Origins and Concept Phase, 1961-1970</u>, and George Watson's <u>The A-10 Close Air Support Aircraft: From Development to Production</u>, <u>1970-1976</u>, mostly address the technical details of the A-10's creation, and do not deal with larger issues. Aviation writer Bill Sweetman's <u>Modern Fighting Aircraft: A-10</u> (part of a series of "coffee table" books on warplanes) does well in describing design details and addresses some larger influences. However, some of his observations on the latter are incorrect, and the book ends with the early 1980s. Finally, William Smallwood's <u>Warthog</u> uses extensive interviews with Desert Storm pilots to render an excellent account of the A-10's Gulf War performance, but Smallwood primarily focuses upon that war.

Therefore, this work addresses the full background of the Air Force CAS plane, using as introductory chapters the CAS mission's birth during World War I and the fortunes of the U.S. Army's airmen before and during World War II. It then recounts the newly created Air Force's experience with the mission and the factors that led the service to procure a plane specifically built for CAS. Then it traces this plane's rather turbulent fortunes, including the late-1980s debate about CAS planes that in turn requires some prior review of Air Force CAS history. Indeed, other than defense journal articles, there is no previous academic study of the period when the plane became operational and then encountered further opposition. In all, this is a much more sweeping study of the U.S. Air Force, CAS, and the CAS plane than ever before presented. In so doing, the author hopes to demonstrate that military technology has complex developmental underpinnings. It will also show that the Air Force needs a dedicated CAS plane in order to accomplish a mission that Americans historically believe is necessary.

### **Caveats**

There is the tricky effort of defining CAS for this work. As one will later note, the actors involved sometimes changed the definition for some reason, and even many experts never agreed exactly upon what it was. The author uses the following definition: It is an air attack against enemy forces in and around the battlefield, and that it requires close coordination between air and ground parties before the aircrew can expend ordnance. Even this definition can invite carping. What does "in and around the battlefield" mean? If one wants a specific, unvarying distance behind the front line, then one waits in vain. An estimate is a maximum of fifty miles behind the front, but this changes due to the battlefield's shape and size, the enemy force's ground speed, the fire support coordination distance set up between ground and air commanders, and other fluctuating conditions. Another perspective is that CAS is not interdiction against troops and supply lines so far away that they do not require close coordination--or are at least a day's travel from the battle area. Again, one might ask what a "day's travel" is. At this, the author ventures one last attempt at an explanation, knowing that even this will not satisfy the more exacting reader. CAS is flown against enemy ground forces who are in direct contact with friendly ground forces or are near enough to be an imminent factor in a battle's outcome. In all cases, it requires close coordination between air and ground forces to ensure that the airmen accomplish the mission and do not shoot friendly troops who are nearby.

Though the author wants to present the various factors that affect military operations and weapons procurement, his effort stops short of assessing the specific motives and fortunes of all of the military aircraft companies mentioned in this work. The one exception will be the A-10's builder, the Fairchild-Republic Corporation. The others
will be mentioned insofar as they influence, or are part of, the narrative. Discussing them further risks denying the account what form that it does have. Besides, corporate interest and influence usually manifested itself in the actions of sponsoring politicians, and this work will certainly discuss those people.

The desire for narrative length and coherence also dictates that this work will address the command, control, and communication (C3) procedures for CAS only where they are germane to the narrative. This is because the CAS C3 process and technology is a very complex topic that rates further lengthy treatment. Critics may say that this ignores the essential part of CAS--the expeditious direction of planes to the proper target requires good C3 above all. However, this work will contend that if there are no dedicated planes to practice this all-important but difficult process, then it will not be practiced enough to be effective, if it is practiced at all. The Air Force proved this repeatedly to its own chagrin; and though it would be nice to cover the C3 side of CAS in depth, its even greater complexity is for another work. In the meantime, the history of the relationship between the U.S. Air Force and the dedicated CAS plane is story enough.

# CHAPTER II FOUNDATIONS, THROUGH WORLD WAR II

Long-term developments in, and interaction between, technology and military affairs underlay the A-10's creation. These factors in turn interacted with American foreign policy trends, as well as the influence of the American democratic process. The result of these intertwined currents was the A-10's specific mission, close air support (CAS), which stood in the middle of shifting and conflicting warfighting visions.

From just before World War I to the end of World War II, military men embraced close air support as a promising firepower augmentation. But a split occurred between ground and air officers when difficulties arose in making this mission succeed. Also, American airmen shunned the mission not only because of the difficulties encountered in World War I, but also due to their doctrinal and budget struggles with ground officers and Congress. World War II brought these men back to combat's very real exigencies, and through a slow process, they learned about air support. But they also took away several misinterpretations which would later affect Air Force CAS affairs. Finally, the atomic bomb prepared them to ignore the war's CAS lessons.

#### Close Air Support in World War I

Military officers recognized the airplane's potential for directly supporting ground troops early on. The first instance involving air attacks on enemy troops occurred in the 1911 Italo-Turkish War, when Italian planes dropped small explosives on their opponents. There were sporadic cases involving primitive air support in other world clashes, but World War I offered greater opportunities to support troops, especially after the stalemate on the Western Front created parallel and relatively static trench systems. To varying degrees, the American, British, and German air arms all attacked enemy combat troops. British trench strafing attacks revealed one close air support dividend, in that they hurt German morale. Troops even panicked at times. British planes also supported their own tank attacks by knocking out German antitank gun positions. Finally, air attacks against an opponent's reserves could sometimes undo his planned offensive.<sup>1</sup>

But air support encountered problems, some of which had to do with military leaders and some pilots' enthusiasm for this type of air combat. Army generals often did not understand the limitations of their new tools of war, and applied them incorrectly. Assigning the wrong type of plane to attack enemy troops, for example, yielded disappointing results and high losses. Communications between ground and air forces were rudimentary, to say the least, and included such things as revving engines, dropping messages, or deploying ground smokes and flares. The infantry did not like using the latter because these sometimes revealed their position and intentions to the enemy. Wireless radio was too primitive at this time to be reliable. These problems were not significant when the opposing lines were static, but the appearance of movement warfare at the war's end seriously hindered attempts to provide close air support to troops in contact.<sup>2</sup>

Indeed, even World War I pilots who flew slow biplanes at low altitudes had trouble specifically identifying ground troops and vehicles. As one air support expert later described, one discerns no distinguishing features of men standing in an open field beyond

<sup>&</sup>lt;sup>1</sup>Richard Hallion, in <u>Strike from the Sky: The History of Battlefield Air Support</u>, <u>1911-1945</u> (Washington, D.C.: Smithsonian Institution Press, 1989), 11-12, recounts the first use of airplanes for air support (besides the Italo-Turkish War, there were missions flown in the 1912 Balkan War, French colonial fighting in Morocco, and the Mexican Revolution). References to air support success can be found in Hallion, <u>Strike</u>, 19-20, 24; Lee Kennett, "Developments to 1939," chap. <u>Case Studies in the Development of Close Air Support</u>, ed. Benjamin Franklin Cooling, (Washington, D.C.: Office of Air Force History, 1990), 18, 20, 21 (morale effects); and Kennett's own book, <u>The First Air War</u>, <u>1914-1918</u> (New York: The Free Press, 1991), 210 (successful attacks on reserves). Air support historian Brereton Greenhous praised British airmen's support of their tank attacks in "Close Air Support Aircraft in World War I: The Counter Anti-Tank Role," in <u>Aerospace Historian</u> 21 (Summer 1974): 90-91.

<sup>&</sup>lt;sup>2</sup>Ground commanders' misuse of airplanes is from Kennett, <u>The First Air War</u>, 90-91. Signals usage is from Kennett, "Developments," in Cooling, ed., <u>Case Studies</u>, 16-17; and Greenhous, "Counter Anti-Tank Role," 89-90. And target recognition in fluid combat is from Greenhous, "Counter Anti-Tank Role," 89; and Kennett, <u>First Air War</u>, 210-212.

two-thousand feet slant range, and large vehicles such as tanks can be hard to recognize beyond five-thousand feet--much closer if any camouflage or obscuring factor such as dust or bad lighting is present.<sup>3</sup> Throw in the speed and stress of combat flying, as well as the time and distance required to achieve a firing solution, and the problem becomes greater. And in the stress of combat, what people on the ground believed was a grossly obvious visual feature was not so obvious to a pilot struggling to line up and hit the *correct* target. Thus, a ground commander might want air support; but if his troops' positions fluctuated or intermixed with those of the enemy--and then they could not tell the airmen these details--the pilots sometimes mistakenly shot their own people or did not fire at all.<sup>4</sup>

As the war continued, other problems surfaced. Veteran troops lost their fear of the new weapon as commanders trained them to remain firm and fire back at attacking planes. Pilots specializing in ground attack became committed to the soldiers they supported and took serious risks to help them. With one exception, extant records indicate that ground support units on all sides experienced above-average losses. During the Battle of Cambrai, British trench strafing squadrons suffered 30 percent casualties daily. The belligerents' air arms did not abandon air support; instead they looked for an airplane type that could do the mission and survive. The best solution seemed to be single-engine, two-seat biplane with reasonably high speed and good armor protection.<sup>5</sup>

<sup>4</sup>LTCOL John Collins, Connecticut Air National Guard (ANG), "Close Air Support: Another Look" (Military Studies program paper, U.S. Army War College, 1989), 22-23; and Davis, Greene, and Deitchman, "Don't Take the Low Road," 20.

<sup>&</sup>lt;sup>3</sup>Harry Davis, Terrell Greene, and Seymour J. Deitchman, "Tactical Air Warfare: Part I: Don't Take the Low Road," <u>Aerospace America</u> (August 1986): 20 (details difficulties involved in CAS); Hallion, <u>Strike</u>, 23; COL J. Hunter Reinburg, USMCR, "Close Air Support: The Mission and the Weapons System," <u>Army</u> 12 (April 1962): 60 (the "expert"); and U.S. General Accounting Office, <u>Close Air Support: Principal Issues</u> <u>and Aircraft Choices</u>, Report to the Chairman, Appropriations and Armed Services Committees, Congress of the United States, (Washington, D.C.: Government Printing Office [GPO], 1971), Attachment III, 62-63.

<sup>&</sup>lt;sup>5</sup>Hallion, <u>Strike</u>, 21; Kennett, "Developments," in Cooling, ed., <u>Case Studies</u>, 23. The one exception to the heavy losses in World War One CAS comes via <u>Air Power</u> <u>Showdown, Part III: The Best Attack Aircraft</u>, produced by <u>Aviation Week & Space</u>

Whatever the type of plane, air leaders came to believe the most productive ground support occurred when airplanes attacked rear-echelon forces. In such a case, troops and vehicles were obviously the enemy, and they were often not as well defended as those on the front lines. The Americans particularly embraced this idea.

### The Fortunes of the U.S. Army's Airmen and Close Air Support from 1918 to 1941

The U.S. Army Air Service (the name for the "air force" in the early days) commander in World War One was Brigadier General William "Billy" Mitchell, who strove during the war to meet army needs. Most notable was his pilots' support of the American offensive at St. Mihiel, though most of their missions struck German positions behind the front lines.<sup>6</sup> Soon after the war, Mitchell and other air leaders such as Major William Sherman developed air support guidelines that reflected the prevailing perceptions of wartime air support results, as well as the capabilities they envisioned in future aircraft. Though there was some previous disagreement over whether the best ground support occurred at the point of contact or behind the lines, by 1923 a Chief of the Air Service attack doctrine study preferred the latter. As for direct support of troops in contact, its authors believed this should occur only in "extreme" circumstances. Reports on air-ground maneuvers in 1926 stated that future attack aircraft required speed and agility to evade the pursuit fighters lurking behind the lines. This was a change from the idea of the armored attack plane some services used in World War I.<sup>7</sup>

<sup>6</sup>Ibid., 42-43.

<sup>&</sup>lt;u>Technology</u>, 60 min. Aviation Week Group, 1997, videocassette. In this production, World War One aviation historian Peter Grosz states that his review of German records reveals that the German Halberstadt CL series ground attack planes experienced relatively fewer losses than other German aircraft types flying other missions.

<sup>&</sup>lt;sup>7</sup>Office of the Chief of Air Service, staff study, 1923, page 2, cited in MAJ Gary Cox, USAF, "Beyond the Battle Line: US Air Attack Theory and Doctrine, 1919-1941," (Master's thesis, Maxwell Air Force Base, Ala. [henceforth, this location shall be referred to as MAFB]: School of Advanced Airpower Studies, 1996), 10. Aircraft requirements are in Report of the Office of the Chief of Army Air Service, "Maneuvers of the Army Air

From the mid 1920s through the 1930s, the Army Air Corps (the new "air force" name after 1926) faced changes that affected airmen's thinking in general and ground support doctrine in particular. Congress' postwar defense budget cutbacks particularly hurt the Army Air Corps. Much more than the rest of the Army of that time, the airmen relied heavily upon the budget to support pilot training and proficiency, as well as aircraft improvements. Army generals did not believe that the aviation technology of the time justified high budget priority, leading Mitchell and others to actively advertise the airplane's potential to an aviation-mad press and public.<sup>8</sup> There were well-publicized bombing tests on mothballed battleships, an around-the-world flight by Army planes, and Billy Mitchell's frequent public pronouncements. As the budget noose tightened, Mitchell's comments became more insubordinate, earning him a conviction in a General Court-Martial during which he further trumpeted air power's cause. Mitchell's successors likewise refused no opportunity to sell their force's capabilities: tactical exercises, more ship bombings, humanitarian efforts, flights to South America, a well-publicized bomber intercept of an

Service," 17 May 1926, 3-4, also in Cox, "Beyond the Battle Line," 12-13.

<sup>&</sup>lt;sup>8</sup>World War I American Expeditionary Force commander, General John Pershing, said as much shortly after the war; and Mitchell's antics further fixed Pershing's successors in their intransigence. See Robert Futrell, <u>Ideas. Concepts. Doctrine: Basic Thinking in the United States Air Force, 1907-1960</u>, vol. I, (MAFB: Air University Press, 1989), 35-52; and Maurer Maurer, <u>Aviation in the U.S. Army, 1919-1939</u>, (Washington, D.C.: Office of Air Force History, 1987), 119-129, 440 (These segments cover the army's budget priority, as well as the anti-ship bombing test. The Navy and Mitchell suspected each other of breaking test rules in order to score publicity points. Mitchell certainly won in that category. Also, the airmen's aims and actions, as well as the budget issue, are nicely summarized in Peter Maslowski's and Allan Millett's survey, <u>For the Common Defense: A Military History of the United States of America</u>, revised ed., (New York: The Free Press, 1994), 386-390, and 401-404.

The following is an observation from many years later, but it still points up the disparity between Army and Air Force budget requirements: "If you spend \$10 billion on an army, you modernize a whole corps. Ten billion dollars on an aircraft progamme [sic] is nothing. You could fix every problem in the Army for 10 percent of the F-22 [Air Force advanced fighter] programme." See quote of U.S. Army MGEN Garner (no first name given), in Air Vice Marshal (AVM) Tony Mason, <u>Air Power: A Centennial Appraisal</u> (London: Brassey's, 1994), 237.

ocean liner far at sea, and an abortive attempt to fly the nation's mail.<sup>9</sup> Additionally, from Mitchell's time onward, they worked with Congress to maintain political and bureaucratic momentum. The result was a series of hearings and review boards in which the airmen slowly gained status within the Army.<sup>10</sup> In all, air leaders developed a keen, ingrained, consciousness of political and publicity issues--not to mention a serious antipathy toward subservience to the Army--from this era's budget and status battles.

As such, the interwar struggle helped cement an overall doctrinal shift among most Air Corps officers. Revolted by the war's carnage and impressed by Germany's internal breakdown, Mitchell believed that a more humane and effective way to end future wars was to use various types of planes to bomb key civilian and military targets within an opponent's territory, thus inducing a collapse. The Army's actions before, during, and after the court-martial reinforced Mitchell's conviction that only an independent air force could achieve his strategic vision.<sup>11</sup> And as they endured a sparse budget, Army resistance to their plans, and the scandal of Mitchell's court-martial, the remaining air leaders remained no less committed to their fallen leader's aims. Along with proving airpower's

<sup>10</sup>Copp, <u>A Few Great Captains</u>, 44, 111-112, 137, 142, 243, 376; and Futrell, <u>Ideas</u>, vol. I, 44-48, 70-75.

<sup>11</sup>The Italian air power enthusiast Giulio Douhet's ideas about winning wars through bombing also influenced Mitchell and other Air Corps leaders, though how much is still debated. See Copp, <u>Captains</u>, 106, 319 (some influence): Futrell, <u>Ideas</u>, vol. I, 38-39 (unsure, but skeptical); COL D. G. McLennan, USA, "Close Air Support History," (Ft. Meade, Md.: U.S. Army Continental Army Command [CONARC] Close Air Support Requirements Board, 29 August 1963), 5-7 (heavy influence), photocopied, in author's possession; and Russell Weigley, <u>The American Way of War: A History of United States</u> <u>Military Strategy and Policy</u>, 2d ed., (New York: MacMillan Publishing, 1973; reprint, Bloomington, Ind.: Indiana University Press, 1977), 225-228 (unsure of influence).

<sup>&</sup>lt;sup>9</sup>DeWitt S. Copp, <u>A Few Great Captains: The Men and Events that Shaped the</u> <u>Development of U.S. Air Power</u> (McLean, Va.: EPM Publications. Inc., 1980), 47, 66, 92, 113, 126-127, 214, 393, 419; and Maurer, 131-148, 299-317, 400-412. Also, the future leader of the World War II Army Air Force, General Henry "Hap" Arnold, reminisced about Billy Mitchell's growing impatience in his "Everybody Knows How It Happened," <u>The Airpower Historian</u> 6 (July 1959): 159-172.

effectiveness, an independent service was prominent among the goals of the continued publicity stunts and political maneuvering.<sup>12</sup>

In the 1930s, aviation companies such as Boeing produced large, four-engine bombers that met the air leaders' aims for airpower-driven strategic success. Further, the new Norden bombsight promised to improve the normally inaccurate high-altitude level bombing delivery that they wanted the big bombers to accomplish. In the hothouse atmosphere of the Air Corps Tactical School (ACTS) at Maxwell Air Base, Alabama, future Air Force generals such as Ira Eaker and Haywood S. Hansell, Jr. crafted a service doctrine which envisioned invincible bombers--new models like the B-17 (for photo, see Appendix Fig. 1) were faster than most fighters of the day--striking a country's industrial vitals and bringing it to its knees.<sup>13</sup>

It was not that they completely ignored other forms of aerial attack, as is popularly assumed; they also modified how attacks on enemy troops would be conducted. The passing years and scraps with Army ground generals cemented the airmen's attitudes about World War One's air support lessons. They became increasingly skeptical about the

<sup>&</sup>lt;sup>12</sup>The airmen's separate service motivations and actions are from Copp, 47, 102-106; Cox, 21; Futrell, <u>Ideas</u>, vol. I, 52, 65; and Weigley, <u>American Way of War</u>, 224. The first U.S. Air Force Chief of Staff, General Carl Spaatz, later recalled, "I guess we considered ourselves a different breed of cat, right in [*sic*] the beginning"; see MAJ Richard Head, USAF, "Decision-Making on the A-7 Attack Aircraft Program" (Ph.D. diss., Syracuse University, 1970), 101. Head was one of the early Air Force Academy graduates, and observed that underclassmen had to memorize this quote.

<sup>&</sup>lt;sup>13</sup>For summaries of this doctrine's evolution, see Futrell, <u>Ideas</u>, vol. I, 62-66, 68-70, 78-83; and Donald Mrozek, <u>Air Power and the Ground War in Vietnam</u>: <u>Ideas and Actions</u> (MAFB: Air University Press, 1988), 7-10. A good assessment of the bomber men's dismissal of fighters is in MGEN Perry McCoy Smith, USAF (ret.), <u>The Air Force Plans for Peace, 1943-1945</u> (Baltimore, Md.: The Johns Hopkins Press, 1970), 29-33. Smith discusses how the pre-war airmen's doctrinal bias led them to believe the temporary fighter developmental lag was permanent, and quotes an ACTS slogan, "Fighters are obsolete."

morale impact that frontline attacks had upon troops--especially considering the aircraft loss rates these attacks incurred.<sup>14</sup>

Aircraft technology and beliefs concerning various design functions also changed airmen's attitudes about not only where air support should occur, but also what types of airplanes should accomplish it. The single-engine armored ground attack planes of the interwar years, such as the A-17 (for photo, see Appendix Fig. 2), were all slow and unmaneuverable. Air Corps doctrine stated, and exercises seemed to reveal, they would not survive fighter defenses during attacks behind the lines. And since the Army Air Corps did not share the Navy's enthusiasm for dive bombers-the Army airmen thought these planes were too vulnerable to fighter attacks--its attack planes were not as accurate in their low-altitude, shallow-dive weapons deliveries. (A steeper dive angle reduces the magnitude of bomb ranging error if errors in other release parameters such as airspeed, release altitude, or aiming occur. This is why the Germans favored dive bombers. Lacking a sophisticated bombsight such as the one produced by America's Carl Norden, they reduced the problem of dropping bombs either grossly long or short of the target by using steep dive technique.) To answer this problem, some officers believed that pursuit fighters should provide air support only when absolutely needed-or at least to clear out frontline antiaircraft positions for heavy bombers on strategic missions. But as bomber doctrine assumed preeminence after the mid 1930s, the Army Air Corps envisioned twin-engine, multicrewed bombers fulfilling the Army support mission. Armed with the accurate Norden bombsight, such planes would deliver heavier payloads against rear-echelon enemy concentrations in level attacks above the range of small-arms fire. Just as the big bombers would hit the vitals of the enemy's heartland, these smaller bombers would do the same to the enemy's armies. Small bomber designs became the A-20, B-25, and B-26 of World War II fame (for B-25 photo, see Appendix Fig. 3).<sup>15</sup>

<sup>&</sup>lt;sup>14</sup>Cox, 116-117; and Kennett, "Developments," in Cooling, <u>Case Studies</u>, 58-59.

<sup>&</sup>lt;sup>15</sup>Single-engine aircraft performance and the turn to bombers is from Hallion, <u>Strike</u>, 48-49; Kennett, "Developments," in Cooling, ed., <u>Case Studies</u>, 48, 51-52; Cox, 12, 20-22, 30-32, 58-59; LTCOL Daniel Fake, USA, "The Evolution of Close Air Support

The overall doctrinal approach affected attack aviation in other ways. Just as the air leaders endured a lower than desired funding priority in the Army's overall budget scheme, so they also snubbed certain of their own missions in budgeting decisions. The single-engine attack planes could have been improved, but most of the money went for better bombers. And in keeping with the airmen's faith that accurate heavy bombing would win wars, attacks on troops in contact were to be avoided because they would distract from the well-planned effort to prevent enemy forces from reaching the battlefield. To Army Air Corps planners, attacks upon engaged troops were simply not a cost-effective means of waging air war.<sup>16</sup> There was some early discussion about placing attack units under a high-ranking ground commander's--army corp commander, at least--control so they would be used to best effect. But by the late 1930s, Army Air Corps leaders felt that the theater *air* commander should have operational control, since only such an officer could competently use the air assets to achieve victory.<sup>17</sup>

Army Air Corps doctrinal beliefs in the interwar years presaged similar beliefs and actions many years later. Since the leaders believed in an air force which independently solved warfare problems by striking at targets behind the lines, they came to prefer airplane types that could defeat, or at least withstand, fighter attacks while dropping lots of bombs on army troop and logistic concentrations. Doctrine and technology interacted in this case;

Doctrine and Implications for the 21st Century," (Research paper, U.S. Air Force Air War College [henceforth called Air War College], 1995), 4; Head, "A-7," 107-113; and Matthew K. Rodman, "Flexible Air Power: The Fifth Air Force in World War II" (Master's thesis, Texas Tech University, 1998), 8-18. A source discussion of steep dive angle advantages is from Air Force A-1 attack plane pilot, CAPT Alan Rennick, testimony in Congress, House, Special Subcommittee on Tactical Air Support of the Committee on Armed Services, <u>Close Air Support</u>, 89th Cong., 1st sess., 22 September 1965, 4698; and U.S. Air Force Tactical Air Command, "Instructional Text: Manual Weapons Delivery," Course A1000IDOPN, Part One, (Nellis AFB, NV: Fighter Weapons School, October 1981), 2-3.

<sup>&</sup>lt;sup>16</sup>The Air Corps Tactical School's March 1930 air support text, <u>Attack Aviation</u>, pages 40-50, said as much; cited in Cox, 17-18.

<sup>&</sup>lt;sup>17</sup>The sources for this paragraph are Cox, 20-38, Kennett, "Developments," 46-51, 58-59 (the last pages given discuss attack plane corrective research apathy).

Army Air Corps leaders promoted the bomber designs that suited their preconceptions, while the poorly funded and poorer performing small attack planes reinforced the impression that such designs were not worthwhile. As World War II commenced in Europe and America started war preparations, Army air and ground leaders searched to replicate the air-land coordination of the German blitzkrieg tactics then stunning Europe. The efforts were ineffectual. During exercises, both air and ground commanders shared the blame for not collocating their headquarters and for making little effort to set up proper ground-air radio communications. Ground commanders wanted to use air units in limited roles within their area of responsibility. Air commanders used their planes in accordance with their doctrine, and thus took little account of ground campaign problems.<sup>18</sup>

Army errors were due to ignorance, but the Army Air Corps pursued erroneous paths in an effort to achieve self-perceived worthy aims. Future air leaders who were either students or faculty at the 1930s Air Corps Tactical School took little account of attack aviation's fortunes in that decade's wars, and when they did, they concluded that battle results proved the bomber's worth. In his graduate school history of Army Air Corps attack aviation, future Air Force Chief of Staff Ronald Fogleman summarized the airmen's attitude when he wrote that they paid "a certain amount of lip service . . . to the attack mission in order to escape the wrath of the General Staff."<sup>19</sup> Indeed, as America prepared for European operations in World War II, that war's Army Air Force (the "air force" name by then) commander, Henry "Hap" Arnold, primly replied to an exasperated ground general's complaint about lack of cooperation: "There is just so much aviation available for

<sup>&</sup>lt;sup>18</sup>Abortive exercises are from Kennett, "Developments," 52-55; and Cox, 22-24.

<sup>&</sup>lt;sup>19</sup>MAJ Ronald Fogleman, USAF, "The Development of Ground Attack Aviation in the United States Army Air Arm: Evolution of a Doctrine, 1908-1926," (Master's thesis, Duke University, 1971), 90. Sources for previous sentences about 1930s wars' lessons are Cox, 30-31; and Kennett, "Developments," 45-46, 59-60. Kennett writes that the Army Air Corps ignored the Marines' air support setup in Nicaragua, apparently because the Army airmen thought that the type of fighting seen in Nicaragua was an anomaly in modern war.

cooperative training . . . with the Army Ground Forces."<sup>20</sup> The result was an air arm which was ready to conduct the interdiction mission during World War II, but as one student of this era's air support put it, was "inadequately prepared when called upon to provide direct support to the ground forces."<sup>21</sup>

### The Army Air Force's World War II CAS Lessons and Perceived Lessons

The Army Air Force got its first chance to support a serious ground campaign during the North Africa campaign in 1943. After several months of combat, the airmen gained a significant victory in that they established equality for themselves in the command structure, and thus managed to wage a theater campaign which secured air superiority. This change in status occurred because Army subordinate commanders misused the airpower assigned to support their particular units.

One observer of America's North African campaign wrote that its problematical outset was due, as it often is in close air support, to the differing perceptions between airmen and soldiers. The soldiers did not think they received good air support unless they actually saw their planes attacking targets, and they were much more disappointed if enemy planes attacked them. For example, German Junkers Ju-87 Stuka dive bombers caused only one-twentieth of the American combat casualties suffered in the European theater, but American troops ranked the Stuka (for photo, see Appendix, Fig. 4) fifth among nine German main battle weapons they considered most threatening.<sup>22</sup> However, this was why

<sup>&</sup>lt;sup>20</sup>GEN Henry "Hap" Arnold, USA, letter to MGEN Jacob Devers, USA, 5 September 1942, quoted in Kennett, "Developments," 56. COL Paul Robinette, serving on the U.S. Army General Staff early in the war, thought Hap Arnold was too wedded to strategic bombing doctrine to be aware of other air combat needs (cited in Kennett, "Developments," 60).

<sup>&</sup>lt;sup>21</sup>Cox, 40.

<sup>&</sup>lt;sup>22</sup>"Observer" is David Syrett, "The Tunisian Campaign," in Benjamin Franklin Cooling, ed., <u>Case Studies</u>, 155. Stuka statistic is from Roger Beaumont, <u>Joint Military</u> <u>Operations. A Short History</u> (Westport, Conn.: Greenwood Press, 1993), 106.

the airmen resented Army ground commander interference. To them, the most important objective was to gain air superiority which prevented enemy air attacks and *then* allowed one's own air force to perform air support. Air operations conducted under some ground general's control risked diverting the air effort away from this essential task to tasks involving his own unit. Given this attitude, many American soldiers doubted the Army Air Force's capacity and willpower to conduct close air support.<sup>23</sup>

The problem with perception, use, and operational structure climaxed in Tunisia when Major General Lloyd Fredendall mishandled his II Corps and the air units assigned to it. The Army instruction regarding air support, Field Manual (FM) 31-35, still apportioned tactical air units—light bombers, fighters, and such--to a theater commander's subordinates, the corps and division commanders. The airmen did not like this arrangement from the start of the African campaign, for they felt that it left airpower to be "frittered away in penny packets." All of the American ground commanders were guilty of this practice, as they held fighter planes under their command and thus denied the airmen the ability to mass against German air attacks. But under Fredendall, air leader protests reached fever pitch when the II Corps commander denied air support to Free French forces in another sector in order to support one of his own, unopposed, operations. Fredendall continued this practice, and greeted air leaders' entreaties with loud, often erroneous, complaints about how German planes repeatedly mauled his forces.<sup>24</sup>

The airmen won the day with an appeal to Allied Forces Commander, General Dwight Eisenhower, at the January 1943 Casablanca Conference, as well as through Fredendall's February defeat at the Battle of Kasserine Pass. The mid-1943 creation of Field Manual 100-20, <u>Command and Employment of Air Power</u>, codified their victory by declaring that air units would be assigned to an air commander who served equally with a ground commander underneath the theater commander's control. It also spelled out the

<sup>&</sup>lt;sup>23</sup>Hallion, <u>Strike</u>, 175-176; and Syrett, 157.

<sup>&</sup>lt;sup>24</sup>Syrett, "Tunisian Campaign,"162-170. The quote is from Air Vice Marshal Arthur Tedder, RAF (Syrett, 167). Though Tedder was British, American air leaders made similar observations.

Army Air Force's mission priorities: first came air superiority, then interdiction, and last, close air support. Many people then and later considered FM 100-20 to be the airmen's declaration of rights or independence, and so indeed it was. Close air support was not a prominent mission for the rest of the North African campaign; and it was nearly non-existent in the ensuing Sicilian campaign because, as one historian put it, the air leaders were intent on exercising their new prerogatives.<sup>25</sup>

This period is important because of the way in which future air and the ground leaders remembered it. The 1993 U.S. Air Force Air War College text lessons addressing the North African campaign claim that the airmen kept a bad situation from getting worse by their actions, and to a good extent they are right. When ground commander selfishness would not let the airmen meet their enemy on equal terms, the airmen suffered high losses, and the Germans strafed and bombed American troops anyway. The reorganization permitted a concerted campaign against the Germans' air bases and supply lines which greatly reduced their air activity and isolated their ground units. Once the American soldiers gained more experience and achieved better organization, they mastered the German units they faced at the front.<sup>26</sup>

<sup>26</sup>Three assigned readings in the U.S. Air Force Air War College Associate Programs Military Studies Course (MS 610AP), Volume I, 4th edition (MAFB: Air University, 1993; henceforth known as Air War College Text) hammer home these lessons and results. They are MAJ Michael Wolfert, USAF, "Misapplication of Air Power in North Africa," 287-294, reprinted from MAJ Wolfert's Air Command and Staff College Student Report #88-2800, April 1988; GEN Laurence Kuter, USAF (ret.), "Goddammit, Georgie!", 295-299, reprinted from <u>Air Force Magazine</u>, February 1973, 51-56 (Kuter was one of the North Africa Army Air Force commanders, and he angrily refutes conceptions of airpower's North African failures as portrayed in the award-winning movie, <u>Patton</u>); and LTGEN Elwood "Pete" Quesada, USAF (ret.), "Tactical Air Power,"

<sup>&</sup>lt;sup>25</sup>Hallion, <u>Strike</u>, 167-179; McLennan, "Close Air Support History," 20-25, Tab A to Annex A-pages 1-2 (details commanders' complaints about lack of CAS in Sicily; Futrell, <u>Ideas</u>, vol. I, 137-138; Syrett, 170-175, and 184-185; and Alfred Goldberg and LTCOL Donald Smith, USAF, "Army-Air Force Relations: The Close Air Support Issue," RAND Project Air Force Study #R-906-PR (Santa Monica, Calif.: RAND, October 1971), 3-4, for FM 100-20's development. Alan Wilt, in his "Allied Cooperation in Sicily and Italy, 1943-1945," in Cooling, ed., <u>Case Studies</u>, 199-201, discusses the reasons for lack of air support in Sicily.

But one conception that became the stuff of dogma in later years involved an extrapolation from doctrinal preferences to aircraft procurement. During the times when Allied planes could not properly muster against German fighter formations, getting caught airborne in a poorly performing machine by enemy fighters could be fatal. The mission commander of the infamous October 1943 Schweinfurt raid, in which one-third of the attacking B-17 force was shot down, later remembered his feelings about being outnumbered and outperformed by enemy fighters over hostile country. And though his experience involved bombers on raids deep into Germany, it still revealed the unforgettable sensation of helplessness when facing a superior enemy airborne:

I suppose this feeling of being caught in a hopeless situation is far from new .... I think of the Middle Ages. I see myself strolling across an open plain with a group of friends. Suddenly we are beset by many scoundrels on horseback .... We cannot run, we cannot dodge, we cannot hide—the plain has no growth, no rocks, no holes. And it seems endless. There is no way out, then or now.

And such cases did occur during air support missions; in one, the RAF lost an entire squadron of slow attack planes in North Africa when a ground general sent them unescorted gains heavy fighter defenses. Future U.S. Air Force tactical airpower leaders such as William Momyer were fighter leaders in North Africa, and not only did they want the mission priorities set forth in FM 100-20, but they much preferred planes that won

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<sup>311-314,</sup> reprinted from <u>Air University Quarterly Review</u>, Spring 1948, 37-45 (Quesada was the acclaimed proponent of air support of army operations, but his article asserts that a balanced air campaign is vital).

Besides the Air War College readings are other accounts and personal examples. Syrett's North Africa history in Cooling's <u>Case Studies</u> uses air leaders' documents in endorsing their position. Tactical Air Command chief GEN William Momyer described North Africa in the same way in his article, "Centralized Control of Airpower," in <u>Supplement to the Air Force Policy Letter for Commanders</u>, #4-1973 (Washington, D.C: Office of the Secretary of the Air Force, April 1973): 30. And an Air University research publication during the late-1980s CAS plane debate presented North Africa in a similar vein; see LTCOL Harold Gonzales, USAF, <u>Tactical Air Support of Ground Forces in the</u> <u>Future</u>, Research Report #AU-ARI-89-7 (MAFB: Air University Press), 26-33.

fights against enemy air while also supporting the troops.<sup>27</sup> Other commanders would also embrace this concept as conventional wisdom, but the truth was somewhere in between. P-40 Warhawk fighter planes flew air support missions in North Africa (and in Italy, and some even later in France; for photo, see Appendix, Fig. 5), though the Army Air Force regarded them as obsolete air combat machines. They continued in service because other fighters seized air superiority and protected them. The situation was not that fighters defeated enemy interference while simultaneously performing air support missions.<sup>28</sup>

An historical corollary to this belief concerned the fortunes of the Germans' Stuka dive bomber. A slow, ungainly plane capable of good bombing accuracy, it achieved great notoriety supporting the German ground advance through Poland, the Low Countries, and France; but it suffered heavy losses flying interdiction missions against tough fighter

<sup>28</sup>COL Walter Boyne, USAF (ret.), <u>Clash of Wings: Air Power in World War II</u> (New York: Simon & Schuster, 1994), 170, and 178 (in this acclaimed survey of the air war, the equally acclaimed Boyne asserts the P-40 was obsolete *before* the Americans arrived); and Syrett, 168, 176-177, and 212-213. Author's telephonic interview with former North Africa P-40 pilot and later Air Force Pentagon CAS plane project staff officer, COL Ray Lancaster, USAF (ret.), 18 April 1997, recording and notes in author's possession, reveals that the P-40 could defend itself if pilots used good tactics. Lancaster shot down three Messerschmitt ME-109 fighters.

<sup>&</sup>lt;sup>27</sup>Momyer's views are courtesy of GEN William Momyer, USAF (ret.), personal interview by author, 29 April 1997, Washington, D.C., notes in author's possession; and Mrozek, Air Power and the Ground War in Vietnam, 22-24. Quesada also alludes to air warfare pitfalls and aircraft preferences in the Air War College reprint. Richard Hallion presents five decades--but mostly relies on the World War II experience--to present accumulated Air Force "wisdom" asserting that the multirole fighter is the only viable air support option. See his Strike, 50-51, 263-271; and his "Battlefield Air Support: A Retrospective Assessment," Airpower Journal 4 (Spring 1990): 20-21, 25. Aviation author Bill Sweetman discusses the multirole school in the opening pages of his A-10 study, Modern Fighting Aircraft: A-10 Thunderbolt II (London: Salamander Books, 1984), 4-5. In reviewing the debate over single- versus multirole fighters in his 1972 Air Command and Staff College Research Study, MAJ Thomas Barnes, USAF, observes that military analysts considered the P-51 "as supporting the case for developing multipurpose fighters": see Barnes, "A Concept for Tactical Fighter Design: The Case for Single Purpose Aircraft," (1972), 16. B-17 bomber commander quote is from COL Budd Peaslee, USAF (ret.), quoted in Martin Caidin, Black Thursday (New York: Ballantine Books, 1960), 159 (book is about the Schweinfurt raid).

defenses during the 1940 Battle of Britain, and had to be removed from that fight. Nonetheless, it still provided good air support in various campaigns where the Allies could not or would not venture into the battle area to contest air superiority: the German invasions of Mediterranean countries and islands, the early North Africa campaigns, and especially the Eastern Front for most of the war. But what American airmen remembered was the Stuka's Battle of Britain fiasco, and they spent the rest of their careers fighting the purchase of any plane that could not hold its own against enemy fighters. To them, the Stuka's weaknesses were magnified by the fact that it was limited to one mission and one situation: battlefield air support with limited to no fighter opposition. Never mind that such a situation prevailed on the Eastern Front because Soviet fighters refrained from venturing into the rough-and-tumble battlefield arena, thus allowing Stukas to continue operating to war's end. Nor did they recall, or apparently want to recall, that other World War II air forces successfully used aerial combat "clunkers" such as the P-40, Illyushin IL-2 Shturmovik, and Douglas SBD Dauntless for ground support (for photos of IL-2 and SBD, see Appendix, Figs. 6 and 7). And though the Stuka did not attack American soldiers after the Normandy invasion, neither did German fighters-such was the Allies' aerial preeminence at that time. The Army airmen only saw that the plane was a limited capability asset, and preferred fighters that they believed would always excel in a variety of roles 29

<sup>&</sup>lt;sup>29</sup>The many sources for the Stuka's performance provide somewhat diverse assessments. See Edward Bavaro, Threat Branch, Directorate of Combat Development, U.S. Army Aviation Center, "Tank Busters," <u>U.S. Army Aviation Digest</u> (henceforth known as <u>USAAD</u>) 31 (June 1985): 3-4 (likes its antitank capability but dwells upon its aerial vulnerabilities); Boyne, <u>Clash of Wings</u>, 34-35, 59, 75, 80, 146, 174, 178-179, 385 (calls the plane "infamous," but praises Rudel); William Green, "The Junkers Ju-87," chap. in <u>Famous Bombers of the Second World War, Volume One</u> (New York: Doubleday and Company, 1959), 37-46 (writes that it still could provide support in many situations after its Battle of Britain failure); Hallion, <u>Strike</u>, 49, 146, 239 (sees proving the folly of dedicated attack planes); Robin Higham, <u>Air Power: A Concise History</u> (New York: St. Martin's Press, 1972), 101, 106, 138, and 143 (similar observations as Green); Ian Hogg, <u>Tank Killing: Anti-Tank Warfare by Men and Machines</u> (New York: Sarpedon, 1996), 208, 211-212; Williamson Murray, "The Luftwaffe Experience," in Cooling, ed., <u>Case</u> <u>Studies</u>, 71-113 (emphasizes Stuka's increasing weakness throughout the war as the

As for the Army, one official Army study after the war claimed that some of its ground unit leaders viewed FM 100-20 with "dismay." They wondered if the airmen

Germans failed to improve upon the design); CAPT Lonnie Ratley, USAF, "A Comparison of the USAF Projected A-10 Employment in Europe and the Luftwaffe Schlachtgeschwader Experience on the Eastern Front in World War Two" (Master's thesis, U.S. Naval Postgraduate School, 1977); Pierre Sprey, "Countering a Warsaw Pact Blitz," in <u>Proceedings of Seminar on Anti-Tank Warfare, 25-26 May 1978</u>, by Battelle Laboratories (Columbus, Ohio: Battelle Laboratories, 1 May 1979), 119-126; Hans-Ulrich Rudel, <u>Stuka Pilot</u> (Dublin, Ireland: Washburn and Sons, 1952); Rudel, "Colonel Rudel Question and Answer Session," also in <u>Proceedings of Seminar on Anti-Tank Warfare,</u> <u>25-26 May 1978</u>, by Battelle Laboratories, 139-169; and "Wings of the Luftwaffe," produced by Phil Osborn, 50 minutes, Network Projects, 1992, videocassette (the Stuka had to continue operational flying because the Germans never updated the design). Ratley praised the Stuka's Eastern Front performance. Sprey influenced the A-10's design and discusses Rudel's influence upon his own CAS plane design ideas in the above speech.

Rudel's Eastern Front experience brings up the Russians' successful ground attack plane, the Ilyushin Il-2 Shturmovik. It was heavily armored, carried a respectable weapons load, and was the Soviets' weapon of choice for targets just beyond artillery range. See Bavaro, "Tank Busters," (high praise); Boyne, 142-143, 153-157, 162-164, 384, 391; Hallion, <u>Strike</u>, 234, 244-245 (after condemning the Stuka, ironically praises the Shturmovik and blames its losses on Soviet fighters' inability to protect it); Higham, 95 (Shturmovik "was in something of a class by itself"); Hogg, 204-207; and Kenneth Whiting, "Soviet Air-Ground Coordination," in Cooling, ed., <u>Case Studies</u>, 115-147. Only Hogg and Whiting mention that Shturmovik was no air fighter either, and thus suffered heavy losses (though Boyne writes that German fighter pilots tallied phenomenal aerial victory scores in the East).

The Stuka's negative image in American airmen's minds is from Robert Futrell, <u>Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force, 1961-1984</u>, vol. II, (MAFB: Air University Press, 1989), 174, 492; Head, "A-7," 253, 284; COL Walter Kross, USAF, <u>Military Reform: The High-Tech Debate in the Tactical Air Forces</u> (Fort McNair, Washington, D.C.: National Defense University Press, 1985), 89, 157; and COL William Scott, USAF, "The Rise and Fall of the Stuka Dive Bomber: A Warning for Today," <u>Air University Review</u> 17 (May-June 1966): 47-63. World War II bomber veteran Scott reveals his aversion to building planes to suit the army or limited wars while neglecting the ability to defeat top-line enemy fighters. His take on the Stuka's Eastern Front fortunes was that it made no contribution to the battle for air supremacy. COL Kross gives a fairly balanced account of the 1980s debate between defense reformers who wanted low-cost, efficient airplanes versus "TACAIR planners," as he calls Air Force procurement staffers. He mentions that both sides used the Stuka example either to praise or denigrate the simple, dedicated CAS plane concept. Finally, see Boyne, 342-347, for overall Luftwaffe impotence on the post-Normandy Western Front. would abandon them since close air support was a third priority and the air commander now had the authority to keep it that way.<sup>30</sup> Also, some considered the airmen too rash in making such a sweeping statement based upon the American forces' fumbling start. Perhaps with more planes and better air-ground coordination--after all, the ground commanders initially misused their own tanks--air units could be assigned to key subordinate ground commanders.<sup>31</sup> As mentioned earlier, there were not many close air support missions flown in either North Africa or the ensuing operation in Sicily. Commenting upon this situation, John McCloy, the American Assistant Secretary of War, investigated air support issues in spring 1943, and offered an assessment that rated attention in America's citizen-soldier army:

It is my firm belief that the air forces are not interested in this type work [close air support].... What I cannot see is why we do not develop this auxilliary [*sic*] to the infantry attack even if it is less important than strategic bombing. It may be the wrong use of planes if you have to choose between the two but to say that airpower is so impractical that it cannot be used for immediate help of the infantry is nonsense and displays a failure to realize the air's full potential.<sup>32</sup>

Many of the decisions *had* been made in the heat of America's first introduction to mechanized warfare, and in a quick flowing combat environment besides. When forward movement stalled during the Italian campaign, airmen and soldiers had time to sort out how to conduct air support. Ground and air leaders collocated their headquarters and set up a coordinated request system which handled air support requests. And for the first time, air leaders assigned radio-equipped, pilot-led liaison teams to tactical ground units (no lower than battalion level) so they could direct aircraft onto targets. There were still occasional

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<sup>&</sup>lt;sup>30</sup>Kent Roberts Greenfield, "Army Ground Forces and the Air-Ground Battle Team, Including Organic Light Aviation, Study No. 35," (Fort Monroe, Va.: Army Ground Forces Historical Section, 1948), 47, photocopied; and Futrell, <u>Ideas</u>, vol. I, 141.

<sup>&</sup>lt;sup>31</sup>McLennan, 21-24; and Greenfield, "Study No. 35," 45-50.

<sup>&</sup>lt;sup>32</sup>John McCloy, cited in McLennan, 19; and Gonzales, <u>Tactical Air Support of</u> <u>Ground Forces</u>, 29. Gonzales sees FM 100-20 as a response to McCloy's remarks, and in a way it was. McCloy made his comments in April 1943 and FM 100-20 was published in July 1943.

problems. American troops did not always adhere to the procedures for identifying their positions to their own planes, while pilots and liaison parties struggled with target briefing procedures. The Army Air Force tried to use bombers for close air support, but the ponderous planes and their rigid planning procedures were ill-suited to the changing conditions in even this relatively static front. The results of the above difficulties could be tragic at times, with airplanes hitting their own troops, or not responding quickly enough to urgent requests. But the efforts in Italy represented an important first step toward better close air support. This was also significant because, without appreciable ground movement to provide additional pressure upon the German Army, the Army Air Force's 1944 air interdiction campaign in Italy, code-named Strangle, failed to cause a German military collapse. Meanwhile, close air support contributed to several tactical successes, and earned the appreciation of the American commander in Italy, General Mark Clark.<sup>33</sup>

Thanks to a fortuitous convergence of factors, Army Air Force support of the soldiers achieved its greatest effect during the American sweep across France in 1944. Due to dissension at the highest levels of command, Army Air Force control over all aspects of air action was not possible; otherwise, the airmen might have adhered strictly to their dogmatic concept of strategic bombing and interdiction while ignoring ground objectives. Instead, the diverse air command setup and an abundance of American planes

<sup>&</sup>lt;sup>33</sup>Boyne, in <u>Clash of Wings</u>, 187, ignores the P-40 and praises the introduction of the P-47 and P-51. Hallion, in <u>Strike</u>, 179-187, discusses Italian campaign air support innovations, notes aircrew dedication to troop support, and also hails the fighters' appearance. Wilt, "Allied Cooperation in Sicily and Italy, 1943-1945," 204-220, and Greenfield, "Study No. 35," 76-85, discuss changes in air support procedures and effectiveness. Mark Clark's compliments are from McClennan, 25 (though his study does include numerous complaints about problems in its Appendix TAB 'A'). Strangle's failure is from R. Ernest Dupuy and COL Trevor N. Dupuy, USA (ret.), <u>The Encyclopedia of Military History, from 3500 B,C. to the Present</u>, 2d revised ed. (New York: Harper & Row, 1986), 1104; Hallion, "Battlefield Air Support," 14; and Eduard Mark, "Operation Strangle, March 19-May 10 1944," chap. in his <u>Aerial Interdiction in Three Wars</u> (Washington, D.C.: Center for Air Force History, 1994). Mark believes that Strangle was a success, in that it weakened German defenses for later Allied ground attacks. His case is convincing, but he too smoothly glosses over its utter failure to dislodge the Germans during its own attacks.

and pilots in 1944 Europe meant that an entire air force--the Ninth Air Force--could be dedicated to army support. Even this might not have worked, given the Ninth Air Force commanders' doctrinally-induced lukewarm attitude toward this mission, combined with FM 100-20's dictum that the air force commander still had final say on mission apportionment. But commanding the Tactical Air Commands (TACs) under the Ninth Air Force commander were two pragmatic and energetic officers, Brigadier Generals Otto Paul "O.P." Weyland and Elwood "Pete" Quesada. The TACs worked with a specific American army--Quesada's Ninth TAC supported General Omar Bradley's Fifth Army and Weyland's Nineteenth TAC supported General George Patton's Third Army--and both air leaders got on famously with their soldier counterparts. Bradley's assessment of Quesada was that he was "unlike most airmen who viewed ground support as a bothersome diversion to war in the sky." And during his spearhead drive across France, Patton sometimes entrusted to Weyland and his pilots the unprecedented responsibility for covering his flanks.<sup>34</sup>

Most accounts describe Pete Quesada as the real driver in fomenting better air and ground force relations. Quesada's brash, sometimes abrasive, personality ensured that coordination between the various levels of air and ground commands within Ninth TAC and Fifth Army actually occurred. He went so far as to put a radio and a liaison pilot in at least one tank in the leading armored units. This quelled the sources of "simmering complaints" by ground troops about friendly fire and "laborious" communications procedures. He also pushed his fighter pilots, who were at first reluctant to forsake the

<sup>&</sup>lt;sup>34</sup>GEN Omar N. Bradley, USA (ret.) <u>A Soldier's Story</u> (New York: Henry Holt & Company, 1951), 249, (air leaders' coolness toward air support), 250 (Quesada assessment quote); McLennan, "Close Air Support History," Tab C to Annex A, 1-2; Thomas Alexander Hughes, <u>Over Lord: General Pete Quesada and the Triumph of Tactical Air Power in World War II</u> (New York: The Free Press, 1995), 119, 156, 240-242; and W.A. Jacobs, "The Battle for France, 1944," in Cooling, ed., <u>Case Studies</u>, 237-246, 267-268.

glories of aerial combat, to learn and appreciate air-to-ground weapons delivery in support of the Army.<sup>35</sup>

Fighter plane use and effectiveness in this particular campaign, as well as the effectiveness of the campaign's close air support overall, would be one of its enduring legacies, as well as a major source for the decades-later CAS debates. The twin-engine bombers upon which the prewar air force based its doctrinal hopes were a disappointment in this fast-moving campaign. They still performed the interdiction mission well enough--though they were vulnerable to fighters and heavy flak--but they required at least forty-eight hours advance notification of a targeting request, which they weighed against other air campaign priorities. Thus they mattered little, for example, to a tank unit commander facing a sudden counterattack of unexpected force. Heavy bomber CAS performance was spectacularly uneven. The heavy bombardment which helped spur the American breakout at St. Lo crippled the warfighting capacity of the German soldiers who received it, but the bombers' inflexible and cumbersome attack procedures directly contributed to one of the war's most infamous fratricide incidents.<sup>36</sup>

<sup>&</sup>lt;sup>35</sup>Hughes, <u>Over Lord</u>, 119 (quotes), 182-187; Jacobs, "The Battle for France," 254-255, 259-260, 271-273; and John Schlight, "Elwood R. Quesada: Tac Air Comes of Age," in <u>Makers of the United States Air Force</u>, ed. John Frisbee (Washington, D.C: Air Force History and Museums Program, 1996), 196-197. Fratricide--the term for the accidental killing of one's own troops--involved ground force errors as much as aircrew errors. In order to stop American troops from shooting at their own planes, Army commanders restricted firings to an officer's express permission. They also had to suppress rumors that Germans were flying American planes (no doubt created by air-to-ground fratricide incidents). See Hughes, 288; and Arthur Hadley, <u>The Straw Giant: Triumph</u> and Failure: <u>America's Armed Forces</u> (New York: Random House, 1986), 60 (Hadley served in France as an army officer during World War II); and Kenneth Werrell, <u>Archie, Flak, AAA, and SAM: A Short Operational History of Ground-Based Air Defense</u> (MAFB: Air University Press, 1988), 46-51.

<sup>&</sup>lt;sup>36</sup>Head, 110-113; Hughes, 205-216; and Jacobs, 281-282. For specific heavy bomber CAS critique, see Ian Gooderson, "Heavy and Medium Bombers: How Successful Were They in the Tactical Close Air Support Role During World War II?" <u>The</u> <u>Journal of Strategic Studies</u> 15 (September 1992): 367-399; Hallion, "Close Air Support: A Retrospective Assessment," 13-14; Hallion, <u>Strike</u>, 206-214, 224; and Adrian R. Lewis, "The Failure of Allied Planning and Doctrine for Operation Overlord: The Case of

By summer 1944, the American forces in France enjoyed air superiority, which meant that the TACs' fighter planes were neither diverted from their CAS missions nor required to fight enemy fighters on their way into or out of the target area. Because of their maneuverability, speed, and relatively small–compared to the bombers–logistics requirements, fighters were much more adept at CAS and made a serious contribution to the ground war. Forced by the American breakout from Normandy into a war of maneuver requiring open vehicular travel, German soldiers later revealed their wonder that the swarming fighters attacked everything that moved. This especially happened within the twenty miles of the front lines that comprised the battlefield air support arena. While the fighters induced no mass panic among the Germans, they caused many Germans to desert vehicles that were not destroyed outright. American ground officers observed that German resistance was less fierce after air attacks, while American troop morale soared accordingly. Perhaps the most prominent example of CAS effectiveness came when one German Army commander insisted upon surrendering his unit to O.P. Weyland.<sup>37</sup>

The fighter CAS success reinforced the North Africa-born impression that fighters could easily excel in most any task, including the CAS mission. The star plane for the role was Republic Aviation's P-47 Thunderbolt (for photos, see Appendix Figs. 8 and 9), a rugged radial-engine brute of a plane which also enjoyed success against German fighters. Its durability was probably one reason why CAS aircraft losses were not as high as expected--and even less than those experienced by heavy bombers on strategic missions.

Minefield and Obstacle Clearance," <u>The Journal of Military History</u> 62 (October 1998): 800, 806-807. In both works, Hallion praises the bombers' contribution to the Normandy breakout, but denigrates overall heavy bomber air support effectiveness. He notes the cumbersome procedures as well as the fratricide incidents. In <u>Strike</u>, he criticizes medium bomber performance as well. Both Hallion (in "Assessment") and Lewis criticize the Normandy pre-invasion bombing as less relevant to the landing troops' needs than pure CAS (Lewis believes that CAS and more direct naval firepower support could have helped the mine and obstacle clearance operation at Omaha Beach). Gooderson not only writes about the mixed results but recounts the bomber men's irritation at being diverted from their other missions to do air support.

<sup>&</sup>lt;sup>37</sup>Hallion, <u>Strike</u>, 203-206, 214-23; Hughes 24; Jacobs, 246-251, 277-279, 282-284; and Greenfield, "Study No. 35," 90.

Other fighters such as the legendary P-51 (for photo, see Appendix Fig, 10) and Spitfire also did CAS, but each had certain structural vulnerabilities and neither could carry as much ordnance as a Thunderbolt.<sup>38</sup>

The concept of the fighter-bomber was born out of this time; and along with it there arose the idea that the average fighter pilot could handle the mission without much practice. With only one exception—the years following the Vietnam War—the Air Force pursued the multirole fighter dream sparked by the P-47 and P-51's World War II accomplishments. Looking back from the early 1970s, one observer intimately familiar with Air Force design philosophy asserted: "Every [fighter plane] . . . has been a multipurpose plane and a fighter-bomber very much of the old P-47 tradition . . . . in the Air Force, all [fighter] pilots are multipurpose." Indeed, as the years passed, Air Force generals waxed nostalgic about these planes' success in diverse missions, and at least one Air Force historian in later decades cited their performance as proof that fighter planes.<sup>39</sup>

<sup>&</sup>lt;sup>38</sup>The adaptation of air superiority pilots and their fighters to the ground attack role can be found in Barnes, "Concept," 16-22; Boyne, 344-345; Futrell, <u>Ideas</u>, vol. I, 174; Hallion, "Battlefield Air Support," 19-20; Hallion, <u>Strike</u>, 225, 264, 267; and James Hasdorff, <u>Interview of Maj Gen James R. Hildreth</u>, (Spring Hope, N.C.: USAF Oral History Program, 27-28 October 1987), 65, transcript, AFHRC Holding K239.0512-1772; Head, "A-7," 110-113, 157-158, 252; <u>Jane's Fighting Aircraft of World War II</u> (New York: Crescent Books, 1996), 248-249, 254-255 (performance details); and Wilt, 212-213.

Barnes discusses how tactical exigencies sometimes require that air forces use planes for missions for which they were not designed. Hildreth was involved in Air Force aircraft procurement and testing and asserted: "you don't know how you are going to use. ...[an] airplane in combat until you get into combat" (65). The P-51 design was a response to a British need for a high-speed, light dive-bomber (Boyne claims that it was built for reconnaissance, 334) and was designated the A-36. The A-36 was underpowered and the British re-engine it, thus creating one of the war's finest air-to-air fighters. The Army Air Force wanted the P-47 to be its top air-to-air machine, and while it did well in that capacity, it worked better as a ground attack plane. Boyne praises both the P-47 and P-51's operational performance (387).

<sup>&</sup>lt;sup>39</sup>Observer quote is from Jack Neufeld, <u>Mr. Pierre Sprey</u>, (MAFB: USAF Oral History Interview, 12 June 1973), 26-27, transcript, AFHRC Holding K239.0512-969 (cited with permission of Mr. Sprey, per document's instructions). Other sources are

The question was whether these planes and their pilots could do *all* of the tasks *well*. A later Government Accounting Office (GAO) report addressing air support observed that CAS, like any other air combat mission, required special aircraft performance characteristics and pilot training requirements. Trying to make planes and pilots perform more than one mission required trade-offs and sacrifices that degraded the ability to excel at either. As the service examined purchasing single-mission tactical planes decades later, one Air Force pilot's Air Command and Staff College paper cited World War II as an example of the pitfalls in pursuing the multirole fighter dream. The P-47 and P-51 were intended as single-mission planes until wartime demands directed them to other missions—in which they *just happened* to prevail. He further observed that different warfighting environments in that global conflict allowed certain planes to succeed in certain

Barnes, 16; LTCOL John Dick, USAF, <u>Corona Ace Interview of General William</u> <u>Momyer, USAF (ret.)</u> (Washington, D.C.: U.S. Air Force [USAF] Oral History Program , 31 January 1977), 38-40, 52-53, transcript, Air Force Historical Research Center [AFHRC] Holding K239.0512-1068; Hallion, <u>Strike</u>, 196, 264, 267 (cites this war as proof of the fighter's air support worth); Head, "A-7," 112-113, 157-158; GEN William Momyer, USAF, testimony in Congress, Senate, Hearings before the Special Subcommittee on Close Air Support of the Preparedness Investigating Subcommittee of the Committee on Armed Services, <u>Close Air Support</u>, 92d Cong., 1st sess., 29 October 1971, 197; MAJ Raymond Reeves, USAF, "Close Air Support, AH-56 vs. A-X: Doctrine Conflict Between the Services," (Research Study, Air Command and Staff College, May 1972), 24; GEN Bernard Schriever, USAF, testimony in Congress, House, <u>Close Air</u> <u>Support</u>, 30 September 1965, 4838, 4950; and Mike Worden, COL, USAF, <u>The Rise of</u> the Fighter Generals: The Problem of Air Force Leadership, 1945-1982 (MAFB: Air University Press, 1998), 12-13.

GEN Momyer praised the P-47's CAS prowess in his Senate testimony. Air Force Systems Command chief, GEN Bernard Schriever, briefly described the evolution of the service's fighter-bomber preference during his House appearance. MAJ Head's dissertation on the A-7 describes the evolution of the Air Force's desire for fighter-bombers. Reeves and Hallion cite the fighter CAS performance in World War Two Europe as a prime example of the multirole fighter's continued worth.

Of course multi-mission planes require capable pilots. Worden cited World War Two observations about fighter pilots' aggressiveness and superior flying ability. GEN Momyer spoke of the fighter pilot's ability to adapt, which given the diverse nature of his normal in-flight tasks, was true. The Air Force leader's deduction, however, was that adapting to other missions was fairly easy.

situations. Indeed, this is how slower fighters and other planes successfully flew ground support missions until late in the war. And if the multirole tactical plane ideal was elusive, achieving proficiency in all of that plane's missions was even tougher. The same engineer who commented upon the service's multirole bent sharply appraised the pilots who flew such machines: "a multipurpose pilot is probably worse than a multipurpose plane." Speaking of his own experience in jet fighter-bomber units, the staff college author observed that he and his fellow aviators simply could not always maintain top proficiency in all of the various missions and tactics assigned to them. His was an observation of later conditions, of course, but had it been any easier flying air support in fighters during World War II? One of the scholars of Quesada's air support setup, Thomas Alexander Hughes, made clear that the fighter pilots flew air support well because Quesada made them do well. Hughes and another air support scholar, Brereton Greenhous, pointed out that at first, American fighter pilots were neither interested in the mission nor competent to fly it. Hughes and yet another scholar, Ian Gooderson, wrote that techniques for attacking German vehicles required much practice to be effective, and that the Americans had to set up a special school to teach fighter pilots how to fly ground attack. The pilots did better after this, but the mission remained tough. They may have been flying the fastest and most advanced machines of their day, but their losses were still high. As one air leader said, a mission against enemy fighters might yield no combat if the enemy failed to appear; but in a CAS mission, the enemy was always present and armed.<sup>40</sup>

<sup>&</sup>lt;sup>40</sup>Quote is from Neufeld, <u>Sprey</u>, 27. The staff college pilot is Barnes, 16-22, 36-46. The Quesada scholar is Hughes, <u>Over Lord</u>, 127-131. Other scholars' observations are Ian Gooderson, in "Allied Fighter-Bombers Versus German Armour in North-West Europe, 1944-1945: Myths and Realities," <u>The Journal of Strategic Studies</u> 14 (June 1991): 211-213; and Brereton Greenhous, in "Aircraft versus Armor: Cambrai to Yom Kippur," chap. in <u>Men at War: Politics, Technology, and Innovation in the Twentieth</u> <u>Century</u>, eds., Christon Archer and Timothy Travers (Chicago, Ill.: Precedent, 1982), 106. The GAO report is <u>Close Air Support: Principal Issues and Aircraft Choices</u>, 72-74. For fighter losses; see Jacobs, 279-280; and Werrell, <u>Archie, Flak, AAA, and SAM</u>, 57. The air leader is GEN Momyer, in Dick, <u>Momyer</u>, 28-29.

Another observer, Denis Warner, notes that fighter pilots often dismiss the CAS mission as less attractive than others; see Warner, "Army Needs Its Own Close Air Support," <u>Pacific Defense Reporter</u> 11 (October 1984): 35-36. In this piece, he

The fighter pilots' claims for attack mission prowess were such that some close air support historians later claimed that their effectiveness against tanks with bombs and rockets was overrated. True, rockets could be difficult to shoot accurately, and a bomb had to hit very near a tank to destroy it. But Quesada's pilots worked to improve their accuracy with these weapons, and they also studied captured German tanks' vulnerable areas so that even their planes' fifty-caliber machine gun bullets could set a tank's engine on fire--or ricochet up into the tank's vulnerable underside. And whatever the effectiveness against tanks, they still wreaked havoc against the unarmored and lightly armored vehicles that comprised the bulk of any army's maneuver units.<sup>41</sup>

complains about the Royal Australian Air Force's (RAAF) infatuation with fast fighters for CAS and the ensuing lack of commitment to that mission. Citing historical precedent, Warner recalls World War II air commanders' distaste for the mission, even in the successful Normandy air operations.

<sup>41</sup>An airplane's ability to destroy tanks was and is controversial, due to the weapons procurement implications thereof (Mr. James O'Bryon, Deputy Director, Operational Test & Evaluation, Live Fire Testing, Office of the Secretary of Defense, and former Deputy Director, Ballistics Research Laboratory, personal interview by author, 7 May 1997, Washington, D.C., notes and tape recording in author's possession).

Two critics of the fighters' effectiveness against German tanks in France are Brereton Greenhous and Ian Gooderson. Greenhous, in "Aircraft versus Armor, 104-107 (praises British air support while criticizing initial American fighter pilot apathy toward learning weapons delivery procedures). Gooderson, in "Allied Fighter-Bombers Versus German Armour in North-West Europe," 210-229 cites military assessment teams' findings. He concedes aircraft knocked out tanks by strafing their weak spots, and especially by using rockets. However, he points out that rockets' inaccuracy and pilot claims based on a lot of flashes and smoke meant they were not as effective as thought.

Though Gooderson is a harsh critic of fighter success against tanks, he still cites their effectiveness against lightly-armored vehicles (214-221, 226-228). Greenfield's "Study No. 35" cites fighter effectiveness (90), but also notes that target acquisition could be difficult for even propeller-driven fighter planes (54-55, and 69-70). Hallion, in <u>Strike</u>, 225-227, concedes inflated pilot claims, but still believes that they were more effective than some critics claim. Hogg, in <u>Tank Killing</u> (203-223), gives a measured appraisal of all of the combatants' planes, concluding that they required accurate and powerful weapons--heavy rockets and guns--to do the job. Hughes believes that they did succeed in destroying tanks and especially other, less armored, vehicles; <u>Over Lord</u>, 145-151, 190-191, 220-224, 236-242. Frank Jordan's U.S. Air Force Oral History Program interview with former P-47 pilot William Jarvis, (Langley AFB, Va.: 7 October 1977,

One Army Air Force leader complained that artillery should be doing what the fighters were doing, but his arguments fell on deaf ears. The Army came to expect the service the airmen provided. Especially in a war of movement, ground units might not have all of their heavy firepower available, and CAS could be the remedy. And as many military observers assert about American fighting style, if firepower was available, the American citizen-soldier army relied upon it more than sacrifice to achieve battlefield success. Some point out that the Army has often followed the dictum to send a bullet into the enemy's position before sending a man. And one of the acclaimed historians of the American Army's exploits in World War II France, Stephen Ambrose, cited Wehrmacht soldiers' observation that "the GIs let the high explosives do the hard work." Later Army complaints about the independent Air Force were based upon this expectation of firepower upon demand--as John McCloy's comments about Army Air Force CAS in North Africa hinted. CAS was a firepower solution at the tactical level just as sending heavy bombers deep into Germany was one at the strategic level; and indeed, a scholar of the mission pointed out that CAS "brings the greatest force to bear on the battle with the least risk of lives." At least in the latter stages of the European war, the Army Air Force amply answered the ground troops' call for sending bullets instead of men, because as the war in Europe ended, Army leaders warmly praised the airmen.<sup>42</sup>

Quotes are from Stephen Ambrose, <u>Citizen Soldiers: The U.S. Army from the</u> <u>Normandy Beaches to the Bulge to the Surrender of Germany</u> (New York: Simon & Schuster, 1997), 489; and MAJ Charles Westenhoff, USAF, "Close Air Support: Battlefield Challenges, Strategic Opportunites," in <u>Air Support of the Close-in Battle: Past</u>

transcript, AFHRC Holding K239.0512-1124), reveals that bombing tanks was indeed difficult. Jacobs, in his "The Battle for France" (274, 282-284), asserts that the fighter pilots were effective overall, citing such feats as their thwarting a German armored attack at Mortain on 7 August 1944.

<sup>&</sup>lt;sup>42</sup>The complainer was a future commander of the Ninth Air Force, MGEN Hoyt Vandenberg; see Hughes, 224. General Omar Bradley dismissed Vandenberg's and other air leaders' objections; see Greenfield, 30. Examples of Army praise and expectation of CAS can also be found in Congress, Senate, <u>Close Air Support</u>, 186; Greenfield, 29-31, 35-36, Tab C of Annex A, 2-7; Jacobs, 281-284; Hallion, <u>Strike</u>, 227; and Russell Weigley, <u>Eisenhower's Lieutenants: The Campaign of France and Germany, 1944-1945</u> (Bloomington, Ind.: Indiana University Press, 1981), 166.

The final World War II CAS item concerns the Pacific theater. During early battles such as Guadalcanal, air superiority was in question, as even fighters had trouble performing CAS while fending off enemy fighter attacks during a mission (meanwhile, non-air superiority fighter types such as the Douglas SBD Dauntless dive bomber still flew CAS and sea war missions against stiff Japanese fighter opposition). In the later island fights, the Americans enjoyed air superiority and an abundance of aircraft to support the troops. As in Europe, the air superiority requirement for CAS meant that, regardless of the

Lessons, Present Doctrine, Future Directions: Proceedings of the United States Air Force Aerospace Power Symposium, 9-10 March 1987 (MAFB: Air War College; henceforth cited as Proceedings, Symposium: Air Support), 57.

Observations about the American penchant for firepower solutions in wars of annihilation, as well as several comments about how these applied to World War II strategy, are in Ambrose, Citizen Soldiers, 488-489; BGEN John "Doc" Bahnsen, USA (ret.), telephonic interview by author, 1 July 1997, notes and tape recording in author's possession (Army helicopter aviation leader; cites the "bullet" dictum); Beaumont, Joint Military Operations: A Short History, 114-115; Harold Brown, Thinking About National Security: Defense and Foreign Policy in a Dangerous World (Boulder, Colo.: Westview Press, 1983), 226; John Dick, LTCOL, USAF, Gen Gabriel P. Disosway, (USAF Oral History Interview, 4-6 October 1977), 196, transcript, AFHRC Holding K239.0512-974 (observes of the Army, "They want . . . somebody to come and shoot that guy out of a tree. They don't want to have to bother with him"); James Fallows, National Defense (New York: Random House, 1981), 26-27, 32-34; Colin Gray, The Geopolitics of Superpower (Lexington, Ky.: The University Press of Kentucky, 1988), 197; Arthur Hadley, Straw Giant, 194-196; Andrew Krepinevich, The Army and Vietnam (Baltimore, Md.: The Johns Hopkins University Press, 1986), 6-8, 170-171 (also recalls "bullet" dictum); Kross, Military Reform, 100; BGEN E.M. Lynch, USA (ret.), "Close Air Support: Its Failed Form and Its Failing Function," 124 Armed Forces Journal International (August 1986; henceforth cited as AFJI): 72-78 (writing about a later CAS controversy; emphasizes that ground troops want CAS upon demand); Donald Mrozek, Air Power and the Ground War in Vietnam: Ideas and Actions (MAFB: Air University Press, 1988), 5; Geoffrey Perret, A Country Made by War: From the Revolution to Vietnam-The Story of America's Rise to Power (New York: Random House, 1989), 412-415, 436-437, 556-557; Russell Weigley, The American Way of War: A History of United States Military Strategy and Policy (Bloomington, Ind.: Indiana University Press, 1977), xvii-xxiii, 223-241, and 358-359; and Westenhoff, USAF, "Battlefield Challenges, Strategic Opportunites," 57.

type of plane performing it, an air force had to dominate the skies either by sheer numbers, or by the quality of the fighter pilots and fighter aircraft *dedicated* to clearing the skies.<sup>43</sup>

General George Kenney, an innovative, pragmatic, hard-charger of the Pete Quesada mold, led the army air force supporting General Douglas MacArthur's South Pacific offensive. As such, Kenney made sure that his pilots responded to CAS requests. Even so, the long distances between ground bases and the front lines, as well as the humid jungle conditions, restricted high-quality air support. Radio communications suffered due to atmospheric conditions and breakdowns. The jungle terrain often lacked distinct visual references and the jungle itself inhibited ground-to-air signalling. These conditions and the long distances often combined to create CAS response times of as late as an entire day. Such a condition was unsatisfactory in Europe, but the island battles often featured glacial advances against well-protected Japanese defensive positions. As a result, CAS firepower was welcome even if it was late. CAS was critical to success in many Pacific battles, of which the 1943 Australian attack on New Guinea's "Shaggy Ridge" and the 1944 Marine assault on Bougainville's "Hellzapoppin' Ridge," were prime examples.<sup>44</sup>

<sup>&</sup>lt;sup>43</sup>Greenfield, 32, 93-94 (at times the Air Force could afford to task up to five squadrons to destroy a dug-in Japanese infantry *platoon*, which says something both about aerial abundance and the American preference for firepower over troop sacrifice); Hallion, <u>Strike</u>, 38, 166 (specifically points out air superiority requirement for CAS); and Joe Gray Taylor, "American Experience in the Southwest Pacific," in <u>Case Studies</u>, ed. Cooling, 298-306, 329. Taylor opines that, if more of the available planes were good at air-to-air combat during those desperate early days, air commanders might have assigned them exclusively to that mission at the expense of CAS (301). For the Dauntless' undaunted performance in the teeth of Japanese fighter resistance, see Barrett Tillman, <u>The Dauntless</u> <u>Dive Bomber of World War Two</u> (Annapolis, Md.: Naval Institute Press, 1977). Unfortunately, Tillman mostly focuses upon the plane's success in various sea battles while neglecting its equally valuable service in island battle CAS. Hallion was less impressed with the plane, citing instances where unescorted *Army Air Force* Dauntlesses on long range missions suffered heavy losses.

<sup>&</sup>lt;sup>44</sup>Boyne, 269; Greenfield, 4, 7-8; Hallion, <u>Strike</u>, 165-167; LTCOL Edward Littlejohn, USA, "Close Air Support: Battle in the Fourth Dimension," (Military Studies project, U.S. Army War College, 1990), 14; and Taylor, "Southwest Pacific," 301-323 (describes many examples where CAS was used). Littlejohn cites a greater percentage of CAS was flown in the Pacific than in Europe.

As the Pacific island advance created a variety of battle areas, Kenney's airmen used a variety of planes to accomplish CAS--from fighters to heavy bombers. But in spite of Kenney's attitude, the most practical and dedicated air support came to be that of the Marines. Though they considered troop support a primary mission, Marine airmen neglected CAS before the war. But as battle experience increased, they became increasingly enthusiastic and developed a reliable CAS setup. Devoted to their fellow Marines, many actually came to the front to survey the terrain and interact with the troops. This attitude could be critical, because in certain conditions Marine air was the only heavy, accurate firepower the landing forces could get. Meanwhile, even as late as the Luzon, Philippines, ground fighting in 1945, Army Air Force officers occasionally bickered with their soldier counterparts.<sup>45</sup>

The Pacific Ocean war ended after B-29 strategic bombers dropped atomic weapons on Japan. The bombers' effectiveness was already the subject of some debate, as the U.S. Strategic Bombing Survey for Europe was underway at that time. But the fact that the bombs induced the surrender of the Japanese, who fanatically defended various small Pacific islands throughout the war, spurred the Army Air Force bomber men's belief that they possessed the ultimate strategic, doctrinal, and procurement trump card. Also, the

<sup>&</sup>lt;sup>45</sup>Hallion, <u>Strike</u>, 53, 165-167; Littlejohn, "Battle in the Fourth Dimension," 14; and Taylor, 298, 319-321, 325, 327-329. As a small elite fighting force, Marine units did not carry many heavy weapons, and the Guadalcanal campaign was one example of when the naval gunfire support was often not available. For this latter item, see Richard Frank's <u>Guadalcanal: The Definitive Account of the Landmark Battle</u> (New York: Penguin Books, 1990), 138-140, and 206-211. The New Guinea mountain jungle fighting was an situation where ground forces--though on this occasion the troops were not Marines--could not use heavy organic firepower such as tanks. The Marines were not perfect, however. Their increasing success led to increased, sometimes poorly executed requests, and even they mistakenly attacked friendly troops in such battles as Iwo Jima.

Both Hallion and Taylor note some Marines' pre-World War II preference for air support when other firepower means are hard to obtain. However, as Taylor points out, they had not had much chance to solidly develop their CAS procedures until World War II.

For a book that discusses air support up through World War II, Hallion's <u>Strike</u> covers Pacific theater CAS for only three pages, saying little about Marine CAS. On the other hand, he spends sixty-one pages on Army Air Force air support in Africa, Italy, and France, of which the France portion comprises one 39-page chapter.

early atomic weapons could be only carried by large planes such as their bombers. In the years that followed, they would play the atomic card repeatedly to get their way, and without regard to actual foreign and military affairs developments. This included close air support, which became a neglected mission for many years.

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## CHAPTER III FOUNDATIONS, THROUGH 1960

The close air support mission was hostage to postwar developments in American foreign policy, technology, Air Force doctrine, and interservice friction. The Air Force and its nuclear capable bombers seemed to answer American leaders' concerns about how to wage the Cold War and not maintain an oversized military force. However, Americans' foreign policy assumptions did not match realities, as the Korean War revealed that there were indeed war conditions that the Air Force's bombers could not master. The Air Force chose to ignore this lesson, and abetted by Eisenhower administration policy, continued to focus upon strategic nuclear warfare at the expense of meeting its written agreements to support the Army. The Army became increasingly exasperated with this state of affairs, and aided by helicopter technological advances, started to answer the Air Force's neglect.

#### Postwar America and Its World

The victorious Americans did not quite know what to make of their new situation. The American citizen-soldiers wanted to drop the "soldier" part of that term as soon as possible, and their government obliged. Amid the backdrop of occasional demobilization riots among impatient troops, the defense establishment declined from thirteen million uniformed citizens to just over one million in three years.<sup>1</sup> Given their active involvement in foreign affairs during even so-called isolationist periods, Americans should have known better. As early as the 1870s, U.S. Marines stormed forts in a far-off place called Korea. And excluding the two world wars and the Spanish-American War, which stuck in most people's memory, American troops had since shed blood in China, the Dominican

<sup>&</sup>lt;sup>1</sup>Hadley, <u>Straw Giant</u>, 61, 74-75; and Walter Millis, <u>Arms and Men: A Study of</u> <u>American Military History</u> (New York: G.P. Putnam Sons, 1956), 317; and James Patterson, <u>Grand Expectations: The United States, 1945-1974</u> (New York: Oxford University Press, 1996), 13-14.

Republic, Haiti, Mexico, Nicaragua, and the Philippines.<sup>2</sup> The many reasons varied from enforcing the Monroe Doctrine, to protecting the United Fruit Company, to serving humanitarian concerns, to teaching foreigners to elect good men.

It is not within this work's scope to relate the details of the Cold War's start; suffice it to say that after World War II, America found itself the most powerful nation in the world. Not only that, but the European powers who previously maintained periodic order in their own region and colonies were no longer able to do so. Americans came to believe that the next most powerful nation, Soviet Russia, was a menace to all of these lands, and they gradually resolved to face it with the appropriate means.<sup>3</sup>

But what would be the means? The country was torn, as it still is, over how to reduce military size and cost while achieving its foreign policy aims. Uninterested in maintaining a large military force at war's end, Congress rejected President Harry S. Truman's bid for universal military training. It was here that air force bomber technology provided an American firepower solution if ever there was one.

### The Air Force and Its Bornber Men Take Center Stage

President Truman and all of the military services except the Navy welcomed a postwar opportunity to consolidate the service structure somehow. A major force reduction, coupled with the increasing costs and development pitfalls of modern weapons, meant the government could ill afford waste and poor planning by uncoordinated services. But though later accounts normally depict the Navy resisting this proposal because of its parochial interests, it also lacked faith in the other services' warfighting philosophies,

<sup>&</sup>lt;sup>2</sup>Dupuy and Dupuy, <u>Encyclopedia of Military History</u>, 867, 1008-1009, 1012-1013.

<sup>&</sup>lt;sup>3</sup>Three summary discussions of America's foreign policy style and Cold War-induced assumption of a worldwide commitment are Stephen Ambrose, "Introduction," in <u>Rise to Globalism: American Foreign Policy since 1938</u> (Baltimore, Md.: Penguin Books, 1971), 11-22; Maslowski and Millett, <u>For the Common Defense</u>, 494-498; and Steven Hook and John Spanier, <u>American Foreign Policy since World War</u> <u>II</u>, 13th ed. (Washington, D.C.: Congressional Quarterly Press, 1996), 1-70.

particularly those of the soon-to-be independent Air Force.<sup>4</sup> The bomber generals who ran the new service when it formed in 1947 believed that World War II vindicated their earlier claims about strategic bombing's ability to win wars almost single-handedly. Some paid lip service to the other services' combat efforts; but most others, including the new Air Force Chief of Staff Carl Spaatz, asserted airpower's strategic dominance regardless of the mixed results identified in the Strategic Bombing Survey. Lurking above all discussions of the topic was the atomic bomb; for as one historian of the Air Force's early days put it:

No matter how ill-conceived the Combined Bomber Offensive against Germany or the strategic offensive in the Pacific had been, it all became irrelevant to the American public, Congress, and the Air Force. Overnight, strategic bombardment had gone from thousand-plane missions . . . to a single bomber with a single bomb.

Ever conscious of their earlier fight for survival, the Air Force bomber men now believed their planes rendered obsolete, or at least secondary, much of the senior services' operations. And the Navy, with its long history of fighting wars in widely varying conditions, scoffed at the idea. Arthur Hadley, a World War II Army officer turned Pentagon reporter, recalled naval aviators' dismay at the Air Force's quasi-religious fervor as they asked him incredulously, "Have you ever tried to talk to these guys?"<sup>5</sup> Hadley

<sup>&</sup>lt;sup>4</sup>The motives for, and resistance to, the restructuring move which, among other things, created a separate air force are covered in various sources: Futrell, <u>Ideas</u>, vol. I, 191-196; Hadley, "The Chaotic Creation," chap. in <u>Straw Giant</u>, 74-99; and Maslowski and Millett, 501-507.

<sup>&</sup>lt;sup>5</sup>The bomber men's self-confidence and attitudes toward other services is in Futrell, <u>Ideas</u>, vol.I, 168-172 (initial praise for balanced force), and 238-239 (growing faith in own abilities and "gloves off" boasting); Hadley, 76-83; Hughes, <u>Over Lord</u>, 307-308; GEN Carl Spaatz, USAAF, "Strategic Air Power: A Concept," <u>Foreign Affairs</u> 24 (April 1946): 385-396; and Worden, <u>Rise of the Fighter Generals</u>, 27-35. Block quote and similar observations are from Smith, <u>The Air Force Plans for Peace</u>, 15-17 (quote is on 17), 113-114. Smith adds that the successful development of the large bomber and atomic bomb made Mitchell and the bomber men appear "quite prophetic." The Navy's friction with the Air Force is in this note's Hadley citation, Maslowski and Millett, 501-507; and Michael Isenberg's survey, <u>Shield of the Republic: The United States Navy in an Era of</u> <u>Cold War and Violent Peace. 1945-1962</u> vol. I, (New York: St. Martin's Press, 1993), 106-113, 118-119, and 148-149. Final quote is from Hadley, 83.

wrote that Navy pilots viewed Air Force pilots as mere technicians "who chewed bubble gum and scratched themselves while they chased girls and drank whiskey." And though only 50 percent of Air Force officers at the service's inception were college graduates, most were either formally or practically trained engineers who shared a faith in a technology that they believed had unlimited promise. And their technology appealed not only to national policy makers but also to academic types with a lot more education.<sup>6</sup>

As World War II ended, the Army Air Force leadership sanctioned a scientific study of German combat aerospace technology led by scientist Theodor von Karman. Von Karman's report recommended that the airmen move quickly to exploit the Germans' advances because they were not only quite feasible, but would also render current aviation technology obsolete. One observer later wrote that at this point, the Air Force erroneously chased purely technological objectives at the expense of military ones. And indeed, the airmen and scientists shared a mutual enthusiasm; Hap Arnold asserted that "For twenty years the Air Force was built around pilots . . . The next twenty years is going to be built

<sup>&</sup>lt;sup>6</sup>Quote and education statistic are from Hadley, 82. Smith, 109, 113, thinks the anti-intellectual tendency concerns all military officers, but adds that the Air Force leaders were indeed relatively young, lacked graduate as well as senior service school education, and were not used to working joint service issues. Commentary on the Air Force technology faith and postwar desire for independence and dominance are from Carl Builder, The Masks of War: American Military Styles in Strategy and Analysis (Baltimore, Md.: The Johns Hopkins University Press, 1989), 18-20, 22-27, 32-33, 67-73, 104-105, 136-138; and Worden, 36-37. The airmen's technological orientation also forms the theme of Michael Sherry's negative portrayal of the Army Air Force's World War II strategic bombing campaign, The Rise of American Air Power: The Creation of Armageddon (New Haven, Conn.: Yale University Press, 1987). The American belief in the promise of flight is a theme in Joseph Corn's The Winged Gospel: America's Romance with Aviation, 1900-1950 (New York: Oxford University Press, 1983). Scientist enthusiasm for flight technology is from Futrell, Ideas, vol. I, 205-206, 227; and is one theme in Michael Gorn, Harnessing the Genie: Science and Technology Forecasting for the Air Force, 1944-1986, U.S. Air Force Air Staff Historical Study (Washington, D.C.: Office of Air Force History, 1988). Alexander de Seversky was not an intellectual per sé, but he was a noted aircraft designer and author who pushed the strategic airpower concept; see Mrozek, Air Power and the Ground War in Vietnam, 10.
around scientists." Von Karman's recommendations spurred onward a chase for an invincible jet bomber already underway since 1943.<sup>7</sup>

The Truman administration did its own study in 1947. The President's Air Policy Commission, normally named after its chairman Thomas Finletter, heard testimony from leaders within the various services, as well as prominent scientists. Other than the Navy men's objections, the witnesses and the Commission's findings stressed the importance of air power as a deterrent to any future aggression. Hanging over the Commission's deliberation was not only the atomic bomb, but also Pearl Harbor. It warned in ominous tones that America could no longer afford to lose the first battle in a war. A congressional inquiry drew similar conclusions.<sup>8</sup>

These developments found their best expression in the service's first Secretary, Stuart Symington. A successful businessman noted for saving various companies by introducing operational efficiency, Symington strongly encouraged the service to develop cost assessment and management programs. He also had an eye for public relations, and ordered Air Force leaders to perfect sophisticated briefing and staffing procedures that would present a professional, unified front to congressional committees, the press, and

<sup>&</sup>lt;sup>7</sup>Charles Bright, <u>The Jet Makers: The Aerospace Industry from 1945-1972</u> (Lawrence, Kans.: The Regents Press of Kansas, 1978), 31-37; Futrell, <u>Ideas</u>, vol. I, 205-206; Michael Gorn, <u>Harnessing the Genie</u>, xiii, 17-18 (Arnold quote), 28-47 (von Karman's work); Michael Gorn, ed., <u>Prophecy Fulfilled: "Toward New Horizons" and Its</u> <u>Legacy</u> (Washington, D.C.: Air Force History and Museums Program, 1994); and Worden, 36. In <u>Harnessing the Genie</u>, Gorn traces the Air Force-science marriage and laments the retreat of the Air Force Scientific Advisory Board (SAB)--a 1944 von Karman brainchild--from purely scientific forecasting. Goon believes this was due to the increase in uniformed scientists within the service (19, 183-186). The SAB plays a role in the A-10's life. <u>Prophecy Fulfilled</u> contains von Kármán's various essays, including "Where We Stand," the report on German advances. The "later observer," is Richard Hallion, in his "A Troubling Past," 6-7. Hallion considers von Karman's work a "scientific and technological think piece regretfully detached from realistic doctrinal underpinnings."

<sup>&</sup>lt;sup>8</sup>Bright, 13; Thomas Finletter, "Survival in the Air Age," United States President's Air Policy Commission, (Washington, D.C.: Government Printing Office, 1 January 1948), 3-10; and Futrell, <u>Ideas</u>, vol. I, 224-230.

other potential critics. Finally, Symington was an airpower convert, and helped the Air Force generals pursue their jets, their bombers, and their force size aims.<sup>9</sup>

The 1947 military reorganization and ensuing American defense policy did not go as far as some people, particularly Air Force leaders, wanted. The airmen did not gain control over various functions of the other services; but the national interest, their past experience at bureaucratic infighting, and perhaps some of Symington's techniques ensured that they got the majority of the defense budget to service their planes--especially the bombers that formed the backbone of the new service. In the late 1940s, they bested their naval aviator rivals in a nasty public squabble over strategic bomber versus aircraft carrier funding. Indeed, they did so well that they provoked a failed counter-public relations campaign by the Navy, dubbed the "Admirals' Revolt," which left a residue of fear and distrust among the other services for the newest one. Even so, the airmen's tack matched Americans' desire to deter communist aggression without a large army.<sup>10</sup>

However, a jet bomber Air Force was very expensive. Jet engines were much more complex, costly, and difficult to develop and build than reciprocating engines. They also spawned expensive aerodynamic and structural design features to handle the sharply increased speeds. These were a factor in any jet aircraft design, but the bombers' size and complexity magnified the problems. Operational considerations secured more special

<sup>&</sup>lt;sup>9</sup>George Watson, Jr., <u>The Office of the Secretary of the Air Force, 1947-1965</u> (Washington, D.C.: Center for Air Force History, 1993), 38-39, 54-58, and 61-67; and Worden, 31-32.

<sup>&</sup>lt;sup>10</sup>LTCOL Thomas Garrett, USA, "Close Air Support: Why All the Fuss?" (Military Studies program paper, U.S. Army War College, 1990), 7 (commenting upon the birth of Air Force-Navy rancor, cites Air Force general's opinion of the Marines as a "small bitched-up army [*sic*] talking Navy lingo"); Maslowski and Millett, 500-505; and Smith, 15-20, 113-114 (cites doctrinal rigidity and desire for autonomy as major factors in Air Force planning efforts). A good overall account of the nasty fight between bomber generals and carrier admirals is Jeffrey Barlow's, <u>The Revolt of the Admirals</u> (Washington, D.C.: Department of the Navy, 1994). Isenberg accuses such Air Force generals as George Kenney and Jimmy Doolittle of provoking the "revolt" by their public boasts about bombers' superiority over the Navy's carriers; see "Rebellion in Gold Braid," chap. in <u>Shield of the Republic</u>, 142-162.

attention for these planes. The Air Force had to develop tanker planes to refuel bombers for the projected raids against the Soviets' homeland. Even without actually dropping an atomic bomb, the intercontinental nuclear mission and associated air refueling procedure required a constant, intensive training. Air Force bomber leaders wanted maximum mission proficiency, for the country relied upon them to counterbalance Soviet threats in such Cold War face offs as the 1948 Berlin Blockade. The Finletter Commission and later Truman administration policy supported other types of planes, but the bombers consumed by far the largest portion of the new service's manpower and budget.<sup>11</sup>

### The New Air Force and the Army

The Air Force did not eliminate the ground support mission, but Cold War and budget battle exigencies led the service to neglect it.<sup>12</sup> As for the Army, it acquiesced in this trend with only occasional rumblings. This was a shabby conclusion to a development which promised so much during World War II's last years.

After World War II ended, both airmen and soldiers looked with satisfaction upon the air support apparatus they created. The Army accepted not only this but such other airpower contributions as achieving air superiority and crippling war efforts in the German heartland. After all, even the U.S. Strategic Bombing Survey praised aerial bombing's

<sup>&</sup>lt;sup>11</sup>Bright, 13-18, 31-39, 103-117 (the latter page entry comprises the appropriately named chapter, "Design or Die"; Cold War exigencies put the aviation companies on a treadmill of ever rising performance expectations); Futrell, <u>Ideas</u>, vol. I, 229-231; Richard Rhodes, <u>Dark Sun</u>; <u>The Making of the Hydrogen Bomb</u> (New York: Simon & Schuster, 1995), 340-351.

Two good sources for the bomber men's influence and the difficulties of bomber building are Michael Brown, <u>Flying Blind</u>: <u>The Politics of the U.S. Strategic Bomber</u> <u>Program</u> (Ithaca, N.Y.: Cornell University Press, 1992); and Nick Kotz, <u>Wild Blue</u> <u>Yonder: Money, Politics, and the B-1 Bomber</u> (New York: Pantheon Books, 1988).

<sup>&</sup>lt;sup>12</sup>Joseph Harahan and Richard Kohn, eds., <u>Air Superiority in World War II and</u> <u>Korea: An Interview with Gen. James Ferguson, Gen. Robert M. Lee, Gen. William</u> <u>Momyer, and Lt. Gen. Elwood R. Quesada</u>, U.S. Air Force Warrior Studies (Washington, D.C.: Office of Air Force History, 1983), 63-64 (GEN Momyer recalled that other Air Force missions remained doctrinally alive during this time, but funding covered only the strategic mission).

impact upon the German Air Force, oil production, and transportation. Wartime lessons also made the Army leaders appreciate the airmen's desire to control air assets in a theater campaign. In 1947, Army Chief of Staff Dwight Eisenhower told both Congress and the Secretary of the Army that a supreme commander wanted one expert point-of-contact for air issues, and not several selfish subordinate Army commanders who were neither as qualified nor as available to concentrate on the air war. Finally, the atomic bomb's implications overwhelmed some Army leaders' modern warfighting view. Thus they were willing to let the airmen to form a separate service, though General Eisenhower made the creation of a tactical air arm one of the conditions of the split.<sup>13</sup>

The 1947 National Security Act and accompanying Executive Order 9877 that created the Department of Defense (DoD), Central Intelligence Agency (CIA), National Security Council (NSC), various science research agencies, and of course, the Air Force, did not sharply specify service duties. Defense Secretary James Forrestal wanted the ensuing 1948 Key West Agreement to resolve major areas of growing interservice dissension. It did not completely accomplish this regarding Air Force-Navy disputes, but the Air Force agreed to provide close air support to the Army. The Agreement document even defined close air support: "The attack by aircraft of hostile ground or naval targets which are so close to friendly forces as to require detailed integration of each air mission

<sup>&</sup>lt;sup>13</sup>Frederic Bergerson, The Army Gets an Air Force: Tactics of Insurgent Bureaucratic Politics (Baltimore, Md.: The Johns Hopkins University Press, 1980), 37-38, 43-46; Futrell, 171-178, Hadley, 82-87 (believes the Army's lack of overriding mission agendas made it more amenable to Air Force independence); Hughes, 306-308 (Army leader response to nuclear war); Richard Davis, The 31 Initiatives: A Study in Air Force-Army Cooperation, U.S. Air Force Air Staff Historical Study, (Washington, D.C.: Office of Air Force History, 1987), 9 (Eisenhower stipulation); Harahan and Kohn, Air Superiority, 65-66 (Momyer and Quesada recall the conditions for separation and the air force's strong desire to be separate); United States Strategic Bombing Survey, Summary Report (Washington, D.C.: Government Printing Office, 30 September 1945; reprint, MAFB: Air University Press, October 1987), 18-25, 30-31 (page references are to reprint edition). Eisenhower opinion is from his testimony in Congress, House, Committee on Expenditure in the Executive Department, Hearings on H.R. 2319, 219, 687, 80th cong., 1st sess., 299, cited in MAJ Head, "A-7," 104; and his Memorandum to the Secretary of Defense, entitled Tactical Air Support, 3 November 1947, cited in Futrell, Ideas, vol. I, 176-177.

with the fire and movement of those forces." With some modifications, the definition would remain the same, but its implications for operations and procurement would shift. The 1949 Bradley-Vandenberg Agreement further cemented the Air Force and Army relationship by letting the Army have airplanes, but it restricted their maximum weight so that the Army possessed only small liaison aircraft.<sup>14</sup>

The two services also worked on, or appeared to work on, detailed close air support procedures. Shortly after war's end, the Army hoped to create an air support apparatus similar to the one set up in France. The 1946 revision to their FM 31-35, Air-Ground Operations, featured co-equal air and ground commanders serving under a theater commander, along with Army and Air Force liaison officers assigned to a Joint Operations Center (JOC) and subordinate air and ground command headquarters. Air requests went up the Army chain-of-command ladder, reviewed along the way by the liaison officers. If they decided that organic Army firepower could not better handle the request, they passed it to the next higher level or to the JOC, as appropriate. The JOC determined the request's validity relative to other air tasks, and if it passed review, the JOC tasked the appropriate air unit. The procedure was cumbersome, but the two services explicitly rejected the Marines' more streamlined method. Marine liaison teams at intermediate levels could task air units in pressing circumstances, and Marines used smaller units with less heavy firepower in smaller-scale, shorter-duration operations. On the other hand, Air Force and Army leaders remembered the massive campaigns they had fought in World War II Europe. Even so, with the Air Force committing so much of its resources to strategic bombing, and Army

<sup>&</sup>lt;sup>14</sup>Public Law 253, 61 Stat., Chap., 343, 80th Cong., 1st Sess., <u>The National</u> <u>Security Act of 1947</u>, 26 July 1947, reprinted in Richard Wolf, <u>The United States Air</u> <u>Force: Basic Documents on Roles and Missions</u>, U.S. Air Force, Air Staff Historical Study, (Washington, D.C.: Office of Air Force History, 1987), 63-80 (page references are from reprint); Executive Order 9877, 26 July 1947, reprinted in <u>Basic Documents</u>, 87-89 (page references from reprint); <u>Basic Documents</u>, 151-165, 237 (CAS definition, 165). One oft-quoted essay on the Key West Agreement is Morton and David Halperin's "The Key West Key," <u>Foreign Policy</u> (Winter 1983/1984): 114-130. However, the authors err in ascribing to the agreement so much of the later difficulty between the Air Force and Army when there were other factors--not to mention several later agreements--which also played a role.

leaders facing severe manpower reductions, neither service ever gave the complex system the attention it deserved.<sup>15</sup>

The results were obvious. The Air Force eliminated the "A" for "attack" designation of even its World War II-vintage medium bombers. Liaison positions went unfilled, or often contained unskilled or apathetic people. The two services did not establish reliable radio links between pilots and ground parties. Joint maneuvers between the years 1947 and 1950 featured air response delays and embarrassing instances where lack of communications prevented any CAS. This bred some complaints from within the Army leadership, but mostly that service seemed resigned to let the Air Force go its separate way. The misuse of the "bomb line" best exemplified the actual dearth of cooperation. This was a set distance in front of one's own forward lines which ground commanders used in World War Two to designate to the airmen where they required prior coordination for air strikes. The intent was to prevent air-to-ground fratricide as well as to avoid duplication of effort by planes and the Army's own heavy firepower. In the postwar exercises the bomb line became more a strict demarcation line between ground fires and air strikes; the two services effectively gave up on the CAS mission as set forth in the Key West Agreement.<sup>16</sup>

The before-mentioned exercises also revealed that the Air Force's new jet planes created problems for CAS accomplishment. Now wedded to what one aviation historian called the "fighter-bomber" concept, the airmen viewed the F-80 and F-84 (for photos, see Appendix Figs. 11 and 12) as fighters that could also fly ground support missions, just as

<sup>&</sup>lt;sup>15</sup>Robert Asprey, CAPT, USA, "Close Air Support," <u>Army</u> 12 (November 1961): 36-37 (explains Army-Marine warfighting differences); McLennan, "Close Air Support History," 43; Futrell, <u>Ideas, Vol. I</u>, 176-177, 705 (explains fundamental warfighting concept differences between the Army and Marines); Isenberg, 266-267; Alan Millett, "Korea, 1950-1953," in Cooling, ed., <u>Case Studies</u>, 347-348; Goldberg and Smith, "Army-Air Force Relations," 46 (also explains Marine differences).

<sup>&</sup>lt;sup>16</sup>Hadley, 112-113 (Hadley describes a European exercise during the Korean War years where American planes and troops could not communicate; though it is after the time discussed in this passage, it is interesting to note the problem still persisted); Head, 113 (designation changes); Millett, 349.

P-47s did in World War II. Even though the helter-skelter push for ever faster jets would soon rendered these planes obsolete, they were a magnitude performance increase over their prop-driven predecessors. Their operating speeds were almost double, and their turn radius almost three times, that of the World War II fighters. If ground target recognition and the ability to maneuver quickly to attack a suddenly recognized ground target was difficult before, it was even more so now. Compounding the problem was the jet planes' high fuel consumption, which restricted their time over target. The Air Force stuck to the fighter-bomber concept, but it became increasingly obvious that fighter technology advances created hard choices about optimum mission performance. One could not have it both ways with the best air superiority designs and close air support designs.<sup>17</sup>

Finally, the major tactical air warfare command--the establishment of which was a precondition for Air Force independence-found itself in the budgetary and bureaucratic wilderness. The Tactical Air Command's (TAC) first chief was none other than Pete Quesada of France air support fame. Interestingly, Quesada at this time echoed other airpower enthusiasts by asserting that, if tactical air was properly managed, interdiction missions would prevent enemy ground forces from defeating one's own troops. But even this idea did not sway the bomber generals who ran the service. They believed that Quesada and his command were too close to the Army; thus, they subordinated TAC to another major command and reduced its staff to a skeleton force. Quesada told the rest of the leadership that providing support to the Army was the best insurance against the Army reentering tactical aviation with its own aircraft, but his pleas fell on deaf ears, and he resigned in disgust. This caused some minor outcry, but little else given American and Air

<sup>&</sup>lt;sup>17</sup>Walter Boyne, "The Evolution of Jet Fighters," <u>Air University Review</u> 35 (January February 1984): 36-37, 42; Bright, <u>Jet Makers</u>, 10-17; Futrell, <u>Ideas</u>, vol. I, 307; Hadley, 113; Hallion, "A Troubling Past," 4-7; Head, 110-114; Klaus Huenecke, <u>Modern</u> <u>Combat Aircraft Design</u>, trans. Dermot McElholm (n.p.: Motorbuch Verlag, 1984; reprint, Annapolis, Md.: Naval Institute Press, Airlife Publishing, 1994), 27-28 (page references are to reprint); Ed Mischler, "The A-X Specialized Close Air Support Aircraft: Origins and Concept Phase, 1961-1970," (Wright-Patterson AFB, Ohio: Air Force Systems Command Office of History, 1977), photocopied, 4; Millett, "Korea," 349; and Mike Spick, <u>The Ace Factor: Air Combat and the Role of Situational Awareness</u> (Annapolis, Md.: The Naval Institute Press, 1988), 14.

Force warfighting preferences. As for the Army's reaction, a later generation of Air Force leaders would see Quesada's observation vindicated. In the meantime, the belief in strategic bombing's invincibility and the insignificance of CAS was about to be shaken in another conflict in that far-off place called Korea.<sup>18</sup>

# CAS and Korea

As Air Force Chief of Staff Hoyt Vandenberg later complained to a senate committee, the Korean War just did not conform to Air Force doctrine. As a matter of fact, it did not fit anything Americans wanted to do regarding their world role. Nuclear deterrence did not prevent aggression. Korea was a hot war in which American citizen-soldiers fought and died. Humanitarian, military, and foreign policy considerations prevented use of the nuclear strategic bombers. At times, the Army had to fight undermanned and out-gunned in a fluid combat situation. And the rascally enemy would not do what American military leaders expected it to do.<sup>19</sup>

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<sup>&</sup>lt;sup>18</sup>CAPT Scott Fedorchak, "Close Air Support: Repeating the Past . . . Again?" <u>Air</u> <u>Power Journal</u> 8 (Spring 1994): 24; Futrell, <u>Ideas</u>, vol. I, 177-178; Hadley, 92-93; Hallion, "A Troubling Past," 6; Hughes, 310-314; Schlight, "Quesada," in <u>Makers</u>, ed., Frisbee, 198-203; Smith, 23-24 (cites outright neglect of fighters in headlong rush for strategic development); and Worden, 38-40. Atomic bombing doctrine temporarily swayed even the great tactical aviation advocate, GEN (then COL) William Momyer. In a 1948 study, he opined that tactical aviation would probably be unnecessary in the next war, and that fighter escort of bombers was obsolete (U.S. Air Force, Tactical Air Command, <u>An</u> <u>Evaluation of the Exchange of the 31st Fighter Group for the 82d Fighter Group</u>, by COL William Momyer, USAF (10 August 1948), cited in Futrell, <u>Ideas</u>, vol. I, 239. Momyer later admitted tactical air was in retreat during this time; see Harahan and Kohn, <u>Air</u> <u>Superiority</u>, 62-63.

<sup>&</sup>lt;sup>19</sup>Vandenberg citation is from his testimony in Congress, Senate, Hearings before the Committee on Armed Services and the Committee on Foreign Relations, <u>Military</u> <u>Situation in the Far East</u>, 82d Cong., 1st sess., 28 May 1951, 1378-1379, 1492-1493, 1500-150. Hadley, 100-102, 120; Isenberg, 268-280; D. Clayton James and Anne Sharp Wells, <u>Refighting the Last War</u>: <u>Command and Crisis in Korea</u>, <u>1950-1953</u> (New York: The Free Press, 1993), 1-8, 232-245; Maslowski and Millett, 520-526, and Mrozek, 14, 22, all mention that Korea was something the Americans did not expect. Isenberg writes of air leaders' dismay over the communists' ability to adapt to air interdiction. James and Wells, <u>Refighting the Last War</u>, 2-4, 7; and Millett, in "Korea," 358, 386-388, 396, write

Airpower made a big difference in this war, however. Both American and communist military leaders cited its importance in stopping two major ground offensives. American fighters maintained air superiority, restricting communist fighter jets to only occasional successes (against unescorted heavy bombers, for example, as in World War II). But the services bickered over the CAS mission.<sup>20</sup>

Most of the early air support missions were interdiction strikes not far behind the vanguard of the North Korean advance. The communists indiscreetly massed their troops and vehicles in their conventional-style offensive, creating lucrative targets for attack planes. Interestingly, given the airmen's pre-World War II dismissal of air attacks' morale effect upon troops, such strikes unnerved even hard-core communist soldiers known for their massed suicidal charges. However, Army dissatisfaction with Air Force CAS surfaced early on, for a variety of reasons. The jet pilots of the Air Force commands flying in Korea had practiced air-to-air tactics and knew little about CAS. Given the long takeoff and landing distances required by their higher flying speeds, F-80s and F-84s could not operate from the rough fields within the ever-constricting U.N. held Korean territory. Flying the increased distances from Japanese bases further limited the jets' time to work a battlefield problem, especially considering their already poor loiter time. And since they were air-to-air planes, their bomb-carrying capacity--aggravated by their poor fuel consumption--was very poor. Their radios were often incompatible with the ground parties' radios. And though their attack speeds were not the transonic and supersonic

of the Americans' reliance on airpower to make up for their lack of ground-based heavy firepower. Futrell describes the army's early lack of heavy firepower in his massive survey, <u>The United States Air Force in Korea, 1950-1953</u> (n.p.: Duell, Sloan, and Pierce, 1961; reprint, Washington: Office of Air Force History, 1996), 707 (page reference is from 1996 reprint).

<sup>&</sup>lt;sup>20</sup>Congress, Senate, <u>Close Air Support</u>, 176, 186; Futrell, <u>Air Force in Korea</u>, 371-372, 411-418; <u>Ideas</u>, vol. I, 303, 350-351; MAJ Roger Kropf, USAF, "The U.S. Air Force in Korea: Problems that Hindered the Effectiveness of Air Power," <u>Airpower</u> <u>Journal</u> 4 (Spring 1990): 39-40; Maslowski and Millett, 522-524; and Dana Johnson and James Winnefield, <u>Joint Air Operations: Pursuit of Unity in Command and Control.</u> <u>1942-1991</u>, RAND Research Study (Annapolis, Md.: Naval Institute Press, 1993), 44-45.

velocities of later jets, they were fast enough that even discerning troops in the open was nearly impossible.<sup>21</sup>

One prominent army complainer was the current U.N. Chief-of-Staff, Major General Edward Almond. Almond saw service in Italy, remembered the quality CAS developed there, and expected the same in Korea. The jets' poor CAS performance was one aggravation, but the lack of coordination effort was another. In this case, both services shared the blame, given the lack of personnel assigned to man the cumbersome air task system. The one Air Force CAS item Almond and others liked was the performance of the World War II-vintage P-51 (now designated F-51) Mustang, relegated in Korea to a ground support role. It operated from shorter strips close to the battlelines, its loiter time over the battlefield was longer, and its speed and maneuverability guaranteed better target acquisition. Finally, since the Air Force committed the plane and its pilots to ground support, those pilots worked to perform that mission well.<sup>22</sup>

<sup>22</sup>M.J. Armitage and R.A. Mason, <u>Air Power in the Nuclear Age</u> (Urbana, Ill.: University of Illinois Press, 1983), 24; James Bradin, <u>From Hot Air to Hellfire: History of</u>

<sup>&</sup>lt;sup>21</sup>GAO, <u>Close Air Support:</u> Principal Issues and Aircraft Choices, Appendix I, 55; McLennan, "Close Air Support History," 44-50 (Army leaders' praise for airmen's role in stopping the North Korean summer offensive, as well as their later condemnation of Air Force CAS); Futrell, Korea, 84-98; Richard Hallion, The Naval Air War in Korea (New York: Zebra Books, 1986), 75-76 (interservice incompatibility over maps and radios); Lynch, "Close Air Support: Its Failed Form and Its Failing Function," 76 (Army Korean War veteran recalls failures of jet CAS); Kropf, "Air Force in Korea: Problems," 41-43; and Millett, "Korea," 353-361. Target acquisition problems of jets is from MAJ Charles Goforth, USAF, "Do We Need a New Aircraft for Close Air Support?" (Master's thesis, Air Command and Staff College, 1967), 18-19; and COL J. Hunter "J.H." Reinburg, USMCR, "Close Air Support," Army 53 (April 1962): 60-61. Goforth wrote that troop acquisition probability decreased to nil above four hundred knots and fifteen hundred feet altitude, which was roughly the weapons release parameters the jets used. Reinburg, who flew Marine CAS in Korea, made similar observations based upon his experiences there. For morale effects, see Stephen Hosmer, "Psychological Effects of U.S. Air Operations in Four Wars, 1941-1991: Lessons for U.S. Commanders," RAND Project AIR FORCE Study #MR-576-AF (Santa Monica, Calif.: RAND, 1996), 88-89, 104-119. Hosmer observes that the communists' inexperience with air attacks, their exhaustion and hunger, and the open movement nature of the early war magnified the effect. Once the lines solidified and the forces constructed shelters, the morale effect was less.

Almond took command of the U.N. forces' X Corps, and the real aggravation for him and other Army leaders came when Marine airmen gave outstanding support to their particular units. The Marines remained dedicated to the CAS mission after World War Two, and many of the Marine pilots in Korea flew CAS in that war. Also, their airplanes were World War II-vintage, radial-engine F4U Corsairs and A-1 Skyraiders (see photos Appendix Figs. 13 and 14). Both planes were superior to the F-51 for CAS work, but the Skyraider was in a class all by itself. The big rugged plane could loiter, absorb punishment, and carry a lot of ordnance. Thus, the actual combat comparison between these planes and the CAS-deficient F-80s could be glaring. Retired Navy Admiral John Thach remembered what one Air Force forward air controller (FAC) told a flight of F-80s arriving on target low on fuel, carrying only two 100-pound bombs per plane, and demanding priority over Navy prop planes already in the area: "Well, take your two little firecrackers and drop them up the road somewhere because I've got something . . . that has a load." The soldiers saw this performance disparity, and Almond and other Army leaders began a public protest about unsatisfactory Air Force CAS performance. Their efforts led Army Chief of Staff J. Lawton Collins to formally request greater Army control of CAS as well as development of a dedicated CAS plane either for the Army or the Air Force.<sup>23</sup>

<sup>&</sup>lt;u>Army Attack Aviation</u> (Novato, Calif.: Presidio Press, 1994), 83-84; Futrell, <u>Korea</u>, 94-97; Michael Lewis, "Lt. Gen. Ned Almond, USA: A Ground Commander's Conflicting View with Airmen over CAS Doctrine and Employment," (School of Advanced Airpower Studies thesis, Air University, 1996), 71; Littlejohn, "Battle in the Fourth Dimension," 17-18 (citations arguing over the Air Force's air support in Korea); Lynch, "Close Air Support: Its Failed Form and Its Failing Function," 75 (F-51 praise): Millett, "Korea," 362-363; "Mistakes in Air Support Methods in Korea," <u>U.S. News & World Report</u> 34 (6 March 1953): 58-61; and Worden, 41. One reason the F-51s were in Korea was because the Air Force wanted to keep some of its advanced jets to cover the Soviet threat in Europe, and by this time there were no longer enough spare parts to maintain the more rugged P-47s; see Futrell, <u>Korea</u>, 391, Hallion, <u>Naval Air War in Korea</u>, 68 (observes that pilots preferred a P-47, given the P-51's proven vulnerabilities); and Werrell, <u>Archie</u>, 76.

<sup>&</sup>lt;sup>23</sup>MAJ Russell Bennett, USAF, "Can the A-X Adequately Replace the A-1 in the COIN and SAR Roles?" (Research study, Air Command and Staff College, 1973), 11-12 (praises A-1 performance, and mentions that its durability); Robert Dorr, <u>Skyraider</u> (New York: Bantam Books, 1988), 86-91; Hallion, <u>Naval Air War in Korea</u>, 72-73

This occurred early in the war, and for its duration Air Force leaders fought the other services as much as they did the communists.<sup>24</sup> They tried to gain control of Marine air units, complaining that the system would work if all U.N. air units were under one command. From general officer level to pilot level, they worked to eliminate the air support system's problems. Perhaps due to Symington's influence---and perhaps due to their memory of bureaucratic battles long past--the airmen closed ranks against the soldiers, who in turn could not muster enough unity and time to get their way. Indeed, a 1951 interservice CAS study revealed that Army leaders relied too much upon air support while not fulfilling their manning obligations within the air task system. Finally, the two services resolved divisive issues such as the Army's desire for CAS planes, as well as its increasing use of a new aviation technology, the helicopter. Two interservice agreements between Air

The other services had a congressional ally in Congressman Carl Vinson (D-GA), who unfavorably compared Air Force CAS to Marine CAS both before and during the war (Millett, "Korea," 351, 371). However, Vinson was a Navy partisan in the pre-Korea roles and missions battles (Hadley, 87-88, Isenberg, 66-70). One reason Army leaders preferred a dedicated CAS plane was that they believed the Air Force diverted fighter-bombers to other missions at the expense of CAS (Futrell, <u>Ideas</u>, vol. I, 308).

<sup>24</sup>This work will not address most of these fights, but suffice it to say the Army, Navy, and Marines launched bureaucratic campaigns against the Air Force CAS system due to its real and perceived failures. Marine air's star turn during X Corps' Chosin retrograde conclusively settled matters for many soldiers. For these later incidents, see Isenberg, 266-267; and Millett, "Korea," 373, 377-383, 387-392, 396-398.

<sup>(</sup>fundamental differences in Air Force and Marine CAS development); Michael Lewis, "Ned Almond," 84-88; and Millett, "Korea," 365-37. Admiral Thach quote is from interview of ADM John S. Thach, USN (ret.) by CDR Etta-Belle Kitchen, USN, (U.S. Naval Institute Oral History Program), 533, cited in Hallion, <u>Naval Air War in Korea</u>, 78. Hallion discusses the comparative ground attack advantages and disadvantages of jets and props (81-84, 151-154), but seems to favor jets (151, 291, 296). The propeller planes carried heavier loads, were more maneuverable, and could loiter longer. The jets could strike quickly and with little warning. The propeller planes had greater loss rates but had better accuracy than the jets. The Skyraider was much better than the Corsair in loadcarrying capacity and survivability (89, 151-152). Ironically, Hallion favors the CAS mission much more in this book than he does in his other works. He also cites the soldiers' favorable impression of Marine CAS (87).

Force Secretary Thomas Finletter and Army Secretary Frank Pace allowed the Army to use these new aircraft, but stipulated that the Army could not duplicate Air Force fixed-wing missions; its aircraft would perform their roles only close to the front lines; and its fixed-wing planes still retained a weight restriction. Casting an eye at the Soviet presence in Europe, and fearing that they would fight outnumbered in any future war there, the Air Force stood firm in its desire to have multirole fighters. And taking advantage of the Army's lack of a coherent plan for handling air assets, Air Force leaders convincingly quashed the budding Army desire for its own attack planes.<sup>25</sup>

The Air Force later continued to bend results to its liking. Its Korean War accounts emphasized Army leader praise for the airmen instead of the earlier controversy or the continued simmering discontent. Likewise, the airmen and their chroniclers insisted that jet CAS performance improved with increased mission exposure, which meant the service's choice of fighter jets was correct all along. (Korean jet-compatible bases increased with rising U.N. fortunes, improving jet loiter time.) Further, they asserted that jets carried bigger weapons loads, suffered fewer losses, and could fly other missions if needed.<sup>26</sup>

<sup>&</sup>lt;sup>25</sup>Air Force counterefforts are from Millett, "Korea," 368-369, 371-373, 375-377, 383, 388-390, 397; and the Pace-Finletter Agreements are from Goldberg and Smith, "Army-Air Force Relations," 9-12. Army leaders' CAS quality opinions featured mixed opinions instead of unified dissatisfaction; see McLennan, "Close Air Support History," 47-50; and Goldberg and Smith, "Army-Air Force Relations," 10. Air Force multirole fighter stand in these proceedings is from Davis, <u>31 Initiatives</u>, by 11-12. Friction over Army helicopter use is from Bradin, 83-85; and Goldberg and Smith, "Army-Air Force Relations," 10. Marine Reserve CAS plane advocate, COL J.H. Reinburg, noted the Air Force's predilection for jet CAS, the Korean War consequences, and the Army's subsequent discontent in his "Trials of Close Air Support Aircraft," <u>Army</u> 16 (March 1966): 66-67. Interestingly, Worden claims that friction existed between Air Force bomber leaders and fighter leaders over how the war should best be fought; see Worden, <u>Fighter Generals</u>, 42-43. This may be so, but it certainly did not stop both factions from uniting against the Army.

<sup>&</sup>lt;sup>26</sup>For Army praise citations, as well as continued Army leader ambivalence, see McLennan, 48-50 (Army criticism, and includes future TAC commander GEN Gabriel Disosway's assertions in a 9 May 1963 speech to the American Ordnance Association that tactical airpower stood the test of Korea); General William Momyer's testimony in Senate, <u>Close Air Support</u>, 29 October 1971, 186 (cites army leader praise); and Futrell, <u>Korea</u>,

But some of these claims failed to stand scrutiny. Fighter jet pilots required diversion from their other missions to master CAS, something hard to do given their planes' characteristics. Also, one could not count on having just the right kind of bases for the jets. The airmen downplayed the F-51's accomplishments by emphasizing its loss rate performing CAS. The F-51 still had the same vulnerability problem that hurt it in World War II. Its in-line cylinder engine relied upon a coolant system that was too vulnerable to small-arms fire. Had the P-47 with its rugged construction and air-cooled radial engine been used, the loss rate might have been lower. The Air Force leaders still preferred fighter-bombers because they wanted planes that "could function better in contested air space." But they committed their F-86 (see Appendix Fig. 15) interceptor jets to clear Korean skies, while the F-80s and F-84s could not out-perform the MiG-15s they occasionally encountered on interdiction missions. Indeed, the propeller-driven AD-1 Skyraider used by the Navy and Marines could not defeat MiGs either, but it could outturn them and thus had a chance to defend itself.<sup>27</sup>

And speaking of vulnerabilities, Air Force historians included Korea CAS losses as yet another example of the mission's relatively high battle cost. However, a recent Korea CAS historical study stated that no conclusion about CAS losses in that war was possible

<sup>704-708 (</sup>these pages are Futrell's summary of Korea air support). The "Tactical air support" index entry in Futrell's <u>Korea</u> contains four times as many "praise" references as "criticism" references (<u>Korea</u>, 816). For the rest of the paragraph items, see Millett, "Korea," 375-377, 394-395.

The service continued to portray Korea as a vindication of fast jet CAS. In a later CAS plane controversy, Air Force Pentagon staffer, LTCOL Bruce Carlson, did so in his "Close Air Support," <u>Military Review</u> 69 (June 1989): 52-53. This earned a letters editor rebuttal from Air Force MAJ Roger Kropf, in "MR Letters," <u>Military Review</u> 69 (October 1989): 90 (Kropf had written on Korean War air power issues).

<sup>&</sup>lt;sup>27</sup>MAJ Raoul Archambault, USA, and LCDR Thomas Dean, USN, "Ending the Close Air Support Controversy" (Research paper, U.S. Naval War College, 1991), 19-20 (also rebuts Carlson); Larry Davis, <u>MiG Alley: Air to Air Combat Over Korea</u> (Carrollton, Tex.: Squadron/Signal Publications, 1978), 11, 15, 23; Dorr, <u>Skyraider</u>, 88; Millett, "Korea," 362-363, 394 (quote); Kropf, "MR Letters," 90; and Werrell, <u>Archie</u>, 75-81. Prop planes occasionally bagged MiGs whose pilots got overconfident or careless (Davis, <u>MiG Alley</u>, 23).

because flight records did not differentiate between air support close to the battlefield, and the interdiction missions against army reserves the Air Force favored. Another observer intimated that part of the loss-rate problem---if there was one compared to strategic bombing and interdiction---was due to tactics. To reduce casualties, air leaders ordered their pilots to release their weapons at higher altitudes to avoid the heavy small arms fire. This hindered weapons accuracy somewhat, but also reduced losses. It also applied to *both* propeller and jet planes, thus belying the Air Force claim that the faster jets somehow outran concentrated antiaircraft fire in their weapons runs. And since Navy leaders were not as concerned with the hypothetical airfighting prowess of their tactical planes, they weighed down their Skyraiders with protective armor to reduce small arms damage.<sup>28</sup>

The lessons the Air Force wanted to take from this war were not conducive to maintaining what CAS capability they established during its duration. The man who eventually commanded the air forces in Korea, O.P. Weyland of France fame, seemed fixated upon interdiction as a war winner. When that did not happen, he and other Air Force leaders complained about the war's idiosyncrasies compared to what they encountered in World War II. Though he once commented that it seemed his service forgot all its World War II lessons in Korea, he in turn chose to forget that interdiction did not work in all of the earlier war's situations either. It failed in Italy when the lines

<sup>&</sup>lt;sup>28</sup>Futrell, <u>Ideas</u>, vol. I, 350 (cites Korean War Air Force leader, BGEN James Ferguson's, preference for interdiction, given a straightforward profit-and-loss assessment); Hallion "A Retrospective Assessment," 18 (similar conclusion as Ferguson, but see his <u>Naval Air War in Korea</u>, 307, for a more CAS-favorable opinion); Millett, 395-396 ("recent" study); and Werrell, 75-76.

Werrell cites an interesting Air Force use of statistics. The difference between F-51 and F-80 losses was 1.9 percent and 0.74 percent, respectively; and though any loss increase should be avoided, the Air Force used this one percent difference to say the prop plane losses were three times the losses of the jets. Furthermore, the issue of vulnerability versus survivability arose here. Werrell mentions that the Navy's F4U prop planes took more hits than its F9F jets, but fails to say if these hits produced a correspondingly higher loss rate (Hallion did not discuss loss statistic methodology in <u>Naval Air War in Korea</u>, though Navy/Marine Corsairs and Skyraiders did experience much higher losses than their Navy/Marine jet counterparts; see p. 287). The "other observer" is Werrell, 76-81. The Navy's actions with its Skyraider planes are from Dorr, 88; and Isenberg, 265.

solidified, and it failed in the latter stages of the Korean War when, for both political and military reasons, the lines also stabilized. In both cases the enemy had reduced need for supplies at the front, and the communists also performed feats of primitive repair and transportation skill which undid air efforts designed for a more industrially developed enemy. But rather than recognize that shifting circumstances in war required different mission emphases, Weyland and the U.N. commander, Army General Mark Clark, praised the failed interdiction campaign for preventing further communist offensives as well as applying pressure for an armistice. It may have done these things, but other Army commanders still called for more CAS to cover the "routine" assaults and counterassaults that their citizen-soldiers experienced in the late war jockeying for Korean real estate.<sup>29</sup>

Instead, the Air Force report on Korea stated that the "lavish" CAS seen in this war was "unlikely to exist in future wars." As for the war being a model of future tricky conventional conflicts facing the world's Defender of Democracy, the Air Force simply dismissed its relevance. Air Force Secretary Thomas Finletter declared it was "a special case, and airpower can learn little from there about its future role in United States foreign policy." And still looking from Korea to the large Soviet presence in Eastern Europe, the report asserted that in the future, the Air Force would require an all-out effort to gain and maintain air superiority. If the Air Force faced an enemy of superior numbers and equal quality, its future vision could well be true. But there were so many other contingencies, and the service ignored them all throughout the rest of the fifties.<sup>30</sup>

<sup>&</sup>lt;sup>29</sup>Weyland's attitudes and interdiction's Korean War triumphs and failures are from Fedorchak, "Repeating the Past," 24; Futrell, <u>Ideas</u>, vol. I, 341 (U.N. commander, General Mark Clark, wanted interdiction as a means of applying pressure without sacrificing American troops); Futrell, <u>Korea</u>, 700-704. Further commentary on Korean War air interdiction is in Armitage and Mason, <u>Air Power in the Nuclear Age</u>, 26-27; Hallion, "Retrospective Assessment," 14-15; Isenberg, 269-272; Kropf, 40-41; Mark, "Korean Interdiction Campaigns of 1951," chap. in <u>Aerial Interdiction</u>, 287-319 (mentions that many Air Force interdiction missions could also be costly, and that F-51s flew these missions as well as CAS); and Maslowski and Millett, 523-527.

<sup>&</sup>lt;sup>30</sup>Finletter quote is from Earl Tilford, <u>Setup: What the Air Force Did in Vietnam</u> and Why (Maxwell AFB, Ala.: Air University Press, 1991), 21. Tilford quotes Air Force officers of that time who stated that they wanted no future part of such wars because these

# The "New Look" and the Air Force's Separate Path

However, most Americans thought Korea was abnormal. As one Army historian put it, that service seemed to be in a "fit of pique" as it discounted "victory" as a limited war objective in the 1954 version of its operations doctrine manual. Even General Matthew Ridgway, a later critic of the nuclear-centric American defense policy, asserted in 1953 that "War, if it comes again, will be total in character."<sup>31</sup> Americans preferred the general war and total victory of the World War Two variety, and scorned the uncomfortable limited fights that were the price of globalism. The new Eisenhower administration satisfied their desire with a defense policy called the "New Look."<sup>32</sup>

Featuring fiscal cutbacks and reduced forces in most services while pinning its budget dollars and defense hopes on U.S Air Force Strategic Air Command's (SAC) big bombers, the New Look was supposed to deter aggression at any level via the threat of nuclear annihilation. As such, the policy bolstered the Air Force bomber-background leadership's single-minded, technologically distorted, warfighting view. Indeed, in spite of the claim that this defense posture could thwart enemy efforts at any level of warfare, Air Force doctrine at the time assumed total wars against fully industrialized nations like the Soviet Union. Arthur Hadley witnessed an Air Force bomber general advance this policy

wars did not fit the service's warfighting preferences. Air Force report quote and observations are from U.S. Air Force, Far East Air Force, "Far East Air Force Report on the Korean War," vol. I, 126, cited in Futrell, Ideas, vol. I, 346-349, 351. For what this meant for Air Force doctrine, see COL Dennis Drew, USAF, "Two Decades in the Air Power Wilderness: Do We Know Where We Are?" <u>Air University Review</u> 37 (September-October 1986): 4.

<sup>&</sup>lt;sup>31</sup>COL Harry Summers, USA, <u>On Strategy: The Vietnam War in Context</u>, (Carlisle Barracks, Pa.: U.S. Army War College Strategic Studies Institute, 1981), 41. Another observer who describes Air Force and national dismissal of the war is Mrozek, 14-17, 22.

<sup>&</sup>lt;sup>32</sup>CAPT Budd Jones, USAF, "Flashblind: The Tactical Air Command's Capability for Close Air Support between the Korean and Vietnam Wars," in <u>Proceedings</u>. <u>Symposium: Air Support</u>. Jones considers dissatisfaction with Korea as one of the driving factors in New Look policy and the Air Force's reliance on SAC's bombers).

in a speech at the very conservative and pro-military Texas A&M University. He wondered at the audience response until a fire broke out in an ashtray and a wag blurted, "For God's sake, get rid of that ashtray . . . before the general drops an H-bomb on it." The SAC commander, General Curtis LeMay, was singularly unapologetic about his nuclear bomber beliefs. At times he asserted that the Air Force should give its tactical planes to the Army.<sup>33</sup>

Obviously, such overall leadership attitudes wreaked havoc upon conventional tactical aviation within the Air Force. The director of Air Force intelligence made an observation reminiscent of previous, and premonitory of future, "budget must match the doctrine" attitudes: "In this fast-moving age we no longer can build non-nuclear forces at the expense of our atomic strike and defense units."<sup>34</sup> The Korean War's results at least returned to TAC some of its independent status; but faced with bureaucratic extinction due to the pro-SAC national defense policy, the new TAC leader, O.P. Weyland, worked hard to secure nuclear capability for his planes. All accounts of the 1950s TAC mention its attempt to be a "junior SAC," as one historian put it. General T.R. Milton was then

<sup>&</sup>lt;sup>33</sup>The "New Look" and SAC's bombers are from several sources, such as Robert Buhrow, "Close Air Support Requirements: A Study of Interservice Rivalry" (Carlisle Barracks, Pa.: U.S. Army War College, 1971), 22-23; Drew, "Two Decades in the Air Power Wilderness," 6 (notes that Air Force doctrine actually assumed total wars against industrialized nations); Futrell, <u>Ideas</u>, vol. I, 419-423; Hadley, 103 (quote), 132-133; Jones, "Flashblind," 352; Maslowski and Millett, 544-551; Perret, 471-475; Tilford, 24-28; and Weigley, 399-410. LeMay's attitudes are from Hugh Ahmann, <u>LT GEN Marvin L.</u> <u>McNickle</u> (Arlington, Va.: USAF Oral History Program, 21 October 1985), 56, 60, 69-70, transcript, AFHRC, Holding K239.0512-1679 (McNickle was a TAC wing commander and staff officer during the 1950s, and was familiar with LeMay's opinion); Tilford, 39 (LeMay wanted TAC subsumed into Air Force-wide bomber command); and Worden, 81.

<sup>&</sup>lt;sup>34</sup>MGEN James Walsh, USAF, "The Influence of Nuclear Weapons on the Determination of Military Objectives," lecture, Air War College, MAFB, 18 December 1957, partially reprinted in Futrell, <u>Ideas</u>, vol. I, 464. Air University International Politics Professor Dr. Eugene Emme also observed that "the diversion to missions of limited war in support of . . . ground forces . . . inevitably weakens the strength of strategic striking forces." See Eugene Emme, "Some Fallacies Concerning Air Power," <u>The Air Power</u> <u>Historian</u> 4 (July 1957): 137.

commander of TAC's Thirteenth Air Force, and recalled that TAC units were "all trying to be little SACs with the primary mission being the nuclear one." And one leader who later figured prominently in the A-10's birth, General John McConnell, observed that "We did not even start doing anything about tactical aviation until about 1961 or 1962." Although it seems incredible now, Air Force leaders seriously believed that nuclear weapon-armed tactical jets would deter limited conflicts, and were ready to use nuclear weapons in limited conflicts if they occurred.<sup>35</sup>

This attitude duly affected tactical jet design. The Air Force's nuclear strike trend combined with its leaders' belief in greater high-speed performance to produce the "Century Series" fighters. Nicknamed thus because their designations ran in sequence from "F-100" to "F-106" (there was no operational F-103 model, however), the planes achieved the Air Force's dream of extremely high speed, but at the cost of maneuverability, fuel efficiency, and weapons-carrying capacity. The F-101, F-102, F-104, and F-106 were all primarily designed to intercept the anticipated incoming Soviet bomber fleets, and were not supposed to have air-to-ground capability. But the Air Force later asserted that the

<sup>&</sup>lt;sup>35</sup>Ahmann, <u>McNickle</u> 70-71; Fake, "Evolution of Close Air Support Doctrine," 9 (observes that the Air Force abjured all joint doctrine committees during this time); Futrell, <u>Ideas</u>, vol. I, 450-452, 468 (LeMay wanted bombers, not fighters, and loaded the Air Force Pentagon staff with SAC disciples); GAO, <u>Close Air Support: Principal Issues and</u> <u>Aircraft Choices</u>, Appendix I, 55-56; Head, 122-123 (Air Force tactical units reduced in the late 1950s); Hasdorff, <u>Hildreth</u>, 42-43, 56, 60-63; Jones, 346-347, 351-353 (some air leaders believed that nuclear weapons made armies practically obsolete, and reduction in the nuclear bomb's size also spurred TAC's nuclear orientation); David MacIsaac, "Voices from the Central Blue: The Air Power Theorists," in Peter Paret, ed., <u>Makers of Modern</u> <u>Strategy, from Macchiavelli to the Nuclear Age</u> (Princeton, N.J.: Princeton University Press, 1986), 644-645; John Sbrega, "Southeast Asia," in Cooling, <u>Case Studies</u>, 411; Tilford, 20-34 ("Junior SAC" quote, 32); Worden, 75-85; and Caroline Ziemke, "In the Shadow of the Giant: USAF Tactical Air Command in the Era of Strategic Bombing, 1945-1955" (Ph.D. diss., Ohio State University, 1989), passim.

Milton quote is from his article, "USAF and the Vietnam Experience," <u>Air Force</u> <u>Magazine</u> 58 (June 1975): 56. McConnell quote is from Sbrega, "Southeast Asia," 411. Nuclear-armed tactical air power's capabilities in limited war is from Futrell, <u>Ideas</u>, vol. I, 447-452, and 461-464 (LeMay believed that nuclear weapons applied not only to strategic situations but to all lesser cases). Air Force tactical attitude is also in Dick, <u>Disosway</u>, 197, 246.

F-100 and F-105 were fighter-bombers in the tradition of the P-47 and P-51 (for photos of the F-100, F-104, and F-105, see Appendix Figs. 16-18).<sup>36</sup>

These two planes' CAS suitability, as well as the fighter-bomber concept that implied their competence in that mission, were both debatable. The F-100 began its operational life as an air-to-air fighter, and its initial claim to fame was its ability to break the sound barrier in level flight. The Air Force, in its quest for speed as the determinant of air superiority, sacrificed maneuverability in the plane's design requirements. Only later would the service modify the F-100 to carry bombs, and even then the fighter lacked the fuel efficiency and payload capacity of such allegedly passé prop-driven attack planes as the A-1. In fact, the F-100's initial bomb load was a nuclear one since the size of such weapons had shrunk; the Air Force planned for the plane to use its speed to conduct a one-pass nuclear attack. The F-105 represented a more concerted TAC effort to enter the nuclear strike business. The service designed it to perform a supersonic low-level dash to the target, deliver its atomic payload, and streak away. As such, it excelled neither as an air-to-air dogfighter nor as a tactical air support plane.<sup>37</sup>

<sup>&</sup>lt;sup>36</sup>One harsh assessment of the "Century Series" comes from Hallion, "A Troubling Past," 9-10. Ironically, Hallion embraces the multirole fighter concept in his <u>Strike from</u> the Sky, 267, and his "A Retrospective Assessment," 20-25 (he apparently believes that the Air Force could build truly multirole planes). Other aviation historians who examined these planes are Bright, <u>Jet Makers</u>, 16-17, 68, 112; Futrell, <u>Ideas</u>, vol. II, 288; Bill Gunston, "North American F-100 Super Sabre," "Convair F-102 Delta Dagger," and "Lockheed F-104 Starfighter," chaps. in his <u>Early Supersonic Fighters of the West</u> (New York: Charles Scribner's Sons, 1976), 138-165, 166-183, 184-214; Neufeld, <u>Sprey</u>, 26; and Tilford, 31-34.

F-100 pilot and Air Command and Staff College student MAJ Thomas Barnes, in his "A Concept for Tactical Fighter Design," 16-19, 22, 36-37, cites three reasons why the air leaders assigned multiple roles to these jets: the "fighter-bomber" legacy of World War II; rising complexity and associated costs meant fewer planes to handle the various missions; and the nuclear mission that the fighter generals believed they had to accomplish to remain relevant.

<sup>&</sup>lt;sup>37</sup>Asprey, "Close Air Support," 35-36; Barnes, "Concept," 37-38; Buhrow, "Study in Interservice Rivalry," 22; Gunston, <u>Supersonic Fighters</u>, 146-147; Head, "A-7," 114-116, 157-158; Jones. 353-355; Benjamin Lambeth, "Pitfalls in Fighter Force Planning," RAND Report #P-7064 (Santa Monica, Calif.: RAND, 1985), 11-14 (does not

Yet the F-100 and F-105 could be made to do most anything, as their later Vietnam performance attested. The main factor which could ensure their competence in diverse missions was their pilots' adaptability. The task would be difficult, because the planes' cockpit visibility was poor and their very high delivery speeds and lack of maneuverability led to long slant-range weapons release parameters regardless of ordnance. For example, in order to provide safe escape from both the ground and the blast fragmentation effects of his own ordnance during dive pullout, an F-100 pilot had to release bombs five thousand feet above ground level (AGL) in a forty-five degree dive bomb delivery. This practical consideration of the laws of physics and aerodynamic design had several implications for the pilot. It limited his ability to gain and maintain sight of a ground target, and it raised the minimums of the weather required to visually maneuver to virtually clear days only. High attack speeds and longer slant ranges placed a high premium on precise aiming and correct release parameters, a task made more daunting by the primitive fixed-gunsight aiming apparatus these planes carried. And finally, a Century Series jet's pitifully poor fuel efficiency at low altitudes meant the pilot would have to find his target very quickly; something not likely since enemy troops might be camouflaged or moving, and he would be too fast or far away to see them at any rate.<sup>38</sup>

The fifties-era emphasis on the nuclear mission meant that the fliers themselves were not adaptable. Tactical units only sporadically practiced conventional air-to-ground weapons delivery and CAS, and the lack of proficiency appeared in poor weapons scores and exercise results. One Air Force officer observed after the 1958 Lebanon Crisis, a distinctly conventional military operation, that "There is considerable doubt ... as to the

want overly simple fighters, but criticizes the speed for speed's sake attitude in many Air Force designs); Brooke Nihart, "Sixty Years of Unresolved Problems," <u>Armed Forces</u> <u>Journal</u> 107 (25 April 1970): 20; Tilford, 33; and Buhrow, "Close Air Support Requirements," 19-20.

<sup>&</sup>lt;sup>38</sup>Goforth, "Do We Need a New Aircraft for Close Air Support?" 18-20, 23, 33-34. Century series aiming problems are from COL Eugene Deatrick, USAF (ret.), personal interview by author, 8 May 1997, Alexandria, Va., tape recording and notes in author's possession (Deatrick was one of the first graduates from the Air Force's test pilot school, and later was a squadron commander in Vietnam).

conventional combat capability of the F-100 units. Only a few of the F-100 pilots had strafed; none had shot rockets or delivered conventional bombs." One critic of Air Force fighter design philosophy who helped modify it in the 1960s and 1970s was Pierre Sprey. He later pointed out that just as stretching a plane's mission requirements hurt its overall effectiveness, increasing aircrew mission proficiency requirements hurt a pilot's effectiveness as well.<sup>39</sup>

Nonetheless, tactical air leaders clung hard to their desire for fast jet fighters that performed multiple roles, and several officers and observers later commented upon or were living examples of this almost dogmatic insistence. Air Force Major Richard Head's 1970 dissertation on that service's early-1960s purchase of the A-7 attack plane highlighted the increasing infatuation with multirole concepts throughout the 1950s and early 1960s, as well as the procurement attitude difference between the Air Force and the Navy (Head flew CAS in Vietnam and later served on the Pentagon staff). Besides Head, other experts pointed out that the Navy's widely varying combat situations bred specialization in aircraft mission design, which led to different career paths and combat philosophies for pilots. The Air Force's tactical men were nearly all fighter pilots with World War II backgrounds who focused mostly on the anticipated European smash-up with the Soviets. Available oral histories of Air Force generals who either were TAC leaders or were somehow involved in the 1950s and early-1960s fighter selection process confirm this observation. Most flew fighters in World War II and asserted that no tactical plane should be designed without air-to-air combat provess in mind, given intelligence assessments of Soviet air defenses.

<sup>&</sup>lt;sup>39</sup>Asprey, "Close Air Support," 33-34 (poor exercise results); Buhrow, "Close Air Support Requirements," 24-25 (minimal weapons delivery training and almost non-existent CAS training; made all the more compelling by the fact that author Buhrow was a research project officer for an air force study of its CAS procedures both before and during Vietnam); Dick, <u>Disosway</u>, 246-247 (poor weapons training); Jones, 354-356; Mason, <u>Air</u> <u>Power: A Centennial Appraisal</u>, 92; Neufeld, <u>Sprey</u>, 20-27; and Tilford, 36 (specifies TAC's poor conventional weapons training procedures and adds that "Dependence on nuclear weapons was the warp and woof of Air Force doctrine"). Quote is from COL Albert Sights, USAF, "Lessons of Lebanon: A Study in Air War Strategy," <u>Air University</u> <u>Review</u> 16 (July-August 1965): 42. MAJ Barnes observed that F-100 outfits neglected conventional weapons practice (45-46).

Remembering the successful fighter CAS of World War II, they likewise averred that any fighter could perform the air-to-ground attack mission.<sup>40</sup>

In the 1950s, the service was not shy about expressing its narrow-minded warfighting view to the Army, either. An Air Force general told <u>Army</u> magazine correspondent Robert Asprey that in future wars with communist nations, "we are going to need all the fast aircraft we have." Another officer told him: "The Air Force admits a tactical relationship and responsibility to the ground forces, but . . . . Our first priority is air defense. . . . [and] the Air Force can best serve the army by hitting the enemy in the rear area . . . . close air support is a maximum waste of firepower for the results gained." Still other Air Force leaders told the <u>Army</u> reporter that the F-100 was either perfect for CAS or that it had CAS mission weaknesses due to the need for aerial combat viability. Asprey's <u>Army</u> article appeared in 1961, and in it he expressed a rising Army exasperation with Air Force attitudes up to that date.<sup>41</sup>

<sup>41</sup>Quotes are from Asprey, "Close Air Support," 35 and 36.

<sup>&</sup>lt;sup>40</sup>Head, "A-7," 126-133, 156-160. For further discussion of Air Force-Navy tactical jet procurement differences, see CAPT C.O. Holmquist, USN, "Developments and Problems in Carrier-Based Attack Aircraft," in 1969 Naval Review, Frank Uhlig, ed., (Annapolis, Md.: United States Naval Institute, 1969), 195-196, 200, 211-212, and Neufeld, Sprey, 27. Air Force and Army Eurocentric planning orientation are from Builder, The Masks of War, 118-123, 136-142. The oral histories are as follows: Dick, Disosway, 181, 195-196 (Disosway served in various tactical air positions in the 1950s and was TAC commander in the early 1960s); Jack Neufeld, Interview of Brig Gen William F. Georgi, (Washington, D.C.: USAF Oral History Program, 5 June 1973), 3, 18-22, transcript, AFHRC Holding K239.0512-964 (Georgi worked in various procurement staffs); Lt Gen Robert G. Ruegg, (Washington, D.C.: USAF Oral History Interview, 13-14 February 1984), 139-140, transcript, AFHRC Holding K239.0512-1571 (extensive experience in Air Force aircraft procurement and research during this time; believed in tactical jet air-to-air superiority requirement); and Lt Gen Dale S. Sweat (Washington, D.C.: USAF Oral History Interview, 15 February 1984), 118, transcript, AFHRC Holding K239.0512-1572 (Sweat commanded various tactical air units in the 1950s and was later head of Air Force Plans Directorate).

### Army Discontent

It was not that the Army disagreed with many of the Air Force's warfighting concepts. One reason for Army leaders' incoherent attempts at revising the air support relationship in Korea was that they knew that some of the airmen's ideas were good ones. After all, one expected one's air force to gain and maintain air superiority, and if a state was engaged in an atomic superpower rivalry, it expected the means for executing atomic war, bombers, to be in top flight condition. Even Robert Asprey wrote in his <u>Army</u> article: "I think the free world owes SAC enormous gratitude." Some Army leaders felt that the airmen's strutting assertions of independence and superiority were justified given their pre-World War II travails and wartime vindication. Finally, their own Eurocentric warfighting orientation led some of them to accept the Air Force's rationale.<sup>42</sup>

However, they also increasingly believed that their Air Force brethren had strayed too far, especially regarding close air support and the planes the airmen claimed would perform it. Indeed, the service had not produced one dedicated CAS plane since its independence. Though not an Air Force pilot, Army Captain Asprey did common sense figuring to determine the F-100 and F-105's CAS suitability. He noted that these planes' lengthy takeoff and landing rolls reduced their runway suitability, which revived memories of the F-80 and F-84's Korean War problems. He also noted that their inability to maneuver at slow speeds increased their target acquisition difficulties. Above all, he saw these deficiencies amply demonstrated during exercises. Army leaders also saw the results.

<sup>&</sup>lt;sup>42</sup>Asprey, 35 (quote). Frederic Bergerson, <u>The Army Gets an Air Force: Tactics</u> <u>of Bureaucratic Politics</u> (Baltimore, Md.: The Johns Hopkins University Press, 1980), 44; Hadley, 84-87; LTCOL James Agnew, USA, <u>The Harold K. Johnson Papers</u>, vol. III, U.S. Army Senior Officers Debriefing Program, (Carlisle Barracks, Pa.: U.S. Army Military History Institute [henceforth cited as AMHI], 5 November 1973), 35-36, transcript of interview #14, Tape #2, AMHI; LTCOL Ronald Andreson, USA, <u>LTGEN George Seneff, USA (ret.)</u>, U.S. Army Senior Officer's Debriefing Program, (Carlisle Barracks, Pa.: AMHI, 1978), 71, transcript, History of Army Aviation Collection, AMHI; MAJ Charles Kirkpatrick, USA, "The Army and the A-10: The Army's Role in Developing Close Air Support Aircraft, 1961-1971," (Washington, D.C: U.S. Army Center for Military History Analysis Branch, 1971), 4-5 (Army concern for Europe and acceptance of Air Force's priorities).

Though they had not clearly articulated their discontent during the heat of war in Korea, a later survey of that war's Army officer veterans sent an unambiguous signal. Two-thirds to three-fourths condemned the Air Force CAS effort for lack of responsiveness and aircraft incompatibility. One Army leader who became one of the foremost helicopter aviation proponents, Major General Hamilton Howze, related how one 1950s Air Force live fire demonstration left him cold. A two thousand foot AGL broken cloud ceiling (relatively low clouds, but not overcast) with unlimited visibility underneath stopped one performance cold. Other attack runs were "dry" (no ordnance expenditure) because the pilots could not see the well-marked demonstration targets, and "hot" runs often missed the target because of the complexities involved in fast jet weapons delivery. Howze and others resented the way the airmen almost literally flew away from their CAS duties. They looked within their own service for a solution.<sup>43</sup>

#### The Army Acts

Control of air assets was the primary Army motivation for obtaining its own air service. The Air Force did not care to be at an Army commander's beck and call and, using one Army leader's later analogy, had set up an uncaring monopoly holding company for tactical air support. The Army used a budding aviation technology, the helicopter, to

<sup>&</sup>lt;sup>43</sup>Asprey, 35-36; James Coates and Michael Killian, <u>Heavy Losses: The Dangerous</u> <u>Decline of American Defense</u> (New York: Viking Press, 1985), 138-139 (observations about Air Force's policy and Army reaction); COL Jack Ridgway and LTCOL Paul Walter, USA, <u>GEN Barksdale Hamlett, USA (ret.)</u>, U.S. Army Senior Officers Debriefing Program, (Carlisle Barracks, Pa.: AMHI, 23 January 1976), 56-57, transcript, AMHI, (Hamlett was, along with Howze, another Army helicopter advocate); Goldberg and Smith, "Army-Air Force Relations," 45-46; McClennan, "Close Air Support Study," 68-70; MGEN Hamilton Howze, USA (ret.), "The Howze Board," Howze-Hawkins Family Papers, Draft Writings Articles Box, (Carlisle Barracks, Pa.: AMHI, n.d.), 10, 24, 25; and, from the same Draft Writings Articles Box, MGEN Hamilton Howze, "The Growing Vacuum," 3-4; Andreson, <u>Seneff</u>, 71 (Seneff, who was Director of Army Aviation in the mid 1960s, admits he initially favored Air Force independence, but became critical of its later ways).

GEN O. P. Weyland criticized his own service for its warfighting approach shortly after his 1959 retirement; see Worden, 85.

encroach upon that holding company's turf. And at times, Army leaders launched sporadic forays into the fixed-wing air support business.<sup>44</sup>

Helicopters proved their worth as flexible logistics aircraft in Korea. In one case they provided important resupply to help thwart an attack upon an exposed American flank. In 1954, the charismatic Army General James Gavin wrote an article entitled "Cavalry, and I Don't Mean Horses." Gavin had in mind rapid movement of troops via helicopters, something he and others considered necessary in modern war where weapons of mass destruction could annihilate massed, stationary army forces. He also believed that a sky cavalry could provide rapid strike and reconnaissance capability as horse cavalry did for armies of old. Referring to the late-autumn 1950 debacle in Korea, he wrote: "While some historians are lamenting the absence of Stuart at Gettysburg, no one has asked, 'Where was Walker's cavalry in Korea?'--and it is high time they did." But the sky cavalry, as its proponents called it, needed some form of armed escort to suppress enemy gunners. It was obvious the Air Force would not do this, so the Army explored its own air support options early after the Korean War.<sup>45</sup>

<sup>44</sup>Analogy is courtesy of GEN Robert Williams, USA (ret.), telephonic interview by author, 19 June 1997, tape recording and notes in author's possession. Williams was another pioneer of Army helicopter aviation, and emphasized that this dissertation must address the 1940s' and 1950s' interservice actions--the issue was always one of control. An Air Force officer partially involved in the A-10's design concept process who later became TAC commander, GEN Robert Dixon, USAF (ret.), stressed the same thing (telephonic interview by author, 13 April 1997, tape recording and notes in author's possession). Indeed, many of the cited Army-oriented sources carry this theme: Bergerson, Bradin, Kirkpatrick, and McLennan. The U.S. Air Force RAND study by Goldberg and Smith regarded control of air assets (47) as a central issue in the Army's development of organic aviation, given the Army's displeasure with Air Force intent and performance (45).

<sup>45</sup>BGEN John Bahnsen, USA (ret.), "A New Army Air Corps or a Full Combat Arms Team Member?" 123 <u>AFJI</u> (October 1986): 64; Bergerson, <u>The Army Gets an Air</u> <u>Force</u>, 72-75, 101-102; GEN James Gavin, USA, "Cavalry, and I Don't Mean Horses," <u>Harper's</u> 208 (April 1954): 54-60 (quote p. 54); Perret, 474 (asserts that the soldiers believed helicopters could have been decisive in warning of the late-1950 Chinese offensive); John R. Galvin, <u>Air Assault: The Development of Airmobile Warfare</u> (New York: Hawthorne Books, 1969), 254-257 (short discussion of early helicopter developments; though he did not use his rank on the book's title page, Galvin was an Army

As early as 1954, the Army tentatively explored procuring Cessna T-37 jet trainers (for photo, see Appendix Fig. 19), ostensibly for testing them in the observation and reconnaissance role. Further T-37 studies later helped raise Air Force suspicions about Army intentions, but other Army actions irritated Air Force leaders before then. Concerned not only about armed escort for their heliborne troop units but also about Russian tanks encountered in a European war, both Army aviation leaders and senior leaders explored helicopter antitank weapons usage. The initial tests, Able Buster and Baker Buster, were conducted in 1955 and yielded the not surprising result that more work was in order. The commander of the Army Aviation School at Fort Rucker, Brigadier General Carl Hutton and his Combat Developments Office chief, Colonel Jay Vanderpool, set to with gusto. Vanderpool urged aviation contractors to submit bids or improved helicopter models and conducted tests at Fort Rucker. Knowing that their work could be viewed as an infringement of the Pace-Finletter Agreements, they did their work informally in what Army aviation observer Frederic Bergerson called a bureaucratic insurgency. This testing method was almost literally hit and miss; such as when they learned in-flight that machine-gun firing shattered a certain type of plastic canopy. But the Army aviators got results, and by the time that service commenced the first of its large scale sky cavalry experiments in 1956, machine-guns in transport helicopter doors were commonplace. Furthermore, Vanderpool and his enthusiast subordinates--known as "Vanderpool's Fools"--began conducting helicopter firepower demonstrations for various Army units.<sup>46</sup>

Air Force officers witnessed many of these events and passed on their observations to the senior leadership, who in turn complained to Defense Secretary Charles Wilson.

LTCOL heavily involved in Vietnam airmobile operations); Richard Weinert, <u>A History of Army Aviation, 1950-1962</u>, U.S. Army Training and Doctrine Command (TRADOC), Historical Monograph Series, (Fort Monroe, Va.: U.S. Army TRADOC Office of the Command Historian, 1991), 181-187.

<sup>&</sup>lt;sup>46</sup>Bergerson, 70-81, 86-91, 99-110 (discussion of tests and insurgency); Bradin, <u>Hot Air to Hellfire</u>, 92-99 (armed helicopter efforts); Weinert, <u>History of Army Aviation</u>, 185-190 (various tests), 192 (door guns), 195 (more tests), 210-214 (T-37 studies); and Davis, <u>31 Initiatives</u>, 31 (Buster tests).

The Secretary already did not like the Army's attitude. During this time, that service's Chief of Staff, General Matthew Ridgway, resigned his post early due to differences over defense policy. There was also a "Colonels' Revolt" involving senior officers who publicly declared that the New Look sacrificed the Army's readiness. In an autobiography written shortly after his retirement, Ridgway issued the Air Force a warning about not producing dedicated CAS planes: "If they continue to ignore our needs in this respect, we will eventually have to develop them ourselves." In a November 1956 memorandum, Wilson sharply clarified--some Army men believed curtailed--Army flying activities. He extended the five thousand pound restriction on Army airplanes to include any special short-field capable plane, and he limited Army helicopter size to less than twenty thousand pounds. He warned the Army to honor agreements to limit its own aviation research and to rely upon the Air Force. Wilson did leave important loopholes that the Army men would later liberally use: he stipulated that the Defense Department could waive the weight restriction for certain aircraft models, and his memorandum left open to interpretation some restrictions on in-house aircraft development. Furthermore, Army carping about the terms led to Wilson's March 1957 Directive 5160.22, which warned the Air Force to meet its various agreed-upon obligations to the Army.<sup>47</sup>

Of course, the Air Force had no intention of honoring Wilson's policies, and so, neither did the Army. Their warfighting styles, based somewhat upon technology, did not at that time allow it. Colonel Vanderpool himself astutely observed: "Each advancement our air force made, separated it further in speed and distance from the army. The necessary differences in [the] mission of the air force and the army left a partial vacuum between [the] ground and the fringes of space." Indeed, joint talks between the services to

<sup>&</sup>lt;sup>47</sup>Dupuy and Dupuy, <u>Encyclopedia of Military History</u>, 1331(Colonels' Revolt); Perret, 472-475 (Wilson's attitude); and GEN Matthew Ridgway, USA (ret.) <u>Soldier</u> (New York: Harper Brothers, 1956), 315 (Ridgway's specifications required all-weather and night capability [read costly complexity seen in other night/all-weather planes] and had to be able to prevail against air defenses. This sounds like something that the Air Force wanted to produce all along). The directives are addressed in Bergerson, 55, 70; Davis, <u>31</u> <u>Initiatives</u>, 13-14 Directive 5160.22, reprinted in Wolf, <u>Basic Documents</u>, 317-323; Goldberg and Smith,, "Army-Air Force Relations," 12-14; and Head, "A-7," 120.

update CAS procedures developed during the Korean War broke down in 1957 over the Army's insistence upon, and the Air Force's rejection of, greater Army control of the CAS process. Proceeding onward, the Army successfully obtained Defense Secretary waivers for the AC-1 Caribou and the OV-1 Mohawk (for photo, see Appendix Fig. 20). The Caribou was a medium-sized transport which the Army used instead of the Air Force's tactical airlift. However, the Air Force would successfully stop the Army effort to use the Mohawk--a twin-turboprop plane ostensibly designed for observation--as a CAS plane.<sup>48</sup>

Meanwhile, the Army also spared no effort toward cementing its hold upon helicopter development. Aviation enthusiast leaders such as the late-1950s Director of Army Aviation, Major General Hamilton Howze, qualified many other Army leaders as pilots and thus created an influential clientele within the service. The Army aviators also ensured that their service established no separate aviation branch. This prevented a repeat of the old Army Air Corps sense of separateness and gave other service branches such as Armor a stake in helicopter development. The aviators continued to stage firepower demonstrations for their fellow troops, as well as various corporate, government, and political leaders. They also cultivated a political following among the congressmen in Fort Rucker's home state, Alabama.<sup>49</sup>

One development that had serious implications for the Army helicopter's fortunes was Bell Helicopter company's late-1950s creation of the jet-powered UH-1 (for photo, see Appendix Fig. 21). The "Huey," or "Slick," as its pilots later called it, enjoyed a major

<sup>&</sup>lt;sup>48</sup>Vanderpool quote is from Bradin, 95-96. Buhrow, 26-29, chronicles the doctrinal divorce over air support, while contemporary observations of it are from Asprey, 36-37; Buhrow, "Case Study of Interservice Rivalry," 23 (notes that in 1959, Defense Secretary Neil McElroy announced reduction of Air Force air support units due to Army's artillery missiles); COL Jules Gonseth, USA, "Tactical Air Support for Army Forces," <u>Military Review</u> 35 (July 1955): 3-16; and COL Gordon Moon II, USA, "Needed: Joint Doctrine on Close Air Support," <u>Military Review</u> 36 (July 1956): 8-13. Breakdown in negotiations is from McLennan, "Close Air Support Study," 54-55. Purchase of the Caribou and Mohawk is from Bergerson, 90-91; and Weinert, <u>History of Army Aviation</u>, 214-217.

<sup>&</sup>lt;sup>49</sup>Bahnsen, "A New Army Air Corps," 64 (recounts institutional efforts; with the creation of a separate Army Aviation branch in 1986, Bahnsen wonders if the aviators will act like their Air Corps predecessors); Bergerson, 79-80, 102-110.

performance advantage over piston-engine craft: it could go faster and carry heavier loads than they could. This also meant these aircraft could carry an appreciable ordnance load, for which other companies such as General Electric already agreed to build specially adapted weapons. Army leaders moved carefully in this regard, lest they excite another challenge from the Air Force. But they did develop and train with various weapons, even if it meant sneaking in Navy weapons experts to demonstrate how to properly set up weapons launchers and such.<sup>50</sup>

The Army's attitude and larger events started to put the Air Force on the defensive as the decade ended. A growing chorus of critics took aim at New Look policy problems. There were the defense intellectuals, a group of academics who during the fifties stepped in to provide some strategic guidance to the nuclear weapons-bedazzled 1950s military. Bernard Brodie, Henry Kissinger, and Robert Osgood all pointed out the strategic bankruptcy of a policy that chose massive nuclear assault as the answer to every world crisis. Army generals who retired in frustration over the Eisenhower administration's policies formed another group. Generals John Gavin, Matthew Ridgway, and Maxwell Taylor questioned the nation's ability to act if an aggressor did something that did not justify World War III. All of these criticisms either directly or indirectly attacked the Air Force which was so associated with the nuclear war outlook. Real world events such as the 1958 Lebanon Crisis lent credence to the critics' observations, as the United States discovered a limited capacity to undertake non-nuclear options. More ominous for the Air Force bomber men was the Soviets' radar-guided missile shootdown of a high-flying

<sup>&</sup>lt;sup>50</sup>Bergerson, 73 (weapons adaptation), 78, 89, 185; Bradin, 104; Galvin, <u>Air</u> <u>Assault</u>, 264, 315 (cites the turbine-powered UH-1 as a major catalyst in the development of heliborne airmobile operations); Stephen Peter Rosen, <u>Winning the Next War</u>: <u>Innovation and the Modern Military</u> (Ithaca, N.Y.: Cornell University Press, 1991), 90-91 (Rosen covers the Army's pursuit of helicopters on pp. 85-95); and Weinert, <u>History of</u> <u>Army Aviation</u>, 203-205.

American U-2 spy plane in 1960. This implied that the service's high-altitude, supersonic B-70 prototype was itself already obsolete.<sup>51</sup>

Thus the Air Force, which initially ridiculed Army helicopters while it focused upon an anticipated supersonic, stratospheric Trafalgar with the Russians, found its position under attack as the 1960s decade began. The Army developed armed helicopters and purchased planes which, in spite of a Defense Secretary waiver, violated the spirit of previous agreements. It continued to explore the capabilities of some T-37s it managed to purchase. As the year 1960 ended, the Army's Aircraft Requirements Board, chaired by Lieutenant General Gordon Rogers and known by his name, approved purchase of the UH-1, which would later figure so prominently in Army aviation. Indeed, by decade's end the Army possessed over five thousand aircraft.<sup>52</sup>

And if the Air Force thought that it would receive respite with the new presidential administration, it was mistaken. President John F. Kennedy and his advisors--one of whom was Maxwell Taylor--promoted a policy of flexible response. Unlike the New Look, this new policy envisioned fighting conventional wars that might require less than state-of-the-art technology. The new administration was also not afraid to stick America's nose into the kind of conflicts for which the Air Force was eminently unprepared.

<sup>&</sup>lt;sup>51</sup>Maslowski and Millett, 548-552; and Weigley, "Strategies of Deterrence and of Action: The Strategy Intellectuals," chap. in <u>The American Way of War</u>, 399-440. Good accounts of the B-70's difficulties come rom Brown, <u>Flying Blind</u>, 219-229; and Kotz, <u>Wild Blue Yonder</u>, 59-61.

<sup>&</sup>lt;sup>52</sup>Bergerson, 63, and Hadley, 136, discuss the Air Force's initial contempt for helicopters. Bradin, 97, 102-105, discusses continued Army helicopter weapons tests and the Rogers Board. Futrell notes that in 1960, at least one Army general publicly told the Air Force that his service needed a specialized plane, since the Air Force's planes no longer met standards; see Robert Futrell, <u>Ideas</u>, vol. II, 174. Sbrega, 413; and Davis, <u>31</u> <u>Initiatives</u>, 23, gives Army aircraft inventory (by comparison, the Army possessed three thousand aircraft at Korean War's end, and in 1960 the Air Force owned over twenty thousand planes).

# CHAPTER IV THE STAGE IS SET, 1961-1965

In the first half of the 1960s decade, activist Democrat presidential administrations challenged the Air Force's straitened warfighting view. Their confrontations with communists around the world convinced them that the American military needed the capability to wage war on higher intensity levels than the nuclear one for which it planned in the 1950s. Their various appointees within the Defense Department pressured the Air Force to procure planes and develop capabilities to meet tactical needs. The service resisted, but a variety of factors undermined its position.

Kennedy Administration officials let the Army provoke the Air Force by delivering ultimatums about CAS, investigating procurement of its own fighter planes, and above all, developing its helicopter fleet. The services embarked upon competing exercises, studies, and tests, but the harshest trial was the Democrats' most ambitious foreign policy project: the escalating war in Vietnam. The Army needed armed helicopters for various Vietnam combat roles, to include suppressing ground fire against troop helicopters. By 1965, it sanctioned contract study of an advanced attack helicopter while entertaining purchase of an interim attack helicopter from Bell Aircraft Company.

The Army's efforts shook an Air Force already embarrassed by the fact that the old propeller-driven A-1s it had obtained from the Navy to perform CAS in South Vietnam were outperforming supersonic jet fighter-bombers like the F-100. This and other Air Force CAS problems led Congressman Otis Pike (D-NY)--a former Marine dive-bomber pilot upset about the Air Force's unwillingness to support the Army and the nation's guerrilla war struggles--to convene hearings in which he exposed the service's lack of attention to air support. Air Force leaders tried to assuage the pressure from the Army, administration officials, and Pike by acquiring a subsonic Navy attack plane, the A-7. This move, unique for a service so wedded to buying supersonic tactical jets, was a precursor to its dedicated CAS plane purchase.

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## Kennedy, McNamara, and Their Whiz Kids Take Charge

"Let every nation know, whether it wishes us well or ill, that we shall pay any price, bear any burden, meet any hardship, support any friend, oppose any foe to assure the survival and the success of liberty." President John F. Kennedy spoke these words in his inaugural speech, and he soon backed them with deeds. Three months later, he failed in his attempt to overthrow Cuban leader Fidel Castro via surrogate invasion at the Bay of Pigs. Later that year, he stood firm against Soviet bullying in Berlin. Kennedy's foreign adventures stemmed from his "streak of romantic liberalism" and "missionary impulse," which combined with a desire not to be seen as soft on communism. The Bay of Pigs fiasco and the lack of an outright public success against communist regimes made Kennedy strive harder to prove his mettle. The 1962 Cuban Missile Crisis was one example, and his increasing involvement with Laos and Vietnam was another.<sup>1</sup>

These foreign policy actions also confirmed the Kennedy administration's growing conviction that America's military posture required reorientation toward more conventional means of warfare. The quickly evolving policy became known as "Flexible Response," and reflected the influence of one of the angry Army generals of the 1950s, Maxwell Taylor. Additionally, the Kennedy administration wanted more "civilianization" of top-level military affairs, particularly involving weapons procurement. Kennedy and his lieutenants were not alone in this opinion; increased weapons costs, interservice squabbles, "revolts," and other signs of military inefficiency irritated both Democratic and Republican leaders.<sup>2</sup>

<sup>&</sup>lt;sup>1</sup>Kennedy inauguration quote is from David Whitney and Robin Vaughn Whitney, <u>The American Presidents</u>, 8th ed. (Pleasantville, N.Y.: Reader's Digest Association, Inc., 1996), 309. Observation about Kennedy's foreign policy predilections is from Maslowski and Millett, <u>For the Common Defense</u>, 553. Other observers note Kennedy's increased desire for success after early stumbles; see Stanley Karnow, <u>Vietnam: A History</u> (New York: The Viking Press, 1983), 247-248; John Schlight, <u>The War in South Vietnam: The</u> <u>Years of the Offensive, 1965-1968</u>, The United States Air Force in Southeast Asia Series (Washington, D.C.: Office of Air Force History, 1988), 3; Tilford, <u>Setup</u>, 53-55; and Weigley, <u>American Way of War</u>, 450.

<sup>&</sup>lt;sup>2</sup>Karnow, <u>Vietnam</u>, 249-250; Maslowski and Millett, 554-555; and H.R. McMaster, <u>Dereliction of Duty: Lyndon Johnson, Robert McNamara, the Joint Chiefs of</u> <u>Staff, and the Lies That Led to Vietnam</u> (New York: Harper Collins, 1997), 2, 8-14.

The proud leader of the Kennedy assault on old-style military policy was his Secretary of Defense, Robert Strange McNamara. McNamara was a brilliant but arrogant man whose strong academic reputation led to World War II service as an Army Air Force operations analyst, and then to a meteoric rise to the presidency of Ford Motor Company. His background led him to believe that highly planned statistical analysis could determine any problem's most efficient solution. He and his Office of the Secretary of Defense (OSD) assistants--equally brilliant and sometimes arrogant academics whom he brought with him to help effect change--called the approach "systems analysis." Dubbed the "Whiz Kids," these assistants included Alain Enthoven, who headed McNamara's Office of Systems Analysis; and Harold Brown, John Foster, and John McNaughton, all of whom occupied various positions during their OSD tenure (Brown and Foster first served in the Directorate for Defense Research and Engineering [DDR&E]).<sup>3</sup>

McNamara and the Whiz Kids experienced decidedly mixed fortunes as they applied systems analysis to a wide range of military endeavors. Statistical validity depended upon good methodology, which in turn required understanding statistical formulae, the subject under study, *and* one's own biases. These people sometimes failed in the latter two tasks--shortcomings made especially glaring by their confident assertions that they would solve military problems better than the military leaders could. As one of the junior members of this group said of their efforts: "They could make a case for anything . . . [but] they made a case for a lot of bad things." Thus, McNamara and his Whiz Kids effectively streamlined the military budgeting process, but the Vietnam War was the more publicly remembered result of their quantification-over-strategy outlook. The same applied to military aviation; for though McNamara and his Whiz Kids seemingly favored a more

<sup>&</sup>lt;sup>3</sup>Maslowski and Millett, 554; McMaster, <u>Dereliction of Duty</u>, 18-21 (especially condemns Whiz Kid arrogance); Weigley, <u>The American Way of War</u>, 445-448; and Watson, <u>Secretaries of the Air Force</u>, 206-224. Deborah Shapley's <u>Promise and Power</u>: <u>The Life and Times of Robert McNamara</u> (Boston, Mass.: Little, Brown, 1993), summarizes the man's life and attitudes. For some of its details on McNamara's aims and the Whiz Kids, see 99-104, 112-113, and 192-196. McNamara speaks of his continuing faith in numerical analysis in his <u>In Retrospect</u>: <u>The Tragedy and Lessons of Vietnam</u> (New York: Random House, 1995), 4, 24.

conventional tactical air force, they often based their decisions on economic and statistical grounds instead of any real knowledge of tactical air warfare. He revealed his ignorance when he wanted the F-111 (for photo, see Appendix Fig. 22) to excel at most tactical missions for both the Air Force and the Navy–an aerodynamically impossible task. After the Air Force purchased the Navy's F-4 fighter (for photo, see Appendix Fig. 23) and temporarily redesignated it the F-110, he thought they were two different planes and publicly discussed their relative merits.<sup>4</sup>

In later interviews, Air Force leaders noted how McNamara and his Whiz Kids dismissed their expertise. But then military leaders often gave these people reason for contempt. General Curtis LeMay and most of the rest of the Air Force leaders clung tenaciously to their strategic bombers in spite of serious need for emphasis elsewhere. They answered Kennedy's interest in unconventional warfare by asserting that their forces must prepare for a worst-case, high-technology war and not squander effort on lesser

<sup>&</sup>lt;sup>4</sup>Quote is from Pierre Sprey, personal interview by author, 4 May 1997, Upper Marlboro, Md., recording and notes in author's possession. In his military reformist manifesto, <u>Straw Giant</u>, Arthur Hadley conceded some McNamara/Whiz Kid managerial successes while damning them for deflecting blame to the military when the analysis approach went awry in Vietnam (pp. 142-145, 155). COL Harry Summers, USA, made similar points in "Friction: The Bureaucracy," chap. in his <u>On Strategy: The Vietnam War</u> <u>in Context</u> (Carlisle Barracks, Pa.: U.S. Army War College, 1981), 27-32.

Descriptions of McNamara's high-handedness in the F-111 case, as well as the F-111's struggles, are in Bergerson, The Army Gets an Air Force, 191 (McNamara's confusion over the F-4/F-110); Robert Coulam, <u>Illusions of Choice: The F-111 and the Problem of Weapons Acquisition Reform</u> (Princeton, N.J.: Princeton University Press, 1977), 35-82, 98-100; Dick, <u>Disosway</u>, 297 (said it was supposed to "do everything . . . but cook breakfast"); Bill Gunston, "General Dynamics F-111," chap. in <u>Attack Aircraft of the West</u>, 170-208; Hadley, 147-156; Neufeld, <u>Georgi</u>, 18, 21 (McNamara's belief in the F-111's multiple capabilities); Shapley, "Controller of Technology," chap. in <u>Promise and Power</u>, 202-223; and Watson, <u>Secretaries</u>, 228-234.

GEN John McConnell was Air Force Chief of Staff from 1965 to 1969, and disliked the overwhelming influence of systems analysis: "Systems analysis gradually grew into an outfit that was dictating policy and strategy." See <u>Gen John P. McConnell</u> (Washington, D.C.: USAF Oral History Program, 28 August 1969), 32-33 (quote, 32), transcript, AFHRC Holding K239.0512-1190.

endeavors. And some leaders in both the Air Force and Army were only too willing to abandon military science for the systems analysis approach.<sup>5</sup>

## McNamara, the Air Force, and Tactical Aviation during the Kennedy Years

From the outset, McNamara pushed the Air Force toward a more conventional war orientation. His first budget plan for the service reduced funding for its beloved strategic bombers—and later, on his advice, President Kennedy let the troubled B-70 program die. Since CAS was a quintessential conventional war mission, McNamara likewise showed interest in it early on; in March 1961, he tasked the services to study development of a dedicated CAS plane. The Air Force gave a guarded response to this memorandum, with the leadership insisting upon the traditional multirole (especially air combat role) emphasis for any tactical plane design. In June, McNamara reviewed the services' response, and set forth his overall tactical aircraft philosophy. Characteristically, he wanted the Air Force and Navy to buy the same fighter and attack plane when they replaced their existing models. He wanted the fighter, initially called TFX and later the F-111, to be supersonic

<sup>&</sup>lt;sup>5</sup>Numerous Air Force interviews revealed serious Air Force leader resentment of McNamara. They are: Dick, <u>Disosway</u>, 205-207 (McNamara's arrogance led to errors, but many officers went along with him); Jack Neufeld, <u>Interview K239.0512-857 of Lieutenant General C. Agan, USAF (Ret)</u>, (Annapolis, Md.: USAF Oral History Program, 2 October 1973), 18-20, transcript, AFHRC Holding on title (Agan worked Air Force fighter procurement issues and recalls Whiz Kid arrogance); and <u>LT GEN Carlos M.</u> <u>Talbott</u> (Washington, D.C.: USAF Oral History Interview, 10-11 June 1985), 108-109, 111, transcript, AFHRC Holding K239.0512-1652 (Talbott served with the Pentagon Joint Staff, and appreciated some of the McNamara reforms but hated the condescension).

Drew, "Air Power Wilderness," 5-7; Robert Futrell, <u>Ideas</u>, vol. II, 48; McMaster, 42-45; Tilford, <u>Setup</u>, 48-50; and Worden, <u>Rise of the Fighter Generals</u>, 107-155, all recount LeMay and his Air Force's devotion to bombers in spite of the Kennedy administration's irritation. Air Force response to unconventional war emphasis is in Futrell, <u>Ideas</u>, vol. II, 56-57 (this section extensively quotes Air Force Deputy Director for Plans, BGEN Jerry Page's 24 April 1962 Position Paper, "The USAF Concept of Limited War." In Footnote 4, Hadley, McMaster, and Summers cited McNamara's contempt for the military profession, but added that many military officers went along with his management approach. Builder, <u>Masks of War</u>, 19, 104-109, 119, asserts the Air Force's technological orientation leads it to strongly embrace systems analysis.
and multimission capable. This pleased Air Force leaders, since they felt it was time to replace their beloved F-105, and they insisted upon multirole tactical planes anyway. Indeed, TAC commander, General Walter Sweeney, said that "In fighter aircraft, we need greater versatility," and stated his hope that the F-111 would answer his needs. But Navy air admirals wanted an aircraft which excelled at one mission instead of being merely acceptable at several. (Also, they wanted a plane which was not too large, too heavy, and too fast in takeoff and landing to be aircraft carrier-suitable, which the F-111 was.) The Navy eventually rejected it but the Air Force later used as an all-weather bomber.<sup>6</sup>

McNamara referenced his March 1961 tactical aircraft study directive in his June 1961 response; see Robert S. McNamara, Secretary of Defense Memorandum for the Secretaries of the Navy, Army, and Air Force, SecDef Cont. No. C-595, 7 June 1961, (from A-10 monograph supporting document copies that author purchased from Headquarters Air Force Material Command Historical Office, Wright-Patterson AFB, Ohio, henceforth called "supporting documents"). Initial Air Force response by Air Force Secretary Eugene Zuckert is quoted in McLennan, "Close Air Support Study," 63. The McNamara 7 June response memo speaks of an attack plane to replace the F-105 and A-7. The A-7 did not exist at the time of the memo. Edward Mishler, "The A-X Specialized Close Air Support Aircraft: Origins and Concept Phase, 1961-1970," (Wright-Patterson AFB, Ohio: Air Force Systems Command Office of History, 1977), 5, writes that it specified the F-105 and A-4, which makes more sense given the Air Force and Navy aircraft inventory of the time. The clarification is important because of the procurement infighting details recounted in this chapter. This author believes that "A-7" is a typographical error in this case.

Boston Globe writer Fred Kaplan makes a good point about the Air Force's infatuation with aircraft multi-role capability when he writes that Army generals and Navy

<sup>&</sup>lt;sup>6</sup>The Air Force, Navy, and McNamara preferences regarding the F-111 are from Barnes, "Concept," 46-47 (Sweeney quote, 46); Coulam, <u>Illusions</u>, 45-56, 90-96; Gunston, <u>Attack Aircraft</u>, 170-180; Lambeth, "Pitfalls," 13 (cites TAC's specification of supersonic attack speed for F-111 in order to make it better than the F-105); Shapley, "Controller of Technology," 202-223; and Tilford, <u>Setup</u>, 51-52.

Most of the first half of Shapley's McNamara biography recounts his impact upon the Department of Defense. Futrell summarizes the Kennedy administration's impact upon the Air Force in two chapters in his <u>Ideas</u>, vol., II; see "New Frontier: Redirection," and "AF in a Changing Environment," pp. 1-252. In his 4 May 1997 interview with the author, Pierre Sprey tersely assessed McNamara's approach to the service: "He just wanted a non-nuclear Air Force. That's about as deep as he got." Funding reduction and B-70 fate is in Michael Brown, <u>Flying Blind: The Politics of the U.S. Strategic Bomber Program</u> (Ithaca, N.Y.: Cornell University Press, 1992), 213-226; Futrell, <u>Ideas</u>, vol. II, 26-35; and Tilford, 47-50.

The TFX program revealed the services' differing concepts of tactical airplane design, and the differences were especially distinct concerning attack planes. In his June response, McNamara specifically told the services that he wanted a dedicated CAS plane. since "aircraft which are optimized for 'air superiority' missions are not fully effective in an air support role." Though McNamara specified that the prospective CAS plane would replace the Air Force F-105 and the Navy A-4 (for photo, see Appendix Fig. 24), his Whiz Kids explored making the A-4 an interim replacement for the F-105, since they considered the F-105 eminently unsuited for conventional attack missions. But given their affinity for supersonic, multirole tactical planes, Air Force leaders emphatically rejected the inexpensive, more agile, but subsonic A-4 when they felt they could do better keeping the fast F-105. One of the Air Force's Pentagon tactical issues staffers of the time, Colonel Gordon Graham, gave his service's fully evolved twenty-year attitude when he later said: "We hadn't bought an attack plane since World War II. The general doctrine ... is that those aircraft are not the kinds of machines that would survive in a sophisticated environment." On the other hand, the Navy encountered no problems with the little attack plane. They wanted it for a specific tactical role, it carried a surprisingly large underwing bomb load for a small plane, and such an external ordnance load aerodynamically prohibited supersonic flight anyway.<sup>7</sup>

To further guide the reluctant Air Force generals toward ditching the F-105, OSD Whiz Kids conducted a cost effectiveness study to determine the best attack plane from a

admirals never try to cram every tactical capability into all of their tanks and ships, but this approach is a "matter of course" for Air Force leaders; see Kaplan, "The Little Plane that Could Fly, If the Air Force Would Let It," <u>Boston Globe</u>, 14 March 1982, reprinted in <u>More Bucks, Less Bang: How the Pentagon Buys Ineffective Weapons</u>, ed., Dina Rasor (Washington, D.C.: Fund for Constitutional Government, 1983), 188-189.

<sup>&</sup>lt;sup>7</sup>Head, 157-158 (Graham quote is on page 158; Head interview with then-LTGEN Graham, 11 February 1970); McNamara Memorandum, 7 June 1961 (quote). The Navy's satisfaction with the A-4, and its specifications, are from Gunston, 234-236, 257 (explains that external ordnance carriage prohibits supersonic flight and a lot of external ordnance requires an equally high amount of thrust--read also fuel--to maintain even high subsonic speeds); and Holmquist, "Carrier Based Aircraft," 205-207.

list of candidate jets—some of which did not even remotely fit McNamara's preference for attack planes. On the simplistic basis of its ability to carry more ordnance longer distances, their study concluded that the supersonic Navy F-4 interceptor was the best attack plane. The Air Force liked this choice, since the plane was yet another ultra-fast fighter—and the service demonstrated its own mastery of the convenient uses of systems analysis when TAC staff produced a study condemning the A-4 and confirming OSD's choice of the F-4. McNamara revealed that his economic preferences could at times override his CAS plane design policy when he approved the Air Force F-4 as an interim CAS plane in late 1961. He liked the fact that the plane carried more weapons further than the F-105, that it would serve as a common fighter for two services, and that it possessed mission flexibility (the last item repudiated his June memorandum). He also praised it as a better CAS plane than the F-105, but that was not saying much. One pilot claimed that tactically maneuvering an F-4 was "akin to driving a dump truck in an obstacle course."<sup>8</sup>

Meanwhile, the Navy told OSD in March 1961 that it would proceed with plans to replace the A-4. Though the A-4 was a good plane, its fuel endurance and load carrying capacity were not what that service ultimately desired. Some Navy air leaders even

<sup>&</sup>lt;sup>8</sup>Head, 159-165, discusses McNamara's decision somewhat via block quotes of interviews he conducted with OSD staffers Alain Enthoven and Victor Heyman, and leans toward judging the decision as mostly economic. See also Glenn Bugos, Engineering the <u>F-4 Phantom II: Parts into Systems</u> (Annapolis, Md.: Naval Institute Press, 1996), 115-121, for more details of the service's F-4 buy. Tilford, 50-53, more forthrightly declares the F-4 decision efficiency-oriented.

F-4 maneuverability observation is from an unidentified Marine pilot in <u>MiGs</u> <u>Versus America</u>, produced and directed by Adam Friedman and Monte Markham, 45 min., U.S. News Productions in association with Perpetual Motion Films, 1993, videocassette. McNamara's opinion of the F-4 as a CAS plane is from Head, 216.

As another example of the Air Force's mastery of the systems analysis game, in spring 1962, its Systems Commands commander, Lieutenant General James Ferguson proudly told Congress that "exhaustive cost effectiveness studies" revealed that the F-4 was better at CAS than any dedicated plane; see Congress, House, Committee on Appropriations, <u>Department of Defense Appropriations for 1963, Part IV, Procurement</u>, 87th Cong., 2d sess., 9 March 1962, 321. Author's note: the A-4 remained in active Argentine Navy, Israeli Air Force, Singapore Air Force, and U.S. Navy service through the 1980s, serving both in attack roles and as a MiG-17 surrogate for fighter pilot training.

wondered if a supersonic plane would be better for the attack role--though they certainly did not think that the heavy F-111 fit the description. In one of those occasional cases where systems analysis and good military sense coincided, McNamara and his staffers ordered the Navy to do intensive analytical research to determine the plane's best possible design, which confirmed the Navy men's traditional attitude about speed versus fuel endurance and ordnance carriage. A supersonic plane cost too much and used too much fuel, especially when it flew low-level attack missions to evade enemy defenses. If it flew higher to conserve fuel and reduce the pilot workload involved in high-speed, low-level flight, its exposure to enemy defenses was just as great as that of the subsonic plane. The result was the subsonic VAL design, later called the A-7 (for photo, see Appendix Fig. 25), which offered exceptional range and ordnance carriage ability. McNamara's interim acceptance of the F-4 as an Air Force fighter-bomber meant that he and the Whiz Kids wanted that service to further study buying a CAS plane. The A-7 seemed to be that plane; but only after McNamara and company spent a few years attempting to reconcile the airmen and soldiers' view of CAS.<sup>9</sup>

## McNamara, the Air Force, and the Army, 1961-1965

The Army, especially its aviators, viewed Kennedy's inauguration with optimism. Thanks to Kennedy's increased conventional force funding in accordance with his "Flexible Response" defense policy, "Life in the army took on new meaning as soldiers once again felt appreciated." The policy change found the Army's aviators already redoubling their aviation expansion efforts into fixed-wing planes. Indeed, the Army General who served

<sup>&</sup>lt;sup>9</sup>Further Navy attack plane intentions, McNamara's directive for design research, and results, are from Gunston, <u>Attack Planes</u>, 234-237. McNamara's continued pressure on the Air Force about attack planes is from Defense Secretary Memorandum to the Air Force and Army Secretaries, 9 October 1961, "A Revised Program for Land Based Tactical Air," cited in Head, 216. Another source for the Navy's attack plane intentions, as they pertained to the A-7, is Holmquist, 208-210. Navy's opinion of TFX as an attack plane and ultimatum to OSD is from Assistant Navy Secretary for Research and Development Memorandum to Department of Defense Director of Defense Research and Engineering (DDR&E), 9 March 1961, quoted in Head, "A-7," 171.

as Chairman of the Joint Chiefs of Staff, Lyman Lemnitzer, recommended that a dedicated CAS plane be built. Two fixed-wing tactical jets emerged from Army studies as likely CAS plane candidates. The Fiat G.91 exemplified the problem with the Air Force's philosophy, in that Italy built an inexpensive, small, attack jet which some NATO air forces preferred to the Americans' high-speed, high-cost monstrosities. The F-5 (for photo, see Appendix Fig. 26) was an Air Force response of sorts to Army actions, as the service modified its sleek T-38 supersonic trainer to provide its impression of an inexpensive attack plane: a little hot rod fighter that possessed credible air-to-air performance at the cost of ordnance capacity and loiter time. The Army did not limit attack aircraft acquisition to fixed-wing jets; the Rogers Board which met in 1960 already sanctioned future study of armed helicopters.<sup>10</sup>

Air Force leaders did not ignore the change. Facing both McNamara's attacks on their bomber force size and a looming Army incursion into their CAS mission, they tried to maintain control through a ploy called Operation Menu. In early 1961, outgoing Air Force Chief of Staff Thomas White offered to dedicate to Army use eleven tactical squadrons equipped with planes chosen by the Army from a menu of candidate planes created by the Air Force. The Army refused the deal for a number of reasons; one was that the Air Force pushed the Army to choose the F-105. Another was that the Air Force wanted the Army to fund the operation, and the Army balked at the resources required. The Kennedy

<sup>&</sup>lt;sup>10</sup>Army optimism over Kennedy's accession to power is in Davis, <u>The 31 Initiatives</u>, 15; and Bradin, <u>From Hot Air to Hellfire</u>, 105 (quote). Army study of different jet types is from Weinert, <u>History of Army Aviation</u>, 214. Asprey, "Close Air Support," 37; Futrell, <u>Ideas, Vol. II</u>, 174-175; Morton and David Halperin, "The Key West Key," 119; and Schlight, <u>Years of the Offensive</u>, 88-90, all discuss the G.91 and F-5 (the Halperins claim that the Air Force blocked the Army's G.91 efforts throughout the 1950s). Rogers Board details are in Bradin, <u>Hot Air</u>, 103-105 (Rogers did not go so far as to embrace the ambitious sky cavalry proposals of one of his board members, aviation activist Hamilton Howze). Chuck Myers, personal interview by author, 1 May 1997, Alexandria Va., recording and notes in author's possession, also recalls Army work with armed helicopters at this time. (Myers was a civilian test pilot with ties to the Army).

people also removed some of the Air Force's initial apprehension when foreign policy events led them to expand the service's tactical force structure.<sup>11</sup>

If anything, Kennedy's increase of the Air Force's tactical force structure only increased pressure upon that service to meet its CAS commitment. Army leaders and aviation activists seized upon the administration's emphasis to *demand* air support--whether the Air Force or their own service accomplished it. An example came in spring 1961 when Army Chief of Staff General George Decker, in a final response to the Air Force's Project Menu ploy, issued a ringing declaration that became a quote in some Army histories: "The Army's requirement is to have close air support where we need it, when we need it, and under a system of operational control which makes it responsive to Army needs." These were strong words, but apparently because of Project Menu's results, General Decker demurred on asserting the Army's CAS plane choices.<sup>12</sup>

<sup>&</sup>lt;sup>11</sup>The Air Force's sales effort is in Bergerson, <u>The Army Gets an Air Force</u>, 108-109; Buhrow, "Case Study of Interservice Rivalry," 33; Goldberg and Smith, "Army-Air Force Relations," 17-19; and LTCOL Millhouse, USA (first name not given on document), "Briefing of President's Scientific Advisory Committee (PSAC) on Army's Requirements for Close Air Support," Final Draft, 21 November 1962, in McClennan, Tab F to Annex A. One account asserts that the Army's G.91 procurement study frightened Air Force leaders; see Gregg Easterbrook, "All Aboard Air Oblivion," <u>Washington Monthly</u> (September 1981); reprinted in <u>More Bucks, Less Bang</u>, ed. Dina Rasor, 56. Tactical force structure changes are in Futrell, <u>Ideas</u>, vol. II, 468-469; and Maslowski and Millett, 558-560.

In the John Tolson Papers, "Vietnam Diary, 1960-1968" Folder, at AMHI, Carlisle Barracks, Pa., is a 16 January 1961 briefing by then-Army COL Tolson to Air Force Chief of Staff Thomas White, and transcript of ensuing discussion. The list of attendees is unavailable, but the transcript indicates that Army and Air Force senior officers attended, to include Army Chief of Staff George Decker and Army aviation advocate Gen Barksdale Hamlett. Tolson presents the Army's plans for arming helicopters and in the ensuing discussion, Army officers mention their jet CAS plane study. White is suspicious of Army intentions, and there is a brief exchange about the Air Force's neglect and the possibility of an interservice fight if the Army pursues its plans.

<sup>&</sup>lt;sup>12</sup>The Army-perspective histories that contain this quote are Kirkpatrick, "The Army and the A-10," 11; and McLennan, "Close Air Support History," 62. Both also mention that General Decker failed to demand a voice in CAS plane selection. Futrell implies that Decker backed away because of the Project Menu; see <u>Ideas</u>, vol. II, 175.

McNamara further prodded the Air Force to study CAS plane procurement in an October 1961 memorandum. Air Force Secretary Zuckert replied in November by asserting that the Army was satisfied with the Air Force's aircraft choices, which obviously were multirole planes. Perhaps spurred by Zuckert's reply, Army Secretary Starr departed from General Decker's previous position and specified characteristics for an ideal air support plane. In short, he declared that the plane must possess short-takeoff-and-land (STOL) capabilities so as to closely follow the Army, good loiter and maneuverability for target area work, navigation equipment for bad weather, and radios for ground-air communications. Starr also disagreed with the Air Force Secretary's proposed CAS force size, and both issues produced an ongoing, formalized exchange of differing views called Project Cross Feed. The dialogue's one positive result was that it led McNamara in autumn 1961 to form Strike Command, a joint Air Force-Army organization intended to develop better procedures for such cooperative ventures as CAS.<sup>13</sup>

Army aviation activists in the Pentagon pushed beyond this debate when they drafted a memorandum that a sympathetic McNamara agreed to sign as his own. Published in April 1962, it was a virtual ultimatum to the Army leadership to take a "bold new look" at their mobility concepts and use of aviation. Army leaders readily assembled a pro-aviation study board under the redoubtable Major General Howze's chairmanship. It started work the next month and produced a report in August.<sup>14</sup>

<sup>&</sup>lt;sup>13</sup>McNamara's 9 October 1961 Memorandum is cited and discussed in Head, 216; Goldberg and Smith, 20; Kirkpatrick, 11-12; McLennan, 62. The exchange of service secretary views is from Goldberg and Smith, 19; Kirkpatrick, 11-15 (also mentions Cross Feed); McLennan, 64-66; and Millhouse, "PSAC", 3-4. Strike Command formation is from Air Force Secretary Harold Brown, "Secretary Brown Speaks About the Importance of Tactical Aviation," <u>Supplement to Air Force Policy Letter for Commanders</u> 12 (Washington, D.C.: Office of the Secretary of the Air Force [SAF] Internal Information Division [OII], December 1965): 1; Goldberg and Smith, 19.

<sup>&</sup>lt;sup>14</sup>Some accounts describe McNamara directing this study on his own initiative; see Bradin, 108 ("McNamara popped a lethargic army"); and Kirkpatrick, 15. Later research, and an oral history reveal something else: see Bergerson, 110-111 (at the time, Bergerson could not reveal his activist sources' names); Davis, 15 (the effort included sympathetic OSD staffers); Krepinevich, <u>The Army and Vietnam</u>, 119 (identifies Army GEN Robert

One "key" Howze Board officer's admonition to another member summed up its attitude: "Don't fart around. Go big. Don't ask for battalions, ask for divisions." Howze later wrote that resentment of Air Force neglect was one motivator for an around-the-clock effort that produced a sweeping final report filling over one hundred footlockers. It primarily contained annexes addressing coordinating agencies, but it reflected the aviators' air cavalry concept of large Army units travelling mostly by helicopter. Of course, these units would require protection as they advanced toward defended areas. Howze claimed that he still wanted the Air Force to provide heavy firepower support to such operations via traditional CAS. But his board spent a lot of time testing helicopter weapons employment, especially in the antitank role. Not only that, his report recommended that the Army use its OV-1 Mohawk twin turboprop battlefield reconaissance plane for CAS.<sup>15</sup>

The report's aggressive, ambitious tack shook even McNamara, who generally praised it while specifically criticizing its downplaying the logistic and fire support he expected the Air Force to provide. The Air Force's reaction was more hostile, for the Howze Board threatened its smug, nuclear bomber-oriented complacence. Howze permitted the Air Force to observe his board's actions, which helped that service more rapidly respond by convening a rival board named for its chairman, Lieutenant General Gabriel Disosway. The Disosway Board's report appeared barely a month after the Howze

Williams and COL Edwin Powell as memo instigators); Mishler, <u>The A-X</u>, 2 (McNamara "allowed" the Army to expand its role); COL Bryce Kramer, USA, and COL Ralph Powell, USA, <u>GEN Edwin Powell, USA (ret.)</u>, Senior Officers Debriefing Program, (Carlisle Barracks, Pa.: AMHI, 18 March 1978), 47-48, transcript, tape 1, side 1, History of Army Aviation Box, AMHI; and Rosen, <u>Winning the Next War</u>: <u>Innovation and the Modern Military</u>, 91-92 (provides a detailed account of Powell's and Williams's activities). The board's aviator-studded composition is noted in Bergerson, 111; and Davis, 16-17; as well as a journal article of the time, Larry Booda's "DOD Orders Army Shift to Air Mobility," <u>Aviation Week and Space Technology</u> 76 (25 June 1962): 26-27.

<sup>&</sup>lt;sup>15</sup>The Howze Board and its findings come from many sources. The most important is MGEN Hamilton Howze, "The Howze Board" (page sources for Air Force neglect, Board intentions, and report composition are 10, 22, 24-25, 37, 39, 46). Other good sources are Bergerson, 111-114 (quote and tempo); Bradin, 108-111(weapons tests); Davis, 16; Galvin, "The Howze Board: The Search for More Air Mobility," chap. in his <u>Air Assault</u>, 274-279; Goldberg and Smith, 20-21; and Head, 219-221.

Board report, and it attacked Howze's effort as an Army attempt to usurp Air Force missions. Concerning CAS, Disosway and other Air Force leaders believed that neither helicopters nor propeller planes like the Mohawk would survive in a high-threat environment. Disosway and his officers also used some of McNamara's systems analysis when they claimed that the F-4 could carry more ordnance faster than the Army planes. They had come to like the F-4's multirole capability, especially concerning air combat.<sup>16</sup>

The Cuban Missile Crisis occurred just as the two boards completed their work, and the event reemphasized to Kennedy and McNamara the need to fine-tune America's conventional capabilities. They did not have to worry about a lethargic effort from the Air Force and Army, for the open rivalry between the two services combined with OSD's efforts to generate an intense and somewhat disorganized attempt to resolve the roles-and-missions dispute. The next three years witnessed various memoranda, studies, exercises, and organizational shifts.<sup>17</sup>

<sup>&</sup>lt;sup>16</sup>Howze, "The Howze Board," 39, 56-57, mentions his including the Air Force in Board progress briefings, and his belief that the Disosway Board was a rebuttal. In his Air Force interview, General Disosway thought the Howze Board was an Army attempt to "Take it [tactical aviation] all back." He believed that his board's response was reasonable, since Army helicopter aviators "were going to lose their shirts . . . in the tac roles because they would easily be shot down" (Dick, Disosway, 176-178). Disosway Board member Marvin McNickle mentioned that Howze let Air Force officers observe the tests and examine the findings. He also said that the Disosway Board formed to rebut Howze's findings, and asserted that the Army "wanted their own tactical air force"; see Ahmann, McNickle, 91-92. Larry Booda, "USAF, Army Air Roles Evolving Slowly," Aviation Week and Space Technology 78 (27 May 1963): 30-31; and Futrell, Ideas, vol. II, 188, discuss McNamara's cautious response to both boards and their respective service's claims and counterclaims. Davis, 17-18; Goldberg and Smith, 21; and Head, 221-223, all either summarize McNamara's response or the Disosway Board's findings. Some Air Force leaders believed that the Howze Board exposed the bomber-dominated Air Force's lack of military intellectual development, but most stuck to the dogma; see Futrell, Ideas, vol. II, 182; and Mrozek, 16-20.

<sup>&</sup>lt;sup>17</sup>In his dissertation, MAJ Head believed the Cuban Missile Crisis and the competing service boards spurred Kennedy and McNamara to improve their conventional forces. Given the flurry of activity surrounding Air Force-Army battlefield cooperation, his observation seems quite valid; see Head, 223-224. Mrozek writes that Air Force leaders actually saw the Cuban Missile Crisis outcome as vindication of their strategic

In November 1962, the President's Scientific Advisory Committee (PSAC) convened to determine, among other things, the Army's CAS plane desires. But in spite of the Howze Board, the top Army leadership continued to move cautiously concerning CAS aircraft procurement, and gave an irresolute response. Helicopter technology was promising but unproven. And there were other CAS factors to consider besides the specific aircraft, such as command and control arrangements, which could possibly alleviate interservice CAS friction. Thus they stated that they agreed with the Air Force's determination of priorities while expressing performance preferences similar to those previously made by Secretary Starr. In the meantime, they created the 11th Air Assault Division (AAD) to further develop the Howze Board's helicopter concepts. The Air Force Chief of Staff, old bomber man General Curtis LeMay, continued to attack the Howze Board and helicopters' combat viability while asserting the Air Force's ability to meet Army needs. But LeMay also increased the size of the counterinsurgency unit that he had formed in 1961 both to satisfy Kennedy's interest in this type of warfare and to supply assistance to the South Vietnamese. LeMay also apparently hoped to keep the Army's helicopters from dominating future American counterinsurgency operations.<sup>18</sup>

McNamara continued his pressure for more interservice air support cooperation with a 16 February 1963 memorandum to the Air Force and Army Secretaries. He wanted a nonredundant meshing of the Army's growing airmobile capabilities with the Air Force's considerable logistic and firepower capacity, and thus directed further studies and exercises. From this, each service set up its respective Close Air Support Board, both of which issued reports in August 1963. Each wanted a plane fitting its view of CAS: the Air Force wanted a multipurpose fighter and the Army wanted a dedicated plane under its

warfare orientation (p. 18-19).

<sup>&</sup>lt;sup>18</sup>See Kirkpatrick, 14-15; and Millhouse, "(PSAC)," 1-12; for PSAC details. Davis, 18; Bradin, 111; Galvin, "The Airmobile Division: Tests of the Concept," chap. in his <u>Air Assault</u>, 280-288; and Head, 223; discuss 11th Air Assault Division purpose and actions. Futrell, <u>Ideas</u>, vol. II, 182, and Head, 220-221, recount LeMay's actions.

control. However, their findings and those of later tests would lead to other cooperative efforts.<sup>19</sup>

The top Army leadership remained cautious and continued to send contradictory signals about CAS in general and a CAS plane in particular. In March 1963, the Army Chief of Staff, General Earle Wheeler, requested that the new Army Secretary, Cyrus Vance, approve procurement of a dedicated attack helicopter. This was a departure even from the Howze Board's work, since that group mostly focused upon arming transport helicopters. Vance denied the request while, in the spirit of McNamara's edict that incited the Howze Board, telling the Army:

At the same time I want to emphasize that this disapproval is ... a signal to lift the Army's sights in its efforts to provide aircraft for the helicopter escort role. We must now press forward with speed and imagination to develop a more advanced weapons system that will more nearly approximately [*sic*] the optimum.

But given the Air Force's angry denunciations and plans for rival tests, Army generals did not at that time aggressively pursue Vance's guidance. Instead, they remained circumspect, making sure that their every move was justified and would not provoke the Air Force to commence interservice battle. As the Close Air Support Boards adjourned, Army Deputy Chief of Staff for Operations, Lieutenant General Harold Johnson (soon to be the Army Chief of Staff), even ordered an historical study to determine if CAS was really worth the effort. The study concluded that American ground commanders loved it in spite of any direct profit-and-loss analysis. And after the Army Close Air Support Board made its report, General Wheeler rejected its proposal for a CAS plane, and sent a policy letter to his commanders. In it, he asserted that the Army did not plan to create a rival air arm, and

<sup>&</sup>lt;sup>19</sup>See Robert McNamara, "Close Air Support," Memorandum for Air Force and Army Secretaries, 16 February 1963. For the Close Air Support Boards, see Futrell, <u>Ideas</u>, vol. II, 183; Goldberg and Smith, 23-24; Kirkpatrick, 16-20; and McLennan, 72. (His work dates from the time the boards were about to convene, and expresses a hope they will resolve CAS issues.)

in a semantic effort to sidestep previous agreements and thus avoid an ugly roles-andmissions fight over CAS, retermed helicopter fire support as "direct support."<sup>20</sup>

Wheeler's tendered olive branch and fig leaf renaming of helicopter CAS did not mean that he kept his service from competing with the Air Force. Under the Strike Command's overall direction, each service conducted separate preliminary exercises before starting a heavily monitored joint exercise in autumn 1964 called Gold Fire I. The results did not give either side a decisive advantage. The Air Force demonstrated prowess in combat area logistics and reconnaissance, which led to McNamara's cancellation of further Army purchase of the Caribou transport plane and OV-1 Mohawk surveillance plane. But

Bergerson believes that the Army top leadership strove to avoid open conflict with the Air Force since 1958 (p. 118). The attack helicopter request is from Head, 224. LT GEN Johnson's study is from Kirkpatrick, 20-21. LeMay sustained a verbal attack upon the Army's actions; see Futrell, Ideas, vol. II, 186-187.

COL James Agnew, USA and LTC Rupert Glover, USA, <u>GEN Harold Johnson</u>, <u>USA (ret.)</u>, Senior Officers' Debriefing Program (Carlisle Barracks, Pa.: AMHI, 23 April 1973 and 5 November 1973), 36-40, transcript of interview 12, tape 12 (23 April), 28-36, transcript of interview 14, tape 2 (5 November), The Harold K. Johnson Papers, Vol. III, AMHI, reveal Johnson's skepticism of CAS' affordability as well as his discomfort with the Army aviators' zeal. However, Johnson welcomed some agitation in order to enforce better Air Force and Army cooperation.

GEN Wheeler's reaction is quoted at length in MAJ Raymond Reeves, USAF, "Close Air Support, AH-56 VS. A-X: Doctrine Conflict between the Services," (Research Study, Air Command and Staff College, 1972), 10-11; see also Head, 225-226.

There is also a 16 January 1964 briefing in the Fort Rucker Papers (AMHI, Carlisle Barracks, Pa.), entitled "Army Views on the Use of Aerial Vehicles," source apparently the Army Aviation School and Center (AASAC), which repeats Wheeler's views. It defines CAS as large volumes of aerial firepower available to a commander courtesy of another service, and direct fire support as firepower delivered in close proximity to engaged ground units by organic Army aircraft. Furthermore, direct support aircraft would be simple, rugged, and integral to Army ground units, while other support aircraft would be multipurpose, not part of the Army, and available only part time. Apparently, the briefing was the end result of the leadership's attempt to control its aviators and fine tune its public stance. And it again reveals the Army leadership's ambivalence over the best way to conduct CAS, given the rapid advance of both jet airplane and helicopter technology.

<sup>&</sup>lt;sup>20</sup>Vance quote is from Memorandum from Secretary of the Army for the Chief of Staff, U.S. Army, "High Speed Helicopter Weapons System," 27 March 1963, reproduced in James Hessman, et al, "The Army Gets a New Weapons System," <u>Armed Forces</u> Journal 106 (14 December 1968): 7.

the Air Force failed to sell the Army on fast jet support; Air Force F-4s could not successfully escort slow-moving transport aircraft. The tests spurred some cooperation, however, as the Air Force relearned operations not seen since Elwood Quesada's days in France. The exercise and CAS Boards led the service to promise a more streamlined CAS operation and more forward air controllers.<sup>21</sup>

The rivalry was not over by any means. In May 1964, Chairman of the Joint Chiefs of Staff, General Maxwell Taylor, attempted to make peace by creating another interservice agreement which would divide aircraft between the services by design and function rather than weight. His effort spurred Secretary Zuckert and Air Force Chief of Staff LeMay to demand that the Air Force assume responsibility for all Air Force-Army aircraft operations. The Army and OSD rejected this move, but the Army was itself guilty of a similar attitude: Strike Command's commander, Army General Paul Adams, criticized his own service for a too-zealous and parochial view of airmobile operations. According to one source, there was some talk of disbanding the 11th AAD, though this might have been premature since a second Gold Fire test was planned. Neither action occurred, and one of the prime reasons was that in summer 1965, OSD sent the new unit--now designated the 1st Cavalry Division (Airmobile)---into a situation where one could determine its worth better than any test: the escalating war in Vietnam.<sup>22</sup>

<sup>&</sup>lt;sup>21</sup>Sorting out the mix of studies, tests, and agencies is a challenge, and this footnote's paragraph is a quick summary *only*. One finds daunting accounts in Bergerson, 114; Davis, 18-19; Futrell, <u>Ideas</u>, vol. II, 182-189; Goldberg and Smith, 21-23. Bergerson writes an account of Army aviation's "heroic" rise, and makes the exercises seem as if the Air Force desperately aped the Army. Davis's short description portrays the tests as virtually free-style competition. But the other two accounts make clear that although the tests were competitive, they--especially the joint Gold Fire test--were controlled by the joint-service Strike Command. The F-4s' problem with helicopter escort is from the above Futrell citation; and MGEN Benjamin Harrison, USA (ret.), telephonic interview by author, 27 June 1997, tape recording and notes in author's possession.

<sup>&</sup>lt;sup>22</sup>Goldberg and Smith, 22-27 feature the following items: Taylor's proposal and LeMay and Zuckert's brazen grab for total control; extensive quote of General Adams' opinion; exercise termination and orders to Vietnam; and Air Force opposition to airmobile division creation. Bergerson, 115; and Futrell, <u>Ideas</u>, vol. II, 189, are the 11th AAD disbandment sources. Other sources for exercise termination, unit redesignation, and

## Vietnam, 1961-1965

The growing American involvement in Vietnam highlighted the give-and-take occurring between the services concerning CAS. Long before the 1st Cavalry Division and mainstream Air Force units arrived in Vietnam, Air Force planes and Army helicopters delivered air support to ground units. The friction that characterized the services' stateside relationship transferred to their low intensity combat operations in Vietnam.

In 1961, the Air Force sent pilots, planes, and maintenance crews from LeMay's special air unit, the 4400th Combat Crew Training Squadron (CCTS, unit code name Jungle Jim). Under the operational code-name of Farm Gate, they mostly ran their own operation using South Vietnamese passengers as window dressing for what officially was declared an advisory mission. They used a World War II-vintage medium bomber, the B-26, and an almost equally old single-engined trainer-cum-attack plane, the T-28 (for photo, see Appendix Fig. 27) for fire support missions. They also had to borrow little spotter planes from the Army. Air Force leaders revealed their infatuation with World War II-style air superiority struggles when they delayed the T-28s' arrival so as to arm them with Sidewinder air-to-air missiles. (The upper levels of the American chain of command in Vietnam cancelled the effort since there was utterly no air threat in South Vietnam.) It was just as well, for both the T-28 and the B-26's old airframes suffered an increasing number of catastrophic inflight structural failures from the tactical maneuvering that did occur. The attack plane the Air Force increasingly had to use was plane with solid CAS credentials from the Korean War that they purchased from the Navy, the A-1.<sup>23</sup>

orders to Vietnam are Bergerson, 116; Bradin 111-112; Futrell, <u>Ideas</u>, vol. II, 189; and Reeves, 12. One of the other reasons for exercise cancellation was that the Joint Chiefs of Staff believed they had enough information.

<sup>&</sup>lt;sup>23</sup>Tilford, 63-67, 76-77; Sbrega, "Southeast Asia," in Cooling, ed., <u>Case Studies</u>, 420-425, 441; Schlight, 3-5; Neil Sheehan, <u>A Bright Shining Lie: John Paul Vann and</u> <u>America in Vietnam</u> (New York: Vintage Books, 1988), 64-65; and Congress, House, Report of the Special Subcommittee on Tactical Air Support of the Committee on Armed Services, <u>Close Air Support</u>, 89th Cong., 2d sess., 1 February 1966, 4863.

The Army sent a small helicopter detachment to Vietnam in 1961, but in spite of some of its aviators' belief that Vietnam would vindicate the Howze Board, the top leadership actually saw helicopters as better suited to high-technology conventional wars than to the counterinsurgency role. However, the aircraft proved their worth in battlefield logistics, supporting the unexpected fights that broke out in normally inaccessible locations. And in a development disturbing to the Air Force, they sometimes provided--or had to provide-fire support as they inserted troops into a landing zone. Unfortunately, they were vulnerable against defenses. Their main and rear stabilizer rotors needed to operate without serious dents or bends, and their engine-rotor gearboxes also could not work with any serious damage. The helicopter pilots' cocky attitude did not help their lack of true combat experience when flying these vulnerable machines in a defended area--a situation made increasingly unfortunate as communist gunners acquired proficiency and better weapons. Aviation units modified their logistics craft to provide armed escort for logistics missions, but even the jet-powered UH-1 could neither maneuver nor keep up with its charges when carrying heavy weapons. Helicopter unit commanders faced a dilemma of either lightly arming their escorts, which meant weak firepower, or carrying heavier armament and the attendant performance penalties. Thus, by 1964, Army aviators increasingly wanted a dedicated attack helicopter. Meanwhile, they experienced embarrassing losses in such fights as the 1963 Battle of Ap Bac and the 1965 Battle of Binh Gia. The Army's first serious fight with North Vietnamese regulars revealed its helicopters' inability to deliver heavy firepower support. At the Battle of Ia Drang in October 1965, an element of the 1st Air Cav met the North Vietnamese and, by the commander's later admission, Air Force airplanes and not his own modified helicopter gunships were primarily responsible for saving his men.<sup>24</sup>

<sup>&</sup>lt;sup>24</sup>The Army's conventional war orientation as it pertains to Vietnam and helicopters is from Buhrow, "Study of Interservice Rivalry," 40-42 (neither service was ready for a Vietnam-style conventional war); Krepinevich, <u>The Army and Vietnam</u>, 121-126 (asserts that aviator leaders envisioned using helicopters against a conventional communist Vietnamese ground force); and Donald Mrozek, <u>Air Power and the Ground War in</u> <u>Vietnam</u>, 76 (quotes Army leader reminiscences about their initial skepticism).

Army helicopter aviator confidence and negative results are from Dick, Disosway,

Early on, the airmen and the soldiers wanted to fight the war in their own way, which created tension within the American command. From 1963 through 1965, Air Force people in Vietnam complained that the soldiers who dominated the Military Assistance Command, Vietnam (MACV) staff ignored their concerns, which included an already snarled air traffic control system and unresponsive air support tasking network. Indeed, before retiring as Air Force Chief of Staff, General LeMay visited Vietnam and criticized the operation for not granting the Air Force complete control of all air assets in accordance with its doctrine. The situation changed as the exigencies of an escalating war demonstrated to both sides the value of cooperation.<sup>25</sup>

The war's escalation in 1964 and 1965 meant that Air Force leaders had a reason to send their supersonic jets and show that their service could win the war. "A squadron of F-100s over here could puncture the balloon of the skeptics," boasted one staff officer.

The Battle of Ia Drang was desperate at times, and the U.S. Army commander there, then-COL Harold Moore, later said that an important advantage for his forces was that they had firepower and the North Vietnamese did not--and that fixed wing tactical planes "helped provide that edge." See Joseph Galloway and LTGEN Harold Moore, USA (ret.) We Were Soldiers Once ... and Young, Ia Drang: The Battle that Changed the War in Vietnam (New York: Harper Perennial, 1992), 121 (quote in this footnote), 305-307.

<sup>25</sup>Relations between Air Force and Army commanders in Vietnam during the early years were bad, and featured struggles over air tasking and control even more complex than the interservice tussle occurring stateside. See Tilford, 68-70; and Sbrega, 418-431. Tilford believes the friction dissipated for three reasons: the desire to support the war effort and prevent needless loss of life; the Rolling Thunder campaign distracted the Air Force with an air war more to its liking; and new personalities in the air and MACV commander positions smoothed personal relations within MACV staff. (Air Force MGEN Joseph Moore was a boyhood chum of Army GEN William Westmoreland.)

<sup>179, 192;</sup> Easterbrook, "All Aboard Air Oblivion," 52-60; Futrell, <u>Ideas</u>, vol. II, 299 (cites belief that Vietnam would vindicate Howze); Sbrega, 423, 454-455; Schlight, 16; and Sheehan, <u>Lie</u>, 214-238 (pilot mindset and Ap Bac account).

The helicopters' problems carrying weapons, vulnerabilities, and the attendant desire for an attack helicopter, is from Bradin, 111-115 (Vietnam deployment date is on 12); Cecil Brownlow, "Burgeoning U.S. Use of Air Power Aims at Forestalling Ground War with Chinese," <u>Aviation Week & Space Technology</u> (henceforth known as <u>AW&ST</u>) (26 April 1965): 28-29; Rosen, <u>Winning</u>, 94 (notes communist gunners' increasing proficiency); Andreson, <u>Seneff</u>, 43-48 (Seneff was Director of Army Aviation in 1965 and noted the UH-1's lack of firepower and resulting need for something with more punch).

But the preferred interdiction/air-superiority campaign over North Vietnam (called Rolling Thunder) and the ground support effort in South Vietnam created frustrations because, as with the Korean War, the Vietnam War did not fit the airmen's preconceived warfighting notions. The interdiction campaign failed to stanch the communists' logistic flow because there were not enough planes to prevent a too-numerous and too-determined enemy from using the vast, mountainous jungle to its advantage. As with Korea's latter years when the battle lines froze, the Vietnam War's early escalation years featured an opponent who did not manufacture or transport the mass quantities of industrial war material for which interdiction is well suited. The Vietnam War also featured political limitations upon the air campaign against North Vietnam that President Lyndon Johnson's administration aggravated with its tactical stupidity (such as forbidding the airmen to attack the surface-to-air missile [SAM] sites and interceptor units set up to shoot them down). Indeed, though the North Vietnamese Air Force never remotely challenged American air superiority, its MiG interceptors--cheap planes that Air Force leaders would have considered unacceptable for their own service-used the Americans' self-imposed restrictions to conduct an aerial guerrilla campaign which occasionally brought down the big, expensive, supersonic jet fighter-bombers.<sup>26</sup>

<sup>&</sup>lt;sup>26</sup>Tilford, <u>Setup</u>, 79 (staff officer quote), 93-98 and 114 (recounts the airmen's eagerness to use jets). Tilford observes that the Air Force leadership was convinced that it could conduct a classic strategic bombing campaign against the North to break its will. Frustrated with the outcome of a 1964 Vietnam scenario wargame which later became reality, GEN LeMay insisted that the solution against the North Vietnamese was to "bomb them into the Stone Age" (LeMay quote in <u>Setup</u>, 98). Momyer believed that jets could accomplish any of the missions in Vietnam better than slower planes (<u>Setup</u>, 114). Dick, <u>Disosway</u>, 203; at least reveals that general's desire to get jets into the war. Schlight, 21, 61, 114, describes how LeMay's successor, GEN John McConnell, also wanted a strong airpower-based strategy, though he was not as vehement as LeMay.

However, things did not turn out that well. Works that reveal or discuss the Air Force's frustrations in Rolling Thunder are COL Jack Broughton, USAF (ret.), "In Spite of Command and Control," "And There Were MiGs," and "And There Were SAMs," chaps. in <u>Going Downtown: The War Against Hanoi and Washington</u> (New York: Orion Books, 1988), 83-108, 149-190; MAJ Mark Clodfelter, USAF, "An Extended Application of Force," and "Restraints and Results, 1965-1968," chaps. in <u>The Limits of Air Power: The</u> <u>American Bombing of North Vietnam</u> (New York: The Free Press, 1989), 73-146; COL

The Air Force supersonic jets that flew CAS in South Vietnam, predominantly the F-4, F-100, and F-105, earned their share of praise. In fact, over the years the Air Force's South Vietnam CAS operation became so efficient that observers both inside and outside the military commented that the Army relied too much upon it.<sup>27</sup> However, the fast jets

<sup>27</sup>John Sbrega's "Southeast Asia" chapter in Cooling's CAS anthology features praise for supersonic jets; saying of the F-100 and F-4 that they "carried the close air-support load" (p. 441). After he retired, GEN William Momyer wrote a history of tactical airpower as he had seen it, <u>Air Power in Three Wars</u> (MAFB: Air University Press, 1978). He believed that jets were better support machines (p. 270).

The soldiers' gratitude and some belief that they came to rely upon CAS too much are from Beaumont, Joint Military Operations, 152-153 (CAS success created a psychological dependence); MAJ Steve Bell, USAF, "Close Air Support for the Future," (Master's thesis, Army Command and General Staff College, 1992), 31-33; Dick, <u>Disosway</u>, 195; GAO, <u>Close Air Support: Principal Issues and Aircraft Choices</u>, Appendix II, 57-60; Hadley, <u>Straw Giant</u>, 182; Krepinevich, 170-171; Sbrega, 469 (quotes GEN Momyer's belief that abundant CAS availability was unrealistic); and Schlight, 216-217. Galloway and Moore, <u>We Were Soldiers Once</u>, 305-307, is one of the most dramatic examples. Indeed, beleaguered Army soldiers did not really care who delivered life-saving attacks, and the Air Force Project Contemporary Historical Evaluation of Combat Operations Report (henceforth known as CHECO) program features a number of CHECO battle accounts with Army praise of the fast jets' support; for example, see Warren Trest and CAPT James Bruce, USAF, "Operation El Paso" (Hickam AFB, Hawaii: Headquaters [HQ], Pacific Air Forces [PACAF], 30 November 1966); and CAPT Melvin

Dennis Drew, USAF, "Rolling Thunder: Anatomy of a Failure," CADRE Paper, Report #AU-ARI-CP 86-3 (MAFB: Airpower Research Institute, 1986; reprint MAFB: Air War College Associate Programs Course-MS 610AP, Lessons 8-13, 1993), 84-98 (page reference is to reprint); Futrell, Ideas, vol. II, 288-294; COL A.L. Gropman, USAF (ret.), "The Air War in Vietnam, 1961-1973," in War in the Third Dimension: Essays in Contemporary Air Power, ed. AVM R.A. Mason, RAF (London: Brassey's, 1986), 70-76; Hosmer, "Psychological Effects," 129-139; Eduard Mark, Aerial Interdiction: Air Power and the Land Battle in Three Wars (Washington, D.C.: Center for Air Force History, 1994), 324-326, and 406-409 (also mentions that the Air Force lacked suitable fighter-bombers even for its favored interdiction work); Mrozek, 17-20 (Air Force's narrow war view created problems); Neufeld, Sprey, 28 (discusses irony of MiG-17 victories over faster American jets); Sheehan, A Bright Shining Lie, 676-679 (explains how the mathematics of too few airplanes attacking too many targets spelled the interdiction campaign's failure); Spick, The Ace Factor, 144-151 (recounts the problems encountered by fighters in the North); Tilford, "Rolling Thunder and the Diffusion of Heat," chap. in Setup, 89-163; and Worden, "Absolutists and the Frustration of Airpower in Vietnam (1964-69)," chap. in his Rise of the Fighter Generals, 157-183.

had their problems. With their great speed, they could respond to an air task quickly enough, but the same problems seen in Korea surfaced in Vietnam, especially given the region's tropical climate. Their ability to maneuver closely and slowly enough to see the target, to work safely when the weather was poor, to carry sufficient ordnance, and to remain over the battle area, were all limited.<sup>28</sup> Colonel Jack Broughton, a legendary F-105 pilot, summed up the handicaps when he described a four-plane formation of F-105s flying a road reconnaissance ("road recce") mission in bad weather with a heavy load of bombs and missiles:

Sitting there with a heavy load like that, trying to road recce, and looking for a native village was a disaster. The machines were just not built for it .... They had no maneuverability and the fuel on all four airplanes was going like crazy as they snaked down the road, giving it the old college try to find that village .... Dave [one of the pilots] was hurting. He was running out of fuel and he couldn't get high enough to put the bombs anyplace worthwhile, even if he had found someplace worthwhile.<sup>29</sup>

<sup>28</sup>Jet problems are from Barnes, 63-65 (Vietnam presented weather difficulties that hurt fast jet CAS; and in spite of the generals' beliefs, the war witnessed specialization of airplanes for missions); Gunston, 249-250, 256-257 (good explanation of difficulties); Momyer, 271(inadvertently reveals one disadvantage when praising the jets' arrival--long paved runways built to handle their heavy weight and lengthy takeoff and landing rolls); Craig Powell, "The A-10," <u>Army</u> (March 1976): 45; Sbrega, 444 (in spite of praising the jets' effort, concedes their difficulties with high speeds and lack of sufficient fuel); Spick, 146 (F-4's lack of maneuverability even for dogfighting); and Tilford, 113 (details performance penalties as they pertained to Vietnam).

<sup>29</sup>Broughton, <u>Going Downtown</u>, 67.

Porter, USAF, "The Siege at Plei Me" (Hickam AFB, Hawaii: HQ PACAF, 24 February 1966).

Concerning the CHECO Program, however, Bergerson, 120; and Futrell, <u>Ideas</u>, <u>Vol. II</u>, 316-323, question its charter and results. Bergerson implies that one of its purposes was to compare Air Force and Army aviation performance, apparently to provide documentary ammunition for possible interservice fights back home. Futrell commends its attempt to provide contemporary historical documentation of the service's Vietnam War performance, but he believes that its Air Force-centered attitude led it to overlook what effect the air campaign had upon the enemy.

Broughton's observations were not unique. The supersonic jet pilots had other missions to think about. Their high speed and/or high altitude weapons deliveries gave them little opportunity to fully understand what was happening down below and sometimes gave them the feeling that air support missions were useless. One observed that CAS results were good if one could find the target, and added "What's the target? A piece of jungle out here... you don't know what you're hitting; [you're] making toothpicks."<sup>30</sup>

Given these problems, even officers and later observers who favored the supersonic jets conceded that the propeller-driven A-1 (for photo, see Appendix Fig.28) was the CAS star. Major Richard Griffin was a forward air controller (FAC) who flew a spotter plane in Vietnam during the mid 1960s. He acknowledged the greater abundance of fast jets, particularly the F-100, but he still preferred the A-1:

I think that anybody in Vietnam that flew as a FAC probably has somewhat the same thought. If it wasn't the best, it was probably the most versatile . . . . Number one is that the A-1 would carry an awful lot of crap . . . it had all kinds of bombs and everything hanging on it . . . . Another thing . . . that you always ask for early when you've got fighters on to the target, say: "Well . . . how long can you stay here?" And invariably the guys in the A-1's would always come up with something smart . . . "about an hour longer than you can." Well, you know, most of the time in the F-100's or F-4's . . . they talked in minutes.<sup>31</sup>

Major Griffin also submitted the common sense observation about jet versus A-1 attack speeds that "If you're coming out on a target at 450 knots you, obviously, have to release higher than you do if you're coming in at 250." When he directed a jet pilot's eyes unto a target, he "had to talk in terms of rivers and mountains." But with A-1 pilots,

<sup>&</sup>lt;sup>30</sup>Strain on multi-purpose pilots is from Neufeld, <u>Sprey</u>, 27; and Tilford, 217. Dick, <u>Disosway</u>, 192, recalls a staff research visit in 1962: "Of course, you couldn't see anything in the damn jungles out there." Quote is from <u>Talbott</u>, 137. Talbott was an F-4 wing commander in 1966. The wing also flew fighter escort missions in North Vietnam.

<sup>&</sup>lt;sup>31</sup>Hugh Ahmann and LTCOL Vaughn Gallagher, USAF, <u>Interview of Major</u> <u>Richard L. Griffin</u> (MAFB: USAF Oral History Program, 24 March 1972), 62-63, transcript, AFHRC Holding K239.0512-542. LTGEN Talbott liked his F-4's CAS performance, but conceded the A-1 was superb because of its load carriage, maneuverability, and loiter time; see <u>Talbott</u>, 144.

"Instead of having to talk in large geographic features, you can talk in very much detail . . . [so] he can come right in."<sup>32</sup>

Colonel Eugene Deatrick, who served in Vietnam as an A-1 squadron commander, made similar comments in later interviews while pointing out further implications of the A-1's performance and mission. Since his was a dedicated air support outfit, Deatrick insisted that men from Army units and his pilots conduct exchange visits, and he often took the soldiers on flights over their own camps. This yielded very positive results, as soldiers and pilots fine-tuned procedures involving communications, optimum weapons, visual signalling, and unit escape routes from an overrun camp. Deatrick later described the soldiers' reaction to their orientation flight as "those air force people aren't as blind as we think they are. They've got some problems and what we've got to do is find a better way to identify ourselves from the ground." For their part, the pilots gained increased empathy for the soldiers that they supported. Deatrick observed that this was not the case with the F-100 units in Vietnam at the time. They not only did not have Army-compatible radios like the A-1, but their units did not pursue exchange visits as assiduously as Deatrick's outfit. "I doubt if they had ever seen each other," he guipped. That and the jets' higher altitudes for setting up their weapons deliveries and higher speeds made it such that a jet pilot was often "sitting up there completely in the dark just circling. All he could see was the FAC [in a spotter plane] flying around. Had no idea of what was going on. He might see some ... smoke go up ... and still had no idea what it meant."33

<sup>32</sup>Ahmann and Gallagher, Griffin, 64.

<sup>&</sup>lt;sup>33</sup>COL Ray Bowers, USAF, and MAJ Ralph Rowley, USAF, Interview with Col Eugene Deatrick (USAF), C.O. 1st Air Commando Sqdn, Pleiku, SVN, Feb 66-Feb 67, and Col. Eleazar Parmly (USA). Spec. Forces Advisor to Laos. May 60-May 61, USSF Det C.O. I and III Corps, Aug 66-Jul 67, (Washington, D.C.: USAF Oral History, 9 March 1972), 55-62, transcript, AFHRC Holding K239.0512-705 (first quote, 58, second quote, 62, and third quote, 51-52). Parmly confirmed the advantages Deatrick mentioned (48-50). Years later, Deatrick re-emphasized the importance of interaction between air support units and the ground units, the fast jets' CAS deficiencies, and TAC's low regard for the CAS mission in the war's early days; interview by author, Alexandria, Va., 8 May 1997, author's notes. It is understood that Deatrick's tour occurred in 1966, but his assessment is included here as an example of the A-1's--and A-1 units'- special CAS

The A-1 also scored on accuracy and its ability to handle Vietnam's often cloudy weather conditions. Whether delivering ordnance from steep dives (the more accurate delivery) or from level-flight, its low speed and maneuverability allowed the pilot to execute his attack relatively close to the ground, which further improved accuracy. The plane routinely delivered weapons within fifty meters of hard-pressed friendly forces per their desperate request. One type of air support was combat search-and-rescue (SAR) of downed pilots, a mission in which the A-1 excelled as an armed escort for rescue helicopters. An A-1 pilot who supervised SAR operations, Major James Costin, stated that one reason for choosing the A-1 over fast jet fighters was its accuracy hitting potential captors pursuing the downed aviator. "On at least two occasions," he said of the jets, "I saw them drop on the survivor .... They're too high ... and they just weren't that accurate." A-1s earned respect for working targets in marginal weather unsuited to jets, and both Army units and helicopter pilots praised the plane for sticking around in fair weather or foul to provide life-saving heavy fire support. Colonel Deatrick's men made sure this happened by devising procedures for working beneath the weather to support each camp. The A-1's success in poor weather raises the question of its night capability. Though it did not have the radar or infrared equipment carried by so-called night/all-weather planes, it flew many night missions. The pilots improvised tactics to prevent mid-air collisions, identify the target via flares, and above all, not get shot down. Interestingly, A-10 pilots would use many of the same tactics in Desert Storm.<sup>34</sup>

proficiency. GAO, <u>Close Air Support: Principal Issues and Aircraft Choices</u>, 63, also points out the difficulty of seeing troops in the jungle terrain.

<sup>&</sup>lt;sup>34</sup>LTCOL Vaughn Gallagher, USAF, and MAJ Lyn Officer, USAF, <u>Interview</u> <u>#653 of Major James Costin</u>, (Eglin AFB, Fla.: USAF Oral History Program, 6 February 1973), 10-12 (SAR quote p. 10), 24-25 (marginal weather procedures), transcript, AFHRC Holding K239.0512-653.

Concerning, the A-1's ability to deliver weapons near troops in contact, LTGEN Moore and Galloway again provide another good CAS example in <u>We Were Soldiers</u> <u>Once</u>. They cite the Army's appreciation for the A-1 and its accuracy (and loiter time) in the October 1965 Ia Drang battle: "Overhead, some of the best air-support work was being done by the A-1E Skyraider . . . . it delivered very accurate fire and, best of all, could hang around for up to eight hours" (p. 96). Praise for the plane is scattered

A final characteristic that impressed people about the A-1 was its ability to survive in a hostile environment. Survivability involves two characteristics: ability to avoid being hit and ability to survive hits. Critics and some A-1 pilots pointed out that the plane was too slow to evade antiaircraft fire, especially the new SAMs that North Vietnam obtained from Russia. Even so, A-1s flew into certain parts of North Vietnam until the 1970s, and Navy A-1s even scored two kills against MiG-17 jet fighters in 1965 (defensive fights against cocky or inept MiG pilots). The plane's most important combat survival attribute was its ruggedness, because A-1s took many antiaircraft artillery (AAA) hits in their low and slow attacks. A-1 pilot Costin said it was "the type of aircraft which could take a good

elsewhere in the book; see pp. 96-97, 227, 303-307. On pages 189-190, F-100s are called off after they accidently roll in on American soldiers. In his Air Force Oral History interview, MAJ Griffin said that the A-1's accuracy was another reason FACs and the Army preferred it; Gallagher and Ahmann, <u>Griffin</u>, 64-65. Helicopter pilots praised the A-1's support in the landing zones; see Cecil Brownlow, "Burgeoning U.S. Use of Air Power," <u>AW&ST</u>, 29-30 (Brownlow reflected the Air Force view, however, in that he kept mentioning that the A-1 would not survive if the Red Chinese Air Force got involved in the war[?]).

Costin was not the only A-1 pilot happy with his plane. A-1 pilots themselves fairly boasted of their plane's weapons delivery and marginal weather capabilities; see Bowers and Rowley, <u>Deatrick</u>, 49-50 (accuracy), 56 (weather descent procedures); COL Deatrick, interview by author; and LTCOL Lyn Officer, USAF, <u>Interview of Major Upton D.</u> <u>Officer</u>, (MAFB: USAF Oral History Program, 11-13 July 1973), 26-28, 31-32, transcript, AFHRC Holding K239.0512-680.

CAPT Melvin Porter, USAF, "Second Defense of Lima Site 36," Project CHECO Report (Hickam AFB, Hawaii: HQ PACAF, 28 April 1967), iv, 5, 6, praises the A-1s for preventing a massacre when jets could not operate for weather (the action occurred in 1966, but is included here to demonstrate the A-1's abilities). MGEN James Hildreth also served as an A-1 squadron commander, and recounts an incident where headquarters refused his request to help a surrounded Army patrol, and instead sent F-100s. The jets could not get under the weather and the patrol was lost; see Hasdorff, <u>Hildreth</u>, 31. Schlight, 99-100, provides an example of A-1 night CAS operations that occurred during 1965. Night tactics are from Gallagher and Officer, <u>Costin</u>, 31-40.

Besides Costin, other comments on the A-1's SAR role are in MAJ Russell Bennett, USAF, "Can the A-X Adequately Replace the A-1 in the COIN and SAR Role?" (Research study, USAF Air Command and Staff College [henceforth cited as ACSC), 1973), 14; and Earl Tilford, <u>Search and Rescue in Southeast Asia</u>, USAF in Southeast Asia Series, (Washington, D.C.: Office of Air Force History, 1980; reprint, Washington, D.C.: Center for Air Force History, 1992), 66 (page reference to reprint).

hard hit and a lot of them and not get hurt too bad." Colonel Deatrick recalled returning to base with his engine shot up and one landing gear shot away. His unit lost only one plane to ground fire, and even that one managed to belly land back at base. Another squadron commander later asserted that jet aircraft could not take the punishment he saw A-1s endure, which included a man-sized hole in one plane's wing and another so badly shot it looked like a "sieve." Indeed, the available A-1 pilot oral histories reveal that losses often came when pilots became too aggressive or used bad tactics.<sup>35</sup>

The previous discussion about weather capability and survivability is important considering the A-1's--and later, the A-10's--Air Force dedicated CAS counterpart, the gunship. The modification of transports such as the C-47 and C-130 (for photos, see · Appendix Figs. 29 and 30) into bristling gun platforms was another Vietnam-related story of how tactical common sense prevailed in a doctrine-slaved Air Force. These lumbering planes had much better loiter capability than even the A-1, and their firepower, which included Gatling guns, cannon, and lots of ammunition, was truly striking. They thus made many impressive saves of beleaguered Army units. But they were slower, much less maneuverable, and less rugged than the A-1, and any sort of antiaircraft opposition restricted their operation. In spite of one observer's praise of their all-weather capability and quick air-request response times, the actual evidence tends toward another conclusion. Their night-vision gear could not see through clouds, and their weapons delivery pattern altitudes and lack of maneuverability precluded any work beneath low clouds. The quick

<sup>&</sup>lt;sup>35</sup>Outside critic of A-1's speed is Sbrega, 441; and Air Force critics are Momyer, <u>Airpower in Three Wars</u>, 263, 270; and MAJ Costin interview by Gallagher and Officer, 33 (A-1 pilot). Account of A-1 success against MiGs is in Dorr, 57-60. Information on A-1 flights into Laos and north of the DMZ is also from Dorr, "Loitering with Intent," and "Secret War in Laos," chaps. in his <u>Skyraider</u>, 93-128; and Gallagher and Officer, <u>Costin</u>, 14. A number of sources speak of the A-1's ability to sustain damage and fly; they are Dorr, 60; Gallagher and Officer, <u>Costin</u>, 6 (quote), 13, 27-29 (observations about bad tactics and losses); Gunston, 250-251; Officer, <u>Officer</u>, 68-69 (makes the same point as Costin). The "other squadron commander" is MGEN Hildreth, in Hasdorff, <u>Hildreth</u>, 68-78. Hildreth pointed out that the plane was not invincible, and many losses occurred due to over-aggressiveness and carelessness. Air Force LTGEN Marvin McNickle was no fan of the A-10, but remembered the A-1's ruggedness and load carrying capacity with affection; see Ahmann, <u>McNickle</u>, 114.

response-time claim is curious, for in spite of being slower than the A-1, they escaped the same observer's censure of the A-1 for being too slow to respond to air requests. The Air Force mostly used gunships in a logistic interdiction capacity in Laos. They flew night missions in the dry season in areas prepared by other planes--the A-1 being one of them. These criticisms are not to say that the gunships were unnecessary. Like the A-1, and later the A-10, they had their place in the American airpower and foreign policy spectrum.<sup>36</sup>

## The Pike Committee Examines Vietnam CAS, Autumn 1965

The A-1's performance was one part of the Air Force CAS effort getting attention in the U.S. Congress in mid 1965. The teething process as the services worked out CAS procedures in Vietnam was still underway, and legislators heard plenty of complaints. But most of the blame lay with the Air Force and its failure to meet agreed-upon commitments,

<sup>&</sup>lt;sup>36</sup>The best source for the gunships' struggle for existence and respect is Jack Ballard, Development and Employment of Fixed-Wing Gunships (Washington, D.C.: Office of Air Force History, 1982). The favorable gunship CAS source is Sbrega; see pp. 444-445 (p. 441 has his criticism of slow A-1 response). Other sources for gunship design and action are: Dorr, 110-111 (A-1 support required for gunship interdiction); Futrell, Ideas, vol. II, 306-307 (aircraft support for gunship interdiction); Gallagher and Officer, Costin, 14 (A-1 support missions); Mark, 335-338 (gunship interdiction action); LTCOL Thomas McGrath, USAF (ret.), personal interview by author, 7 November 1997, Holloman AFB, N.Mex., notes in author's possession (former Laos airborne FAC points out AC-130 poor weather limitations with its infrared sensors, as well as need for armed escorts to suppress anti-aircraft fire); Mrozek, 125-132 (cites irony of lumbering planes flying interdiction, as well as capabilities); Schlight, 199 (example of gunship problems with weather), 238-240; Tilford, 175-177 (interdiction, survivability problems, and required aircraft support). AC-130 crew member LTCOL Henry Zeybel, USAF (ret.) describes the gunships' strengths and weaknesses in his Laotian interdiction campaign narrative, "Truck Count," Air University Review 34 (January February, 1983): 36-45.

Even B-52s performed air support in Vietnam. Their huge bomb loads guaranteed maximum shock effect and especially helped during the siege of Khe Sanh. However, the same problem that heavy bombers encountered during World War II often hindered the B-52s' effectiveness in Vietnam. They required much more mission preparation time, and their high altitude, mass bomb deliveries were more suited to area targets free of friendly troops. See Hallion, "A Retrospective Assessment," 13-14; Mrozek, 139-145; and Sbrega, 445-446, 456-458; and Jeffrey West, "On the Decisive Role of Air Power in the Outcome of Two Indochina Battles: Dien Bien Phu-1954, and Khe Sanh--1968," in Proceedings. Symposium: Air Support, 307-341.

and some congressmen agreed. Starting a trend whereby ex-Marine congressmen and staffers willingly served as CAS advocates versus the Air Force, Daniel Flood (D-PA) was a conduit for Army complaints about Air Force Vietnam CAS snafus. Congressman Otis Pike (D-NY), who flew Marine dive bomber CAS in World War II and who wanted more focus upon unconventional warfare, later said that he also received discreet complaints from lower ranking Army officers about Air Force failings (the senior leadership apparently did not want another interservice fight and told him everything was fine). He gladly chaired a subcommittee convened for seven days in early autumn 1965 by House Armed Services Committee Chairman Mendel Rivers (D-SC) to investigate Vietnam CAS deficiencies.<sup>37</sup>

The committee members focused upon slow air task response times and incompatible radios, and also made unfavorable comparisons to the Marines' CAS style. But they spent most of the hearings criticizing the Air Force's failure to produce an airplane dedicated to meeting its agreed-upon commitment to the Army. They asked all of the witnesses, which consisted of Vietnam veterans and senior officers of various services, their opinions about suitable CAS planes. The three Army Vietnam veterans who appeared were primarily concerned that Air Force planes show up when needed, though all regarded the A-1 as one of the best, if not the best, CAS planes. They also liked all of the fixed-wing planes' capacity to deliver heavy firepower. The junior-ranking Air Force pilots tried to avoid directly answering the congressmen's pointed questions--perhaps because they felt the gaze of their superiors. The first, A-1 pilot Captain Alan Rennick, gave

<sup>&</sup>lt;sup>37</sup>MGEN Hildreth noted that Army commanders relayed their enthusiasm for the A-1 to visiting government functionaries; Hasdorff, <u>Hildreth</u>, 32. For Flood's role and the Army's complaints to congressmen, see Bergerson, 116. Pike's background, his assessment of Army dissatisfaction, and his position on warfare are from Buhrow, "Close Air Support Requirements," 1-2, 39; Congress, House, <u>Close Air Support</u>, 22 September 1965, 4639-4641; Goldberg and Smith, 27; and author's telephonic interview of Otis Pike, 10 March 1997, author's notes. Mendel Rivers' concerns are from Congress, House, Report of Special Subcommittee on Tactical Air Support of the Committee on Armed Services, <u>Close Air Support</u>, 89th Cong., 1st sess., 1 February 1966, 4859.

conditional answers that were actually quite sensible. He praised the A-1's accuracy, ruggedness, loiter time, and short runway capability. But when pressed to compare the A-1 and F-100, he wanted the F-100's speed to evade defenses when needed. He also believed that the two planes complemented each other. Under Pike's badgering, F-100 pilot Captain David Sands, still preferred speed and multi-role capability, while another F-100 pilot, Lieutenant Colonel Emmett Hays, admitted that the F-100 was not primarily a CAS plane and lacked Army-compatible radios. Before the committee brought in the higher ranking officers, it questioned Marines about their well-developed procedures to provide comparison to the Air Force and Army.<sup>38</sup>

Pike revealed the Air Force's deficiencies better when he and his colleagues interviewed the generals. The former Director of Army Aviation and aviation activist, Major General Delk Oden, perhaps felt his own service's pressure not to upset interservice relations as he resisted the committee's leading questions about CAS. "It's a great morale booster, if nothing else," insisted Subcommittee Chief Counsel John Blandford as he pressed the general. Oden said he agreed with the Air Force's mission priorities as they pertained to aircraft selection until Pike asked him bluntly if he knew of any Air Force planes that were really designed to do CAS-to which he had to reply that he did not.<sup>39</sup>

<sup>&</sup>lt;sup>38</sup>Army Vietnam veteran witness preferences are from Congress, House Hearing, <u>Close Air Support</u>, 4653, 4663, and 4674. Pertinent Hearing testimony from CAPT Rennick, CAPT Sands, and LTCOL Hays is on 4688-4689, 4691, 4693-4698, 4710, 4715, 4722, and 4729. (On p. 4691, Rennick questions the committee's apparent preference for STOL aircraft that operate on rough strips near the troops by asking how these planes will be resupplied. On p. 4722, Hays retorts that the Army should prepare its requests better in order to get quicker response.) Marine testimony is on 4732-4752. (The Marines said their jets' accuracy was okay, and Pike--apparently feeling that this was due to their superior system--left it at that; see p. 4748).

<sup>&</sup>lt;sup>39</sup>Pertinent parts of Oden's testimony are in House Hearings, <u>Close Air Support</u>, 4765, 4771 (Blandford quote), 4778, 4779-4780 (Pike asks blunt questions). Another possible reason why Oden was willing to accept Air Force CAS decisions was that, as will be seen, the Army had pressed forward with its attack helicopter plans. Being an Army aviation advocate, perhaps he wanted the attack helicopter to do CAS and let the Air Force handle the air superiority and interdiction missions.

With that, Pike dismissed Oden and turned his attention to the Air Force Assistant Chief of Staff for Plans and Operations, Major General Arthur Agan.

One Air Force general later described Arthur Agan as *the* fighter pilot in the Air Force Plans Directorate at that time, and as such, he represented the Air Force philosophy that Pike wanted to challenge. As with Major General Oden, Pike forced the general to admit that the F-100 and F-105 were not designed for CAS—and that the A-1s in the service inventory were originally Navy planes. Pike finally asked, "Can you give me any aircraft that the Air Force has developed since World War II for which the primary mission was close air support?" Agan replied, "Not that way; no, sir." Agan and Pike agreed that the nation's 1950s New Look strategy drove the current jet conventional war design deficiencies, but Agan had no answer to Pike's question about what the Air Force currently planned for CAS. As his time before the subcommittee ended, Agan insisted that procuring a dedicated CAS plane would be fine as long as it possessed the capability to defeat enemy fighters.<sup>40</sup>

The last two Air Force generals appeared together; they were the Systems Command chief, General Bernard Schriever, and the Deputy Chief of Staff for Research and Development, Lieutenant General James Ferguson. Schriever answered most of the questions and tried somewhat to defend and explain the Air Force position. He produced a letter from a grateful Vietnam ground commander for air support at the Battle of An Khe, and he admitted that the service's historical development and budget concerns led it to desire air combat capability for its tactical planes. He himself preferred the F-5 for conflicts like Vietnam. But Congressman Charles Gubser (R-CA) attacked Schriever's budget excuse (Agan had used it as well) by asking him if "the lessons we have learned in Vietnam have pointed up the fact that you cannot apply the cost-effectiveness technique in a situation like Vietnam, where the possibilities are so infinite?" Pike skewered Schriever's F-5 CAS plane choice by forcing him to admit that it was not primarily a CAS plane. But

<sup>&</sup>lt;sup>40</sup>Hasdorf, <u>Hildreth</u>, 62, features the opinion of Major General Agan. (Hildreth was on the Air Force Pentagon staff at the time.) For Pike's hard questioning and Agan's response, see House Hearing, <u>Close Air Support</u>, 4789-4790. Agan's parting preference for fighter-type planes is on pp. 4796-4797.

Schriever was unlike the other Air Force men in that he at least opined that the Air Force had ignored an entire combat spectrum. He claimed that he "would have started a development for a close air support plane, for the nature of warfare that we have been encountering since the end of World War II, sooner." This comment revealed an attitude change affecting some Air Force leaders.<sup>41</sup>

## Aircraft Choices, and the A-7 Choice, 1963-1965

Air Force leader attitudes changed because pressures beset the service from many directions. In mid 1964, as the Vietnam War escalated and the A-1 started earning favorable attention, McNamara and OSD studied re-opening A-1 production. They decided not do this because, in an example of aircraft cost inflation and McNamara's mindset, he felt that the five-fold increase over its original price eliminated its cost effectiveness. For his part, Air Force Secretary Zuckert had his service explore limited war aircraft options through the end of the year. In a memorandum response to one of

<sup>&</sup>lt;sup>41</sup>Pertinent Schriever testimony is from House Hearings, <u>Close Air Support</u>, 4836-4839 (Schriever produced the Army letter and an unsigned staff study for the record which discussed Air Force tactical plane selection and its CAS predicament in Vietnam), 4844-4846 (discussion of F-5), 4850-4851 (Schriever's own observations about traditional Air Force tactical plane selections, and quote of his opinion), and 4852 (Gubser quote).

Schriever revealed his more common sense approach to the CAS plane question in later discussions. In a personal interview by the author (1 May 1997, Washington, D.C., notes in author's possession), he spoke of his 1963 clash with LeMay over the attack plane issue because he believed that such a plane was possible given the Air Force's air superiority. In an earlier interview for the Air Force, he sharply rebuked the Air Force interviewers' dogmatic contempt for gunships in the following exchange. Interviewer: "Do you feel that the gunship violated Air Force doctrine by putting guns on transport aircraft and using it in that fashion?" Schriever: "Air Force doctrine. I don't know what the hell you're talking about. What I want is a weapon system that can do the job at hand in the most effective way." Interviewer: "You need air superiority to maintain a gunship program though, and we were awful shortsighted in that area." Schriever: "Sure we need air superiority .... we have had ... air superiority ... since World War Two .... No, I think that the gunship is one of the great inventions of the Vietnam War." See James Hasdorff and MAJ Lyn Officer, USAF, General Bernard A. Schriever, (Washington, D.C.: USAF Oral History Program, 20 June 1973), 71-72, transcript, AFHRC, Holding K239.0512-1566

Zuckert's letters requesting money for the study, McNamara told the Air Force Secretary that the service needed to accept that it would encounter limited wars where air superiority would not be an issue. As such, he wanted it to reexamine purchasing such planes as the A-7 or F-5, and he raised this effort's budget to demonstrate his seriousness.<sup>42</sup>

McNamara's early-1965 memorandum actually reinforced the ongoing efforts of his Whiz Kids. The previous June, the Director of Defense Research and Engineering (DDR&E), Harold Brown, pointed out to McNamara that although the two services could not agree on the ideal CAS plane, a mixed force structure of low and high cost planes might satisfy both the Air Force's and the Army's needs. He noted that using only expensive planes like the F-111 would satisfy neither these nor overall force needs. Other OSD staff had also pressed the Air Force to examine the Navy's A-7, then under development. LeMay's response to this OSD effort was public and blunt: "I am very unenthusiastic about the A-7... it is not much good." Meanwhile, his Research and

<sup>&</sup>lt;sup>42</sup>Bright, Jet Makers, 21 and 149 (the A-1 originally cost approximately \$150,000 each, but to build one in 1965 would cost approximately \$800,000); Robert McNamara, Secretary of Defense, "Close Support and SAW Aircraft," Memorandum for the Secretary of the Air Force, 7 January 1965, Supporting Documents ("SAW" means "special air warfare," such as the Farm Gate/Jungle Jim operations); and Mischler, <u>A-X</u>, 6-8; and MAJ Pat "Doc" Pentland, USAF, "Evolution of A-10 Mission Requirements," Headquarters (HQ) Air Force Staff (Fighter Plans) Research Paper, 10 June 1988, from Air Force History Office via 2/LT Matthew Rodman, USAF, copy in author's possession (Pentland called Zuckert's study the Air Force Light Ground Attack Aircraft [LGA] Study).

A sidelight OSD activity during the 1963-1965 period was the choice of one service to oversee the Counter-Insurgency/Light Armed Aircraft (COIN/LARA) program. OSD wanted to buy an armed light propeller plane with STOL capability to support jungle antiguerrilla operations. It dismissed the Air Force for obvious bias against even nonsupersonic jets. However, given the A-1's Vietnam success, Air Force leaders wanted that rugged well-armed plane for such missions—they were less impressed with the combat performance of the less durable and less lethal T-28 armed trainer that they considered a COIN/LARA equivalent. OSD rejected the Army due to the roles-and-missions fight already underway. Finally, OSD assigned development to the Marine Corps, which bought the North American OV-10 Bronco. The OV-10 was a light twin turboprop plane that the Air Force purchased only for airborne FAC duties. See Futrell, <u>Ideas</u>, vol. II, 207-208; Mischler, 6; and Sweetman, <u>Modern Fighting Aircraft: A-10</u>, 4-5.

Development Deputy, Lieutenant General Ferguson, supplied the usual explanation that the A-7 had no air-to-air capability.<sup>43</sup>

But the McNamara OSD staff believed, in the words of one of the most prominent Whiz Kids, Alain Enthoven, "that for the kind of wars the tactical air forces were likely to fight . . . the A-7 would simply be substantially better." As such, LeMay's resistance did not deter OSD staffers from ordering the Air Force in the summer of 1964 to study Brown's proposal. Formally titled, "Force Options for Tactical Air," and more popularly known by the last name of its project officer, Lieutenant Colonel John Bohn, the study generally agreed with Brown's overall force-mix but offered another air-to-air fighter, the F-5, as the low-cost end of the force-mix spectrum. (Its release in early 1965 made it a ready response to McNamara's memorandum of that time.)<sup>44</sup>

The Bohn Study revealed the Air Force's prowess at using systems analysis for its own ends. The study board took OSD's simplistic analysis model that compared several tactical aircraft by total payload carried for total miles against nonexistent ground defenses; and then added another model which included heavy air defenses. The board members failed OSD's favored A-7, which had exceptional payload and range abilities but was no fighter, and favored the F-5, which was supersonic and a reasonably good air-to-air machine. The Air Force Pentagon staff briefed the results to Brown and another OSD staff member in March, 1965. Brown was happy that the service accepted the force-mix concept but bluntly told the briefers that action would be required soon--and that the A-7

<sup>&</sup>lt;sup>43</sup>Head, 230-231, for Brown's actions. MAJ Head believes Brown's memorandum was significant because Brown would soon be Secretary of the Air Force. LeMay and Ferguson details are from Futrell, <u>Ideas</u>, vol. II, 470.

<sup>&</sup>lt;sup>44</sup>Enthoven quote is from his 8 April 1970 interview with MAJ Head, cited in Head, 246. Bohn Study setup is from Head, 243-246, and Jacob Neufeld, "The F-15 Eagle: Origins and Development, 1964-1972," (Washington, D.C.: Office of Air Force History, 1974), 9-10. Secretary Zuckert intimated to McNamara that the Air Force wanted a CAS plane too, but the plane had to survive in all theaters (read Europe); see Eugene Zuckert, Secretary of the Air Force, "Close Support and SAW Aircraft," Memorandum for the Secretary of Defense, 2 February 1965, Supporting Documents.

and F-5 would be the candidates (he regarded the Air Force's other favored option--a stripped-down F-4--as too much modification effort and cost for the return).<sup>45</sup>

The Air Force Tactical Air Command (TAC) was the command that would have to integrate the A-7 into the force structure if the service procured it. Thus, OSD staffers realized that TAC support was crucial to service acceptance of the plane, but TAC rejected it. Indeed, TAC headquaters officers introduced the air defense methodology to the Bohn Study. In December 1964, OSD sent one of its A-7 proponents, Vic Heyman, to determine the depth and nature of TAC resistance.<sup>46</sup> "I laughed at him," recalled the former TAC Deputy Commander for Operations, Major General Gordon Graham, of Heyman's personal visit. Heyman later said, "They really considered the A-7 a dog." He could not understand the attitude, but fellow staffer Alain Enthoven rated it as symptomatic of the Air Force's world view, which involved "doing their own thing like winning the air battle while somebody else was winning the ground battle."<sup>47</sup>

Enthoven's opinion leaned toward organizational dynamics, which given the service history presented so far, has some validity. However, the fighter men felt that historical common sense combined with force structure considerations to support their position. General Agan remembered telling Enthoven about the large number of fighters required to escort bombers in World War II, and then reminding the OSD staffer that such an escort force size would not be available to protect A-7s in the projected desperate fight with Soviet interceptors in Europe. But to Agan, Enthoven's reaction seemed oriented toward

<sup>&</sup>lt;sup>45</sup>Results are from Jack Neufeld, <u>Interview of Maj Gen John J. Burns</u>, (Washington, D.C.: USAF Oral History Program, 22 March 1973), 20-25, transcript, AFHRC Holding K239.0512-961 (Burns participated in the study, and recounted the methodology change); Head, 247; and Air Force GEN John McConnell, Chief of Staff, Air Force (CSAF), "Hq USAF Study on Force Options for Tactical Air," letter to Secretary of the Air Force, 15 March 1965, Supporting Documents.

<sup>&</sup>lt;sup>46</sup> Head, 251-253.

<sup>&</sup>lt;sup>47</sup>Graham quote is from interview with MAJ Head, 11 February 1970, and Enthoven quote is from interview with same source, 8 April 1970; both cited in Ibid., 251, and 253.

cost effectiveness instead of any valid tactical reason. "The 'crime of the time' was that we had to talk to a guy like that," Agan snorted.<sup>48</sup>

To the fighter generals, the issue summoned memories of life-and-death aerial struggles in World War II, and what struck them most about that conflict was the penalty for technological inferiority. To the incoming TAC commander, General Gabriel Disosway, dedicated ground attack planes like the German Stuka were meat for Allied fighter predators, and he did not want to waste force structure assets repeating the Germans' mistake. He correctly remembered that the Stuka encountered problems flying unescorted interdiction missions in the Battle of Britain, but he forgot that it flew Eastern Front air support missions until the end of the war because Soviet fighters rarely ventured into the hostile battlefield environment.<sup>49</sup> But no matter, TAC staff members bitterly opposed buying an attack plane with the attendant risk that "someone's going to send it up to shoot MiGs and they're going to get themselves killed," as one put it. One TAC general even told the fighter pilot assigned to research the A-7 issue at Air Force Pentagon headquarters, "Major, you'd better remember, you're going to want to come back to TAC one of these days. You had better remember that when you're working this thing." But the opposition did not deter Heyman. Apparently believing that systems analysis could overcome all biases, and perhaps emboldened by McNamara's recent memorandum, he tasked TAC in April 1965 to conduct a cost effectiveness study of CAS plane candidates.

<sup>&</sup>lt;sup>48</sup>Neufeld, <u>Agan</u>, 18-20 (quote on p. 20). Hildreth also was disturbed by the Whiz Kids' simple-minded infatuation with economic efficiency. But he agreed that, for CAS, a cheap rugged plane was better for the high threat battle arena than an expensive plane; see Hasdorff, <u>Hildreth</u>, 30, 59.

<sup>&</sup>lt;sup>49</sup>Futrell, <u>Ideas</u>, vol. II, 174, 492; and Head, 253 and 284 (his 3 April 1970 interview with GEN Disosway). Both authors mention that the fighter leaders fixated upon the Stuka as an historical example of the folly of dedicated attack planes. Even in his 1984 Air Force Oral History Interview, LTGEN Sweat likened the A-10 to the Stuka--after calling the A-10 a "stupid plane to buy"; <u>Sweat</u>, 119. MGEN Hildreth observed that GEN William Momyer fought the A-7 buy from afar, but no less intensely than his colleagues. (He commanded Air Force Training Command and then was Seventh Air Force commander in Vietnam.) Momyer stuck to his World War II-bred principle that tactical planes had to be able to defeat enemy fighters. See Neufeld, <u>Hildreth</u>, 29, 60-61.

Equally undaunted, TAC published the resulting report, entitled "Cost Effectiveness in Close Air Support," in May 1965, and condemned the A-7 while praising the F-4.<sup>50</sup>

But 1965 was a time when such obstinate resistance faced more than persistent OSD bureaucrats, as the Vietnam War provided two sources of pressure. It created an arena to showcase the A-1's talents while revealing the deficiencies of the Air Force's fast tactical jet dogma. And the Army now more urgently acted upon Vance's 1963 attack helicopter call in order to provide protection for its helicopters. Throughout late 1964 and into 1965, that service requested and reviewed contracts for development of an Advanced Aerial Fire Support System (AAFSS), or AH-56 Cheyenne (for photo, see Appendix Fig. 31). This was respectively the program name and official designation of a super attack helicopter that hopefully would solve the firepower problem. In the meantime, Bell Aircraft Company pressed the Army to accept an interim attack model.<sup>51</sup>

The new Air Force Chief of Staff, General John McConnell, was more pragmatic than his predecessor. Unlike LeMay, he had some tactical air background, having commanded such units in the Far East during World War II and in Europe afterwards. He and Secretary Zuckert moved toward some possible compromise measure concerning CAS planes, and proposed to McNamara in February 1965 that the Air Force purchase two wings of F-5s. Additionally, in summer that year they quickly deployed twelve F-5s to Vietnam for an operational evaluation. OSD delayed its response to the procurement request, perhaps because it wanted to see how the F-5 fared. The results by autumn 1965 were obvious, given the F-5's design. Most of the pilots liked its sportscar qualities and, at first, its maintainability also was good. But others still preferred the A-1, especially since the F-5 had only a fraction of that plane's loiter, load carrying, and slow speed

<sup>&</sup>lt;sup>50</sup>First quote is from Neufeld, <u>Georgi</u>, 20. Second quote is from Hasdorff, <u>Hildreth</u>, 60. Hildreth said that his superiors assigned him to the A-7 because he was the junior staff officer, and "no one wanted to touch that A-7" (59). Heyman's ensuing study is from Head, 257.

<sup>&</sup>lt;sup>51</sup>Helicopter developments are from Walter Andrews, "Rugged Tests and a Rugged Machine," <u>Armed Forces Journal</u> 106 (14 December 1968): 17 (AAFSS development milestone chart); Bradin, 111-121; and Futrell, <u>Ideas</u>, vol. II, 189.

characteristics. And probably because the Air Force rushed the plane into active service, it developed various mechanical problems due to the combat operations tempo.<sup>52</sup>

As the F-5 encountered its problems, the Pike Committee blistered the Air Force in its hearings. The Air Force Pentagon staff had at the same time sanctioned yet another study to determine whether the F-5, the A-7, or a stripped-down F-4 were most suitable for CAS. The study, presided over by Air Force Colonel Howard Fish and subsequently known by his name, was a monstrosity based upon a computerized massive air war featuring several different combat scenario models. The setup was so complicated that, by November, no one could really make anything of the information it produced—much of which depended upon what biases one entered into the computer. Not surprisingly, a split over the best procurement action developed. OSD staff was on one side pressing hard for the A-7 as a cost-effective attack plane solution for two services; TAC staffers formed another side which wanted a supersonic air superiority plane; and some Air Force Pentagon staff wanted a small number of A-7s simply to get outsiders off their backs. So intense were opinions that in his results briefing to General McConnell, Colonel Fish only presented the options and their basis instead of the traditional recommendation for a single course of action.<sup>53</sup>

General McConnell saw the military and political realities, and on 5 November 1965 opted for A-7 procurement. In later discussions, he said that he "didn't pay too much attention to the computer study." More pressing was:

<sup>&</sup>lt;sup>52</sup>McConnell background is from his Biographical Sketch, provided in Congress, Senate, Hearings before the Preparedness Investigating Subcommittee of the Committee on Armed Services, <u>U.S. Air Force Tactical Operations and Readiness</u>, 89th Cong., 2d sess., 9-10 May 1966. 2-3. Davis, <u>31 Initiatives</u>, 19, believes his background had some effect upon his subsequent decisions. F-5 deployment and difficulties are from Head, 273; McConnell testimony in Senate, Hearings, <u>Air Force Tactical Operations</u>, 9 May 1966, 37; and Schlight, 88-90.

<sup>&</sup>lt;sup>53</sup>A good account of the Fish Study and divided opinion is in Head, 258-271, 276-279. Hildreth told his interviewer that "Right at the end the decision was made to buy the A-7, and they were still fighting the program. Everybody. TAC and everybody." See Hadorff, <u>Hildreth</u>, 60.

considerable pressure by certain elements in the military and by certain elements in the Congress because they said we had never provided a capability or a specialized airplane for close air support of the Army. At the same time, the Army was coming in with a strong close air support proposal which was the AH-56, the advanced helicopter. In order to demonstrate that we did want to give the Army every possible means of close support--and I know that we can do it better than they can, particularly with the AH-56--we opted for the A-7 in sufficient quantities to provide close support for the Army in an environment that did not have intensive air defenses.

The above statement reflected McConnell's acute awareness of what the AH-56 represented, and in congressional testimony he expressed his assessment of the threat involved in this issue and the consequences of ignoring it: "The thing that was pushing was that we had to get something to give the Army close air support. First, it was our job. Second, if we didn't do it, somebody else was going to do it for us." That "somebody" was the Army itself, with the attendant threat of lost tactical aircraft funding.<sup>54</sup>

The former DDR&E and incoming Air Force Secretary, Harold Brown, later spoke of the warfighting implications involved:

It was perfectly clear by late 1965 and early 1966 that the Air Force was going to be put to the test both by the existence of the Vietnam War and its nature--however representative or unrepresentative they would be of a war somewhere else--and by Congressional interest and by OSD interest .... therefore it [the Air Force] had to look at the question of close air support specifically, and not just say as had been part of doctrine ... within the Air Force for many years, that whatever can fight the air battle can then go ahead and do the Close Air Support role. I think there was coming to be an awareness in the Air Force that, as a result of constraints inherent in limited war, you might not be able to fight the air war.

In other words, some Air Force leaders began to realize that their former procurement policies risked loss of control to outside agencies, and that there were other wars besides

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<sup>&</sup>lt;sup>54</sup>First McConnell quote is from his 6 May 1970 interview by MAJ Head, cited in Head, 281-282. The second McConnell quote is from his testimony in Congress, Senate, Hearings before the Subcommittee of the Committee on Appropriations, <u>Department of</u> <u>Defense Appropriations for Fiscal Year 1970. Part 4. Department of the Air Force</u>, 91st Cong., 1st sess., 29 July 1969, 122. His third quote is from the interview with Head, 280.
the projected European one with the Soviets. Thus, neither the F-4 nor the F-5 was acceptable.<sup>55</sup>

The Air Force had taken a momentous step in acquiring a subsonic tactical jet dedicated to air-to-ground weapons delivery. A number of factors converged to produce this decision, and one would think that the A-7 buy settled things. This was not to be, because the forces that brought about and opposed this move were not spent yet. The new Air Force Secretary, and former McNamara Whiz Kid, Harold Brown, saw the A-7 buy as an interim measure in the process of getting a more CAS-capable plane. The Vietnam War continued, which guaranteed that the Army still wanted attack helicopters to help fight the Vietnamese communists. Several Air Force generals fervently believed that the A-7 was an unwanted, inferior plane that Congress and OSD forced upon them, but so far, that pressure consisted only of public embarrassment in congressional hearings and continual prodding by OSD staffers.<sup>56</sup> With the Army proceeding with all deliberate speed toward buying attack helicopters, at least Chief of Staff McConnell realized that Congress and OSD could eventually grant CAS responsibility and funding to the Air Force's parent service. This would be a costly and humiliating loss for the Air Force, given its fight for

<sup>&</sup>lt;sup>55</sup>Brown quote is from 8 April 1970 interview with MAJ Head, cited in Head, 281. In a 30 July 1997 letter to the author, Brown wrote that the Air Force needed to provide CAS to the Army across the combat spectrum from Vietnam to Europe.

<sup>&</sup>lt;sup>56</sup>In his letter to the author, Brown wrote that the A-7 was "an interim step in the way of a low cost ground attack aircraft." A number of Air Force leaders remained convinced that either Congress or the Whiz Kids forced their service to buy the A-7; see Neufeld, <u>Burns</u>, 25-26 (Burns did not think so-but he acknowledged interviewer Neufeld's claim that many other generals thought otherwise); Neufeld, <u>Georgi</u>, 19 ("We were ... overridden by the dollars crowd."); <u>Ruegg</u>, 139.

The belief persists, too. Robert Coulam's 1977 history of F-111 procurement, <u>Illusions of Choice</u>, contains a footnote asserting that the A-7 was an OSD-imposed purchase and even states that the A-10 was a "possible" supporting case; see Coulam, 165*n*. Doc Pentland makes the same assertion in his 1988 "Evolution of A-10 Mission Requirements" study. And in his 1990 report for the Air University's Airpower Research Institute, Air Force LTCOL Harold Gonzales writes that McNamara "ordered" the service to buy A-7s; see Gonzales, <u>Tactical Air Support of Ground Forces</u>, 55.

independence and its leaders' desire to control all means of air combat. The service was not by any means done with the CAS plane issue.

#### CHAPTER V

### THE A-10'S IMPROBABLE CONCEPTION, 1966-1970

The Air Force's decision to buy the A-7 in November 1965 represented a major departure from that service's supersonic, air-to-air capable, tactical plane policy. However, the factors that converged to spur this development remained and intensified throughout 1966. The Pike Committee's published its hearings report that February, and its findings castigated the Air Force for not producing specialized air support planes. As the Vietnam War escalated during the year, the A-1 continued its impressive performance and received more favorable attention. The war's exigencies also led the Air Force and Army Chiefs of Staff to attempt in April a resolution of air support disputes. But as Army helicopters encountered tougher defenses and more fire support requests in Vietnam, Army leaders continued work on the AH-56 Cheyennne advanced attack helicopter project while buying an interim attack model, the AH-1 Cobra.

Thus, the Air Force perceived a serious threat to its CAS mandate from the very service it was supposed to support, and it acted quickly to present its bona fides to that customer-cum-rival service. Initial A-7 flight tests revealed that the plane had certain deficiencies regarding CAS. That summer, urgent conferences and studies addressing the CAS plane issue led the pragmatic Air Force Chief of Staff John McConnell to order a design concept study of a dedicated CAS plane, designated the A-X, in September 1966.

Nonetheless, the A-X program had tenuous support. The Air Force still wanted to see how well the Cheyenne project fared, and there were those within the service who still opposed the CAS plane idea. In the meantime, the relatively small group of Air Force and OSD staff who were interested in the design worked to create a plane that would eliminate the need for a Cheyenne. They also wanted an improvement on the A-1 that could accomplish CAS in any theater—not just in a war such as that in Vietnam, which after 1968 witnessed decreasing American involvement. They formulated a design concept featuring four characteristics which must govern actual construction: lethality, maneuverability, simplicity, and survivability.

The project encountered problems and delays. Haggling over design details delayed the date when a real CAS plane would be operational. Further, OSD's Director of Defense Research and Engineering asked for further clarification of some of the design's details. Finally, the Cheyenne encountered serious problems, which cooled the Air Force's initial rush to build a CAS plane.

However, Congress entered the scene in 1968 with questions about why it should fund either of the two aircraft. A sick national economy, skyrocketing warplane costs, and the Vietnam War irritated many congressmen and made them skeptical about military aviation projects. In 1969, the House temporarily withheld funds for the A-X, stirring a lethargic Air Force to greater efforts on behalf of it. Congressional pressure also helped force a critical agreement between the Army and Air Force secretaries to declare the A-X and Cheyenne complementary instead of competitive weapons systems.

The delays, pressure, and a presidential administration change also changed the A-X's development and design. President Richard Nixon's defense staff favored cost goals and competition between prototypes to reduce some of the scandalous costs of recently procured military aircraft, such as the C-5 and F-111. The Air Force favored this approach for the low-cost, simple A-X, given that it planned big outlays for its higher priority projects, such as the F-X and B-1. Thus, the A-X project became the first Air Force plane in many years to feature a flight competition between the leading candidate planes and the first-ever American military plane held to a design cost goal. The delays created time for further development of the gun that would so define the plane. They also allowed for technological progress, in the form of turbofan jet engines, to change the design from a turboprop plane to a jet.

As 1970 ended, Congress still expressed skepticism about the A-X, and many trials remained. But circumstances had yielded a well-conceived design developed via an innovative, efficient development process. Twelve contractors submitted bids to produce designs, and the best two would later compete in an actual flying competition to determine which the Air Force would choose.

# The Pressure Continues and Increases

If the Air Force thought that the congressional heat would subside following its selection of the A-7 two months after Otis Pike's committee adjourned, it was wrong. In February 1966, the committee released a report that spent half of its fourteen pages scoring the Air Force for its tactical plane selection. Concerning CAS, the report stated of the service: "It has never developed one plane for this particular purpose. It is not developing one today. In fact, it insists upon multipurpose aircraft." The committee believed the reason was that in the service's "magnificent accomplishments in the wild blue yonder it has tended to ignore the foot soldiers in the dirty brown under." In the report's final sentences, the committee hoped that it would serve as a "useful prod."<sup>1</sup>

It was also during 1966 that Colonel Eugene Deatrick served his tour as A-1 squadron commander. The plane showed its qualities in 1966 battles as it had in 1965. Given this, and the Pike Committee findings about the plane, service leaders asked Deatrick to brief them on the plane. He praised the A-1 and its CAS strengths.<sup>2</sup>

The Air Force's selection of the A-7 did not slow Army efforts to procure an attack helicopter. Vietnam saw to that. In the same month that the Air Force announced its intention to buy the plane, the Army capped a two-year review of AAFSS contract proposals by selecting Lockheed Aircraft Company to build the new helicopter. Lockheed's design for the AH-56 Cheyenne "exceeded the Army's wildest expectations," as one Army aviation historian put it. It sported an innovative combination of propulsion and lift features: stubby wings, a main rotor, and a pusher propeller. The rotor assembly itself

<sup>&</sup>lt;sup>1</sup>Congress, House, Report of the Special Subcommittee on Tactical Air Support of the Committee on Armed Services, <u>Close Air Support</u>, 89th Cong., 2d sess., 1 February, 1966, 4872 (first and second quotes), 4873 (third quote). The report also documented the Air Force's resisting development of a COIN/LARA (Counter-Insurgency/Light Attack and Reconnaissance) aircraft (4865).

<sup>&</sup>lt;sup>2</sup>Deatrick, interview by author; Porter, "Second Defense of Lima Site 36," iv, 5, 6; The Honorable Harold Brown, "The Air Force Role in Southeast Asia," in <u>Supplement to</u> <u>the Air Force Policy Letter for Commanders</u>, #3-1968 (Washington, D.C.: SAF-OII, March 1968), 32. MGEN Hildreth also accomplished his squadron commander's tour in 1966.

was revolutionary for helicopter technology, in that it was more rigidly constructed than conventional rotors. The result was that the Cheyenne could fly at 210 knots, which was not only an unheard-of speed for a helicopter but also nearly as fast as the A-1. The unique aerodynamic design also allegedly permitted it to drop bombs from a dive delivery like the A-1 and other fixed-wing planes. But the Lockheed designers went further. They gave the Cheyenne an impressive weapons package, including a turret-mounted 30 mm (millimeter) gun, a 40 mm grenade launcher, rocket and bomb pylons, and a laser range finder--all told, an alleged capability to haul eight-thousand pounds of ordnance. The Cheyenne's capacity for carrying weapons did not equal that of the A-1, but it was outstanding for a helicopter. Finally, Lockheed incorporated a most advanced all-weather avionics package--"more complicated than a B-52," as one observer put it--that included terrain-following radar, inertial navigation systems, and an autopilot.<sup>3</sup>

Lockheed's daring ambition for the Cheyenne was one factor which would eventually kill the program. One omen of later difficulties was that the company could not deliver the aircraft soon enough to meet the Army's urgent need for attack helicopters to defeat tougher air defenses in Vietnam. In the meantime, Army leaders bought an interim attack helicopter that Bell Aircraft Company built on its own initiative, the AH-1 Cobra (for photo, see Appendix Fig. 32). Though not nearly as impressive a design as the Cheyenne, the sleek Cobra could nonetheless travel fast enough and carry enough weapons to escort transport helicopters and provide some direct fire support for troops in battle.<sup>4</sup>

The Cheyenne and Cobra were unmistakably CAS machines, but could the Air Force's A-7 match them? By spring 1966, the service saw that the answer was no. The

<sup>&</sup>lt;sup>3</sup>Walter Andrews, "There Are No Red Flags," <u>Armed Forces Journal</u> (henceforth known as <u>AFJ</u>) 106 (14 December 1968): 20-23; Bradin, <u>Hot Air to Hellfire</u>, 115 (quote), 116-117 (design discussion); GAO, <u>Close Air Support: Principal Issues and Aircraft</u> <u>Choices</u>, 12-14; and Hessman, and others, "The Army Gets a New Weapons System," 7-10. The last quote is from unnamed source in Bill Gunston, <u>AH-64 Apache</u> (London: Osprey Publishing, 1986), 3.

<sup>&</sup>lt;sup>4</sup>Bradin, 118-122. Bradin writes that the North Vietnamese and Viet Cong specifically introduced 12.7mm heavy machine guns and 30 mm light antiaircraft cannon to counter the American helicopter threat.

plane made its first flight in September 1965, and subsequent test flights confirmed that its takeoff and landing rolls were very long, and that it lacked maneuverability. The Air Force also wanted to substantially upgrade the A-7's weapons delivery avionics from the antiquated system that the Navy installed, and this sharply increased the plane's cost. As such, the A-7 could not meet CAS mission requirements as well as the Army's own Cheyenne. Not even a year after buying the A-7, the Air Force found itself in another air support roles-and-missions crisis.<sup>5</sup>

#### An Agreement and a CAS Plane Decision

In the early spring of 1966, Air Force Chief of Staff John McConnell and Army Chief of Staff General Harold Johnson met secretly to iron out simmering air support differences that the Vietnam War had aggravated. Both leaders apparently feared a war-driven, inter-service clash which OSD or Congress might settle in a manner not to their liking. Experience in various Vietnam battles demonstrated that the Air Force provided airlift support as well or better than the fixed-wing transport units the Army had created in the previous ten years. Vietnam combat also cemented the Army's attachment to its helicopters, and this included the ready fire support they provided when battle

<sup>&</sup>lt;sup>5</sup>Dr. John Foster, Department of Defense Director of Defense Research and Engineering (DDR&E), "Development Concept Paper, AX Close Air Support Aircraft," (DCP No. 23), December 1968, 2, 11, supporting documents; Goldberg and Smith, 33; Head, "A-7," 337, 415 (sees the A-7's deficiencies as a driving factor in McConnell's decision for the A-X); LTCOL Richard Head, USAF, "The Air Force A-7 Decision: The Politics of Close Air Support," <u>Aerospace Historian</u> 21 (Winter, December 1974): 224 (article based upon dissertation; observes that by 1969, the A-7 cost as much as the F-4); COL Avery Kay, USAF (ret.), 16 March 1997, telephonic interview by author, recording and notes in author's possession (served as an action officer in the A-X program and recalled that the Army dismissed the A-7 as a band-aid fix and not a true solution to its CAS needs); GEN John McConnell testimony in Congress, Senate, <u>Department of Defense Appropriations for Fiscal Year 1970, Part 4</u>, 29 July 1969, 122; GEN William Momyer testimony in Congress, Senate, Hearings, <u>Close Air Support</u>, 29 October 1971, 194; and Pierre Sprey, interview by author, 4 May 1997.

Head's dissertation research on the A-7's procurement was helped not only by his air combat experience, which included flying A-1s in Vietnam, but also by his tour as the Military Assistant to the Under Secretary of Defense for Policy.

conditions demanded it. Likewise, Army aviators pressured their leaders to arm that service's OV-1 reconnaissance planes, something one OV-1 unit did in the war's early days until angry Air Force leaders successfully demanded that it disarm. Indeed, this latter item was one example of why McConnell and Johnson kept their discussions secret. As evidenced by the behavior of McConnell's predecessor LeMay, many Air Force leaders wanted no mission ceded to the Army. For his part, Johnson dealt with Army aviation activists who wanted to assert that service's domain not only over helicopters, but any fixed-wing aviation directly supporting Army activities. These officers had fought hard to get fixed-wing transports and reconnaissance planes for their service, and did not want to relinquish that hold now.<sup>6</sup>

The April Agreement basically shifted the criterion for aviation responsibility from aircraft weight to aircraft type. The Air Force would still provide CAS, but recognized the Army's use of helicopters for various missions to include fire support. The Army ceded its large fixed-wing transports to the Air Force. Additionally, the Air Force kept some helicopters for SAR work, and the Army kept some fixed-wing planes for observation and

<sup>&</sup>lt;sup>6</sup>GEN Robert Williams, telephonic interview by author (Williams became Director of Army Aviation the day after the agreement and recalled that subordinates in both services opposed it. He believed that GEN Johnson's rationale was to give up the fixed-wing transports in order to secure the Army's right to use and develop helicopters); Bergerson, 117-119; Davis, <u>31 Initiatives</u>, 19-20; Futrell, <u>Ideas</u>, vol. II, 312-313; Goldberg and Smith, 29-31; Head, "A-7," 335-337 (sees the agreement as a defensive move by the Air Force against the Cheyenne and Army encroachment into fixed-wing airlift; also sees it as an overall Army victory); "Look but Don't Shoot," <u>Command: Military History.</u> <u>Strategy & Analysis</u> (December 1997): 10-14; and Schlight, 122-124.

That the Air Force seriously monitored violations of its mission prerogatives appears in the fact that it successfully forbade Navy special operations OV-10s to drop bombs in combat, though the planes had that capability. See prepared statement of Mr. David Isby (Analyst and Historian for Washington think-tank BDM Corporation) in Congress, House, Hearing before the Investigations Subcommittee of the Committee on Armed Services, <u>Roles and Missions of Close Air Support</u>, 101st Cong., 2d sess., 27 September 1990, 15.

liaison--but not fire support. Subordinate officers in both services chafed at the agreement, but it represented an encouraging pragmatism on the part of both service leaders.<sup>7</sup>

The Johnson-McConnell Agreement, as it became known, solved overall aircraft type-versus-mission problems between the two services, but like previous interservice accords, it did not sort out all specifics. The technology represented by the Cheyenne still threatened to duplicate the Air Force CAS mission as A-1s flew it in Vietnam. In June 1966, the Army capped its initial development work with Lockheed by presenting a Cheyenne mock-up. Also, by this time Bell Aircraft neared production of its first Cobra for the Army, whose expenditures on helicopters had risen accordingly.<sup>8</sup>

General McConnell did not sit idle. Also in June 1966, he ordered Major General Richard Yudkin, his Director of Doctrine, Concepts, and Objectives, to conduct a roles-and-missions study. This was the directorate's charter, but as some former Pentagon staffers observed, its job was more specifically to study *defense* of Air Force roles and missions. As early as 1964, the Directorate had an officer, Colonel Ray Lancaster, assigned to monitor Army development of an armed helicopter and assess its implications for the Air Force. To Lancaster, the Cheyenne was an expensive "monstrosity" representing nothing less than "the Army wanting to take over the close air support mission." The mock-up unveiling spurred him to support any effort to build a successful rival. Another Doctrine, Concepts, and Objectives staffer of the time, Colonel Avery Kay, recalled that the Army probably had a legitimate complaint against the Air Force

<sup>&</sup>lt;sup>7</sup>"Agreement between Chief of Staff, U.S. Army, and Chief of Staff, U.S. Air Force," 6 April 1966, reproduced in Wolf, <u>Basic Documents on Roles and Missions</u>, 382-383. Wolf provides a short section describing the agreement, and provides the Chiefs' preamble, on pages 379-381. Most of the citations in the previous footnote also describe the agreement's terms.

<sup>&</sup>lt;sup>8</sup>Bradin, 122 (Cobra time line); Davis, 23 (by 1966, the Army possessed 5632 helicopters; by comparison, the Air Force owned 18,000 aircraft of all types); and Andrews, "Rugged Tests and a Rugged Machine," 17 (Cheyenne time line).

Air Force's authority to conduct that mission and thus drove the service to answer it. A possible secondary reason for McConnell's choice of Yudkin was that Yudkin was a non-aviator who might provide a disinterested view of the Army's helicopters and the potential need for a CAS plane to counteract it. Indeed, TAC commander General Disosway did not hide his contempt for any such plane: "I was very much opposed to it. I argued with McConnell about it . . . . He said, 'No, we have to do that for the Army.'"<sup>9</sup>

Yudkin and company were undaunted. By this time, there were not only favorable reports from Vietnam about the A-1, but there were also A-1 pilots returning to the

<sup>&</sup>lt;sup>9</sup>COL Kay, interview by author; COL Ray Lancaster, USAF (ret.), 18 April 1997, telephonic interview by author, tape recording and notes in author's possession; Sprey, interview by author ("monstrosity" and "take over" quotes); and MGEN Richard Yudkin, USAF (ret.), 15 March 1997 telephonic interview by author, tape recording and notes in author's possession. (Yudkin said that the office was formerly named "Long Range Plans" until a political flap over an officer's alleged release of documents to Senator Barry Goldwater's 1964 presidential campaign made the name too controversial.) Disosway quote is from Dick, <u>Disosway</u>, 180. Other accounts of McConnell's action are from Goldberg and Smith, 31-33; and Mischler, 15-16.

Ironically (or perhaps deliberately), the service's professional journal, Air University Review, published two competing views of slow-moving versus ever-faster tactical planes in its May-June 1966 (Vol. 17) issue. Air Force COL William Scott's "The Rise and Fall of the Stuka Dive Bomber" cites the Stuka's inability to help maintain air superiority as a warning against buying a dedicated attack plane lacking air-to-air prowess. COL Scott's other Stuka experience lesson was that the service should not get too preoccupied with meeting Army needs in conventional wars like Vietnam and Korea, lest it end up with Stuka-like planes in the big war with the Russians. Hans Multhopp, in his "The Challenge of the Performance Spectrum for Military Aircraft" (30-41), questions the Air Force's slavish pursuit of faster fighters when the current ones paid dearly for speed via increased takeoff/landing rolls, fuel inefficiency, poor agility, and negligible ability to attack and reattack ground targets. Multhopp was an aerodynamic engineer who designed jets for Nazi Germany and later for the Western powers. While working for the Martin Company in 1966, Multhopp proposed a design for an inexpensive, maneuverable ground attack plane built around a gun, which Martin had to dismiss because of unspecified problems involved with getting a contract to build the plane. (The information in the last sentence is courtesy of author's interviews with Chuck Myers. Myers attended Multhopp's briefing on the design, and passed some of the details on to Pierre Sprey, who influenced the A-10's design. Sprey told this author that Multhopp's ideas had some effect upon his thinking.)

Pentagon to serve their staff tours. They helped influence Yudkin and his office staff, who worked through the summer to present findings to General McConnell. (One of the Yudkin's subordinates, Captain Robert Winger, was one of those A-1 pilots.) Yudkin briefed the Chief of Staff in August, telling him that though the Army was satisfied with Air Force CAS in Vietnam, current Air Force jet fighters possessed a poor to unsatisfactory helicopter escort and direct fire support capability. The Army filled the gap with its armed helicopters, and Yudkin recommended that besides paying more official attention to CAS operations, the Air Force "should take immediate and positive steps to obtain a specialized close air support aircraft, simpler and cheaper than the A-7, with equal or greater characteristics than the A-1." Yudkin recommendations, but on 8 September 1966, he issued a decision paper directing his service to develop and procure a dedicated close air support plane, which for the time being would be called the A-X--and after years of development and struggle, the A-10.<sup>10</sup>

<sup>&</sup>lt;sup>10</sup>Fred Kaplan, "Beast of Battle, The Tale of the Warthog: How the Military Bureaucracy Almost Grounded a Gulf War Hero," <u>Boston Globe</u>, 21 July 1991, 12; Kay, Lancaster, Sprey, and Yudkin, interviews by author; Goldberg and Smith, 33 (quote and report findings).

Kaplan portrayed Yudkin as taking the initiative and confronting other Air Force leaders. But in the author interview, Yudkin specifically rebutted Kaplan's account. Quite modest about his role in this decision, and professing ignorance of specific study motivations and details, he declared: "I didn't volunteer to take this up .... Someone else threw the ball to me and I don't know what caused them to throw it .... I not only got my feet wet [handling this issue] but I damn near drowned!" He also kindly reminded the author that he was in his eighties and that these events occurred thirty years before. Others, such as Sprey, have praised his courage in presenting a conclusion unpopular with many Air Force leaders, and thus consider his role pivotal. In this regard, see Jack Neufeld, Interview #859 of Colonel John Boyd (Washington, D.C.: USAF Oral History Program, 23 May 1973), 25, AFHRC Holding K239.0512-859. (Boyd was a legendary fighter pilot, warfighting theorist, and aircraft designer who served in the Pentagon around this time.) Yudkin also mentioned that RAND (the Air Force's renowned private research agency) experts also considered a CAS plane necessary, something confirmed by former Defense Secretary James Schlesinger, who served at RAND during that time, telephonic interview by author, 22 April 1997, tape recording and notes in author's possession. Yudkin told the author that the Chief of Staff and other senior staffers attended briefings like this, and he could remember no unusual response to this particular one. Finally,

Thus, for the first time in its existence as a separate service, the Air Force moved to build an airplane dedicated to the CAS mission, something many of its leaders then and later believed that it could not, and would not, do. In a 1989 interview with the service weekly newspaper Air Force Times, former Air Force Vice Chief of Staff Robert Mathis dismissed the A-10 as an "aircraft designed for the last war and pushed through by a coalition of lawmakers from the Northeast and influential staff members." The statement reveals that Mathis held an impression of the plane's birth similar to what earlier leaders believed about the A-7--that ignorant or malignant civilian policy makers forced it upon a properly unwilling service. The same article, written during a later service effort to divest itself of the A-10, openly mentioned that Air Force leaders resisted the plane, so it is important here to ponder what sparked its creation and development. The central motivation was to counteract the Army's Cheyenne project and the threat it posed. As Pierre Sprey, one man intimately familiar with the A-X project, put it: "The A-10 was invented strictly to defeat the Cheyenne." Indeed, a cartoon in a 1968 Armed Forces Journal issue poked fun at the Air Force effort by showing a winged tank sitting behind a "Tactical Air Command" sign. An Air Force general glares at the craft while a subordinate says to him: "No sir General it won't fly, but it will sure scare hell out of the Army!!" However, other factors helped create both the Cheyenne and the Air Force dedicated CAS plane, the A-10. The man whom Sprey praised as a key player in the plane's conception, Richard Yudkin, said of the Chevenne-only theory of the A-10's birth: "You make a mistake if you oversimplify it that way."11

Yudkin said that in private meetings with McConnell, the Chief of Staff did not confide to him the reasons for his decision.

<sup>&</sup>lt;sup>11</sup>Mathis comment is in David Fulghum, "A-7F Makes Comeback as Temporary Solution," Defense Trends Special Section, <u>Air Force Times</u> (25 September 1989): 4. (The author notes the article's ironic title, given the story of both the A-7's and the A-10's birth. But it indicates the level of some Air Force leaders' contempt for the A-10 that in the late 1980s, they considered modifying the A-7, an attack plane that earlier Air Force leaders despised, to replace it.) Sprey quote is from Neufeld, <u>Sprey</u>, 37, 38 (quote); cartoon quote is from Walter Andrews, "A Weapons Ship for All Environments," <u>AFJ</u> 106 (14 December 1968): 13; and Yudkin quote is from author's interview.

The Vietnam War revealed Air Force weaknesses in waging both conventional and guerrilla war. General McConnell revealed in a 1968 speech that the service needed to prepare for other types of war besides the nuclear one. McConnell added that this meant the service was developing "new equipment, new applications, and new tactics which will greatly enhance our ability to deal with similar conflicts in the future." McConnell's words reflected a significant departure by the Air Force leadership from the nuclear-oriented warfighting doctrine it had followed from its 1947 birth (though, as shall be seen, only a temporary departure from emphasizing readiness for a high-technology conventional war with the Soviets in Europe).<sup>12</sup>

Of course, Army helicopter histories see the A-X as a direct answer to Cheyenne; see Bergerson, 126, 131; and Bradin, 123. Three senior officers-one from the Air Force and two from the Army-associated with Cheyenne and A-X matters at the time also believed that Cheyenne was the sole reason for the A-X's birth: GEN Williams, interview by author; MGEN Benjamin Harrison, USA (ret.), "The A-10: A Gift the Army Can't Afford," <u>Army 41</u> (July 1991): 36-39 (memorable line: "Indeed, the A-10 was illegitimate in conception." p. 39); and Dick, <u>Disosway</u>, 180. William Smallwood's excellent account of the A-10 in Desert Storm leaves the question of the A-10's birth unanswered. He does, however, present a version which says that the Army's pursuit of a fixed-wing plane scared the Air Force into building a CAS plane; see Smallwood, <u>Warthog: Flying the A-10 in the Gulf War</u> (Washington, D.C.: Brassey's [U.S.], 1993), 10-11. There is nothing-other than the Cheyenne-that supports the fixed-wing threat version; and Smallwood does not give it much weight either. In his telephonic interview with the author on 5 March 1997 (notes in author's possession), he said that he wanted to focus upon the pilots' wartime experiences more than previous history anyway.

<sup>12</sup>GEN John McConnell, USAF, "The Quest for New Orders of Military Capability," speech made to the Air Force Association (AFA) Convention at Atlanta, GA, 4 April 1968, reprinted in <u>Air Force & Space Digest</u> 51 (June 1968): 121-123 (quote, 122). There is also his testimony in Congress, Senate, Preparedness Investigating Subcommittee of the Committee on Armed Services, <u>U.S. Tactical Air Power Program</u>, 90th Cong., 2d sess., 28 May 1968, 80-82, 102 (explains that aviation technology progress and different warfighting environments require specialization; GEN Disosway claims that he believes the same thing on p. 113). See also LTGEN Lucius Clay, Jr., Headquarters Air Force Deputy Chief of Staff, Plans and Operations, "Shaping the Air Force Contribution to National Strategy," <u>Air University Review</u> 21 (March-April 1970): 3-9, (also calls for more balance in Air Force combat orientation); and Worden, <u>Rise of the Fighter Generals</u>, 169-170 (discusses McConnell's frustrations with the Air Force's Vietnam performance). Air Force Secretary Harold Brown made similar points in public Vietnam also accelerated the Army's development of armed helicopters, something it started in the 1950s partially out of frustration with Air Force neglect of CAS. One Air Force leader involved with Air Force-Army issues throughout his career asserted that the Army's helicopter efforts and the ensuing Air Force CAS plane decision boiled down to one question—who controlled air assets in the CAS mission. General Robert Dixon worked joint-service issues in the Pentagon staff in 1966, helped General Yudkin with the CAS roles-and-missions study, and later led TAC toward greater cooperation with the Army. In an interview years after his retirement, he said that one should not merely focus upon Army helicopter development, for this was merely the symptom of the deeper issue of who owned the CAS aircraft. To him, it was natural for organizations to want control over activities related to their function, and one could add that this urge increased when the heat of battle demanded a military unit's rapid response to save a situation. Dixon said that the Air Force created a CAS plane in order to prove it would respond to Army needs and thus prevent an Army seizure of the CAS mission.<sup>13</sup>

<sup>13</sup>GEN Robert Dixon, USAF (ret.), telephonic interview by author, 13 April 1997, recording and notes in author's possession. In their interviews with the author, neither Dixon nor Sprey believed that McConnell's more diverse background made him more receptive to buying a CAS plane. To them, he was still primarily a bomber general who faced a threat to one of the service's missions and responded accordingly. The author disagrees because he cannot see LeMay making the same decision. LeMay sharply resisted outside pressures for a more conventional war orientation until his 1964 retirement. McConnell showed courage in his decision because many of his high-ranking subordinates, such as TAC's Disosway, vehemently opposed it.

speeches, and COL Kay told the author that design staffers cited Brown's words when they encountered resistance during A-X concept development. Two Secretary Brown speeches on the need for different types of planes for different air war environments are "The Air Force Role in Southeast Asia," made to the Michigan Aeronautics and Space Administration, Detroit MI, 2 February 1968, reproduced in <u>Supplement to the Air Force Policy Letter for Commanders</u> No. 3-1968 (Washington, D.C.: SAF-OII, March 1968): 25-34; and "The Next Twenty Years in the Life of the Air Force," made to Air Force Association Luncheon, Dallas, TX, 25 March 1966, reproduced in <u>Supplement to the Air Force Policy Letter for Commanders</u>, No. 4-1966 (Washington, D.C.: SAF-OII, April 1966): 2-7.

General McConnell did not specifically or publicly explain the reasons for procuring the A-X as he did for the A-7, and one possible reason why was because they were quite similar. Indeed, the A-7 was the precedent for (not predecessor of) the A-X, as the service broke with its supersonic tactical plane procurement policy. The Air Force needed to buy a plane which might answer congressional and OSD critics as well as the bureaucratic threat posed by the Army's attack helicopters. In congressional testimony, McConnell confirmed the A-7 shortcomings which helped drive the campaign for a dedicated CAS plane. And in a later interview, Air Force Secretary Harold Brown confirmed that he and General McConnell agreed about sincerely redressing Air Force CAS deficiencies, and that they both saw the A-7 as an interim gesture on the way toward a more capable CAS plane design.<sup>14</sup>

In summary, the Air Force neglected its air support commitments to the Army, as it had since the 1920s when it was an Army subordinate command. In the 1950s, atomic weapons developments and aviation technology advances further propelled it away from Army support and toward an all-supersonic bomber force. Its path created a doctrinal and performance void that in turn spurred Army efforts to create its own air force with helicopters and any other aircraft that it could obtain. The Vietnam War in the 1960s headlined glaring Air Force CAS deficiencies (as well as other conventional war shortcomings beyond the scope of this work) and quickened Army efforts to produce attack helicopters that could escort other helicopters and provide direct fire support in the landing zone. Additionally, OSD staffers and congressmen pressured Air Force leaders to adapt to different warfighting scenarios, as well as meet their Army support commitments.

<sup>&</sup>lt;sup>14</sup>"Air Force Secretary Brown: "Tactical Air Power ... a Vital Element in the Application of Military Forces," <u>Armed Forces Management</u> 13 (October 1966): 66-68 (interview with both Brown and McConnell reveals their commitment to strengthening tactical air forces, to include CAS capability); <u>Department of Defense Appropriations for</u> <u>Fiscal Year 1970, Part 4</u>, 122; and Harold Brown letter response to author's written interview questions, 30 July 1997. Air Force BGEN William Georgi, who worked fighter requirements issues in TAC Headquarters during this time, also mentioned that the Air Force went for the A-X because its leaders believed the plane could do CAS more effectively than the Army's helicopters; Neufeld, <u>Georgi</u>, 24-25.

All of these pressures led the service to procure a subsonic attack plane, the A-7, which still did not specifically answer the Army's needs. That service's continuing advanced attack helicopter development represented a true threat to Air Force CAS prerogatives and funding. Thus the Air Force commenced development of a dedicated CAS plane, something it had not done since the inter-war years and certainly not since its formal birth in 1947. The questions that remained were how long would this confluence of issues continue so the project could survive? And perhaps more importantly, given differing impressions of CAS, what would be the plane's design?

#### Design Concept Work

Air Force generals who served in subordinate senior leadership and staff positions during the time of the CAS plane's development used such terms as "stupid plane" and "ridiculous" to describe it. Thus, it was not only the Air Force's fear of Cheyenne, but also McConnell's fear of his own subordinates scuttling the project, that Yudkin's Doctrine, Concepts, and Objectives shop retained some oversight of A-X development in the ensuing couple of years. (The project would normally have been the sole responsibility of the Directorate of Research and Development, Operational Requirements and Developments Plans [office symbol AFRDQ], the Air Force Pentagon department associated with aircraft design.) In order to determine what deficiencies the A-X had to redeem, Yudkin's staffers had a chart showing the performance capabilities of the Air Force's fighters as they stacked up against the Cheyenne. The F-4 and F-105 failed utterly, while the A-7 (still in testing) lacked maneuverability.<sup>15</sup> But the officers needed further expertise, and Yudkin invited

<sup>&</sup>lt;sup>15</sup>Kay, Lancaster, Sprey, and Yudkin, interviews by author. Lancaster spoke of keeping the chart, which he asserted had one function: to better aid design concept staffers construct a plane that would eliminate the need for Cheyenne. An Army officer familiar with the A-X and Cheyenne projects during this period confirms these activities; see Harrison, "A Gift the Army Can't Afford," 37-38. Yudkin said that McConnell had to forcefully tell his subordinates to support the project. Thus, Yudkin expected foot-dragging by AFRDQ staffers, and stayed with the program to keep it alive. Sprey was more emphatic about the opposition. He asserted that these staffers tried to kill the program, and General McConnell assigned Yudkin's office to participate in concept development, which is what led Yudkin to bring in others. Kay recalled that General

more A-1 Vietnam veterans and a young OSD staffer who expressed interest in the A-X project from the start, Pierre Sprey, to participate in the concept formulation. Sprey was an aerodynamic engineer from Yale, whose short stint working at the large Grumman Aircraft Corporation revealed that "it would be twenty years before they let me design an aileron." After meeting one of McNamara's Whiz Kids at a symposium, Sprey became one himself, working tactical air combat matters on the staff of the Assistant Secretary of Defense for Systems Analysis. After finishing a controversial analysis study criticizing World War II air interdiction, Sprey became a close air support advocate, and offered his services to the Doctrine, Concepts, and Objectives staff. He would now influence more than the design of an aircraft aileron. Sprey was another person who stood out from the many people who helped make the A-10 a reality; in his case, he ensured that its design remained practical.<sup>16</sup>

Oral histories provide further examples of Air Force subordinate leader opposition during the A-10's developmental years. The former TAC staffer for fighter requirements, MGEN William Georgi, described the A-X as a force structure "problem" that could not serve effectively in many air war environments; Neufeld, <u>Georgi</u>, 17-19, 22 (quote), 23-25. LTGEN Marvin McNickle, who served as Deputy Chief of Staff for Research and Development from 1969 to 1970, called the plane "ridiculous"; Ahmann, <u>McNickle</u>, 114. LTGEN Dale Sweat, who was Deputy Chief of Staff for Operations at Headquarters U.S. Air Forces in Europe (USAFE) in 1968 and 1969, and was Vice Commander of TAC in 1972, said "I think the A-10 is a stupid plane to buy . . . I am not a fan of the A-10"; <u>Sweat</u>, 119. MGEN James Hildreth, who was Chief of the Tactical Support Division in the Headquarters Air Force Studies and Analysis Office in 1969, was concerned about the A-10's slow speed and declared that when it "spends a little time in the target area . . . you say, well, my god, [*sic*] you can shoot it down"; Hasdorff, <u>Hildreth</u>, 65.

<sup>16</sup>Quote is from Sprey, interview by author. Observers who credit Sprey with influence upon the A-10 project are James Burton, <u>The Pentagon Wars: Reformers</u> <u>Challenge the Old Guard</u> (Annapolis, Md.: Naval Institute Press, 1993), 24, 241 (Burton was an Air Force Colonel); Kaplan, "Beast of Battle," 12; James Stevenson, <u>The Pentagon</u>

Momyer, then commanding Seventh Air Force in Vietnam, sent Yudkin "nastygrams" about the A-X (though Yudkin reminded the author that Momyer's opposition was a doctrinal one based upon his combat experience and warfighting views). And in his Air Force Oral History interview, General Disosway recalled his vehement resistance to the plane; see Dick, <u>Disosway</u>, 180. Kay and Yudkin both said that Disosway and his staff coolly received their A-X briefing in 1967, and Sprey said that Air Force Headquarters concept designers invited TAC to participate in their A-X work, but TAC refused.

The initial result of this early work, which AFRDQ published in December 1966 as a Requirements Action Directive (RAD) to Air Force Systems Command, specified the same design details as Yudkin's August briefing to General McConnell: an improvement upon the A-1 without the complexity and cost of an A-7. They wanted it to be:

An important note here is that COL Boyd, COL Burton, Christie, Fredericksen, Myers, Spinney, and Sprey were all to some extent members of the 1980s "Military Reform" movement. Burton's and Stevenson's works both chronicle this group's experiences, and Burton calls the A-10 a "symbol of the 'Reform Movement'" (Pentagon Wars, 242). The reform group had its origins in the late 1960s/early 1970s "Gunfighter Mafia" which spurred creation of the A-10, F-15, and F-16, and that group included Boyd, Christie, Myers, Sprey, and Air Force COL Everest Riccioni, among others. One could dismiss the Sprey praise as group admiration, but these men had their differences in the various aircraft procurement crusades through the years. And author Stevenson, who started his F-18 history as a disinterested observer, endorsed their assessments of Sprey. Some other sources besides the above works for the Fighter Mafia are: Ingemar Dörfer, Arms Deal: The Selling of the F-16 (New York: Praeger, 1983), 4-11(like Stevenson, recounts the Mafia's responsibility for the F-16); James Fallows, National Defense (New York: Random House, 1981), 95-106 (Fallows was a newsman sympathetic to the Reformers; gives Sprey credit, along with Boyd and Riccioni, for the F-16); and Franklin C. "Chuck" Spinney, "Genghis John," Naval Institute Proceedings 123 (July 1997): 42-47 (praise for Boyd).

Paradox: The Development of the F-18 Hornet (Annapolis, Md.: Naval Institute Press, 1993), 100 (Stevenson also discusses the design thinking that went into the A-10, F-15 and F-16). Kay and Yudkin praised Sprey's work; and author personal interviews with Thomas Christie, 29 April 1997, Washington, D.C., tape recording and notes in author's possession; and Donald Fredericksen, 28 April 1997, Vienna, Va., tape recording and notes in author's possession, also reveal high regard (both men served in various high-ranking OSD positions during this time and later, and would have some impact upon the A-10's future). Burton, Christie and Stevenson observe that Sprey was extremely intelligent. Sprey never directly ran the program, but Christie adds that Sprey could marshall staffers to express his position. A forceful man, Sprey also fought with various recalcitrants throughout the procurement system to preserve his vision, and thus his "take" on Air Force leaders' opposition to the A-10 was uncompromising. In a 1973 interview with the Office of Air Force History, he averred, "The Air Force doesn't want it and they'll try anything to get rid of it .... It's perfectly clear that if there is no further threat from the Army, that airplane won't get bought"; Neufeld, Sprey, 37-38. Burton and Stevenson credit Sprey as a major influence in creating both the A-10 and the highly successful F-16 fighter, but Sprey told this author he was most proud of his A-10 work. "In the larger scheme of things, it's [the F-16] like an irrelevance compared to the A-10," he said. This was because CAS was "something that actually makes a difference in warfare," and "It was a real landmark trying to get the Air Force to do what it was supposed to do."

simple, lightweight, reliable, highly survivable and capable of operating from medium-length semi-prepared airstrips with a high utilization rate. It must be able to carry a large payload of mixed ordnance and deliver it accurately. It must have sufficient low-altitude range and loiter capability, airspeed range, and aerial agility to perform the entire spectrum of close air support missions.

The spectrum of CAS that the above statement envisioned was support of troops in close combat with enemy troops, helicopter escort, and armed reconnaissance of enemy troop positions. In later paragraphs, the RAD re-emphasized loiter and maneuverability characteristics, and in a new twist for tactical planes, directed that the design incorporate the ability to survive hits. It further specified that the aircraft carry not only pylons for bombs and rockets but also guns, that it be easily maintainable and cheap, and that its avionics be simple (though allowing potential modifications to conduct night/all-weather operations). Finally, the RAD asked that designers create a judicious balance between all of the requirements.<sup>17</sup>

The December 1966 RAD was only the first of many development directives in the A-10's life, but it set the tone for the ones that followed. It also showed the influence of the design team. The specific desired performance features reflected their attempt to make the fixed-wing plane compete as much as possible with Cheyenne while improving upon the A-1: short field capability (4000 feet), 8000 pound ordnance capacity (matched the A-1), an improved cruise speed over the A-1 (300 knots), a slow minimum maneuvering speed and corresponding tight turn radius like the A-1 (120 knots and 1000 feet), and a maximum gross weight which fell neatly between that of the A-1 and A-7 (22,500 pounds). Sprey recalled that the A-1 pilots were one of three influences upon his thinking in conceiving the A-X design (the other two being the legendary Stuka pilot Hans Rudel

<sup>&</sup>lt;sup>17</sup>MGEN Kenneth Dempster, USAF, Director of Operational Requirements & Development Plans, Headquarters Air Force, "Requirement for a Specialized Close Air Support Aircraft (A-X)," Requirements Action Directive RAD 7-69-(1), 22 December 1966, 1-6 (quote, 1), supporting documents (henceforth referred to as "Dempster, "RAD"). Mischler, "A-X," 20-24, discusses the RAD, and points out that it specified a tactical aircraft design which, for the first time in the Air Force's existence, lacked multi-mission capability.

and historical CAS performance). The A-1 pilots stressed that, like the A-1, the A-X must be rugged, maneuverable, and above all, they wanted to have loiter capability. This led to the RAD's desire that the A-X have two hours of loiter time. The staff wanted guns for the plane in order to counteract the Air Force trend to dispense with guns as obsolete weapons--Vietnam certainly proved their worth both in air support missions in the South as well as dogfights over the North (the proposed design also contained ample weapons stations for bombs and rockets). For survivability, the RAD stated that the A-X must be able to successfully sustain hits from 14.5 mm shells due to the historically proven high risk of ground fire damage in the CAS mission. (It also wanted the plane to survive hits from the shoulder-launched, heat-seeking SAMs just appearing on the scene.) Above all, they wanted a plane that exceeded the A-1's ruggedness, loiter time, ordnance capacity, simplicity, and maneuverability. This was so much the case that one AFRDQ staffer who later became Air Force Chief of Staff, Larry Welch, described the A-10 as a "jet-age A-1." It would also lead later critics to claim that the plane was too much a design for the Vietnam War. Yet, though the plane incorporated many lessons derived from Vietnam, the concept designers believed that they were producing a plane that could handle, as the Army intended for Cheyenne, a wider warfare spectrum of CAS.<sup>18</sup>

<sup>&</sup>lt;sup>18</sup>Dempster, "RAD," 1-6; GEN Larry Welch, USAF (ret.), personal interview by author, 2 May 1997, Alexandria, Va., tape recording and notes in author's possession; and the following interviews by author: Christie, Kay, Lancaster, Sprey. Mischler, 21-22, discusses survivability and how it related to the CAS mission. Pentland, "Evolution of A-10 Mission Requirements"; and Pentland, telephonic interviews by author, 19 and 22 February 1997, and 3 June 1997, notes in author's possession, reveal some of the belief that the plane's design concept favored limited wars like Korea. (Pentland was an A-10 pilot who worked CAS issues on the Air Force Headquarters staff in the late 1980s--during yet another battle between the service and its CAS plane.) Through the years, the plane would face many assertions that it was "designed for the last war." Christie knew Sprey at this time and called Sprey's A-1 contacts the "A-1 Mafia." Sprey said that the A-1 pilots' tactics manual was just a collection of mimeographed sheets, which to Sprey showed "how much hind tit these guys were getting; they couldn't even get a hard cover [from the Air Force] to put on a manual!"

Sprey answered the author's query about Marine Reserve COL J.H. Reinburg's possible influence upon A-X design by saying that he was aware of Reinburg's writings, but felt that Reinburg's proposed CAS plane was too heavily armored for its size and

In early 1967, Headquarters Air Force assigned the RAD to Systems Command, which commenced work upon the next big step in the development process, the Concept Formulation Package (CFP). Systems Command assigned supervision of A-X design work to its F-X project office. The F-X project, which would produce the F-15, commenced just before the A-X. It represented the service's response to the F-111's failure to meet air combat performance expectations, as well as American fighters' less than overwhelming success against North Vietnamese MiGs. Additionally, the Air Force's decision to procure the A-7, and then the A-X, gave impetus to fighter types who wanted a dedicated air superiority plane instead of a machine afflicted with serious design compromises in the name of multi-mission capability. The reasoning was that, if the service committed to buying dedicated attack planes lacking aerial combat prowess, then it would require the best air-to-air fighter available. The fighter men's desire mirrored that of attack plane advocates in that they were both tired of ineffective multimission planes; but the Air Force's priority for the two projects could be seen in Systems Command making the A-X a subset of F-X.<sup>19</sup>

<sup>19</sup>The creation of F-X and its relation to the F-111, A-7, and A-X can be found in Christie, interview by author (F-X was *the* priority project); Dörfer, <u>Arms Deal: The</u> <u>Selling of the F-16</u>, 4; Futrell, <u>Ideas</u>, vol. II, 470-474; Hasdorff. <u>Hildreth</u>, 61; Richard Head, "The Air Force A-7 Decision; The Politics of Close Air Support," 223-224; Mischler, "A-X," 24; Neufeld, <u>Boyd</u>, 27-29; Neufeld, "The F-15 Eagle," 11-27; Neufeld, <u>Sprey</u>, 20 (compares popularity of the two projects); Stevenson, <u>Pentagon Paradox</u>, 27-28 (F-111's failure as an air-to-air fighter); and Sweetman, <u>Modern Fighting Aircraft, A-10</u>, 7.

power. COL Reinburg was a World War II fighter ace, flew many CAS missions in Korea, and later wrote many articles advocating purchase of a simple, slow, maneuverable, and well-armored CAS plane. In these articles, he also gave brief primers on past American CAS performance as he saw it, and described the tactics that his ideal plane would use. See his "Close Air Support," <u>Army</u> 12 (April 1962): 59-63; "For Maximum Effort: LACAS [Low Altitude Close Air Support]," <u>Infantry</u> 53 (September-October 1963): 24-26; "The Flying Tank," <u>Infantry</u> 55 (May-June 1965): 66-67; and "Trials of Close Air Support Aircraft," <u>Army</u> 16 (March 1966): 67-68. The articles' timing and publication source are noteworthy, for they coincide with the Army's interest in procuring a CAS plane with capabilities similar to what he described. Interestingly, Sprey was the only source--written or oral--who specifically acknowledged Reinburg, though Reinburg's concept of an armored "tub" to protect the pilot was what appeared in the A-10.

Working together, Systems Command and Headquarters Air Force in April 1967 created two preliminary A-X designs: one powered by twin turboprops and one powered by twin turbofans. At that time, the Air Force preferred the turpoprop design because it provided good thrust for subsonic flight while at the same time maintaining fuel efficiency for good loiter. Turbofan technology was not sufficiently developed at this time, and the representative turbofan engine had both poor thrust and poor fuel efficiency.<sup>20</sup>

Both designs featured a large gun with one thousand rounds of ammunition, and the creative source for this weapon which would later so define the A-10 is an issue worth discussing. At least one government document and a number of book and journal sources claim the Israeli Air Force's success against Arab tanks in the June 1967 Six Day War

<sup>20</sup>Mischler, 25-31, 39; and Sweetman, 27-30 (good introductory discussion of turbofan evolution and its relation to the A-10). Additionally, during this time Systems Command solicited informal design ideas from four aerospace contractors: McDonnell-Douglas, Northrop Corporation, Grumman, and General Dynamics.

A simplified description follows of the major steps and documents of the Air Force airplane development process as they existed during the A-10's creation. The RAD was the first formal step and tasked the major Air Force command involved in A-X development, usually Systems Command, to further work the design concept embodied in the RAD. After study, Systems Command replied with a Concept Formulation Package (CFP), which Headquarters Air Force and OSD reviewed, and if they liked it, re-worked it into a Development Concept Paper (DCP) which they sent to the Secretary of Defense for approval (the DCP summarized the reasons for and details of the plane's creation). If the Secretary approved the DCP, OSD and the Air Force then wrote a Request for Proposal (RFP) which they sent to prospective contractors for bids. The A-10 was unprecedented in this particular phase, because the contract bid involved not only competing designs but an actual flyoff between the leading candidate planes. After approval, the winning design faced a series of milestone meetings conducted by a DSARC (named after the group set up to conduct them, the Defense Systems Acquisition Review Council), which determined progress and future action. Milestone I validated the concept, II approved full-scale engineering development, and III ordered full-scale production and employment. Each Milestone produced another DCP. As in the A-10's case, there can be sub-milestones to answer intervening questions. Good summaries of this process are in MAJ Roger Carleton, USAF, "The A-10 and Design-to-Cost: How Well Did It Work?" (Research study, U.S. Army Command and General Staff College, 1979), 12-14; and an address by BGEN F.M. Rogers, USAF, before the National Security Industrial Association, Dayton, OH, Chapter, 27 February 1969, supporting documents.

motivated the U.S. Air Force to fit a large gun on the A-X. However, other sources indicate the motivation lay elsewhere. The Doctrine, Concepts, and Objectives staffers and Pierre Sprey recall that the idea for a large, rapid-firing gun appeared early on. Specifically, Pierre Sprey approached Colonel Kay with intelligence information about increasing Soviet tank strength in Europe. As Kay and Sprey both later recalled, they needed to demonstrate the design's applicability to other CAS environments besides the guerrilla war in Vietnam, and incorporating a large caliber gun which could kill tanks was appropriate (they already envisioned including gun armament anyway). Influences upon Sprey included not only intelligence reports, but also the ideas of German aircraft engineer Hans Multhopp. The experiences of Stuka pilot Hans Rudel, who used a single-shot 37 mm cannon to destroy Soviet tanks in World War II, also inspired the designer. Sprey was impressed enough that he later said, "If you didn't have something that could effectively generate a probability of kill against a tank, it wasn't worth having an A-10." Perhaps most importantly, the staffers also needed an antiarmor weapon to match the Cheyenne's planned antiarmor capability, and Sprey directly stated that the "airplane stands or falls on this ... [or] we don't have a way of fending off Cheyenne." Finally, the Systems Command proposal appeared before the Six Day War, and postwar analysis of destroyed Arab armor revealed that the Israeli aviator claims were inflated.<sup>21</sup>

<sup>&</sup>lt;sup>21</sup>Sprey quote is from interview by author. The sources citing Israeli gun success as an influence are: "AF Concerned Over AX Opposition," <u>AFJ</u> 107 (11 October 1969): 14; Gunston, 259; OSD Director of Defense Research & Engineering's (DDR&E) Development Concept Paper (DCP) 23, "A-X Close Air Support Aircraft," 11 December 1968, 12; Smallwood, <u>Warthog</u>, 11-12 (says the Israeli success was "on the minds " of the A-X planners, and that the Israeli airmen killed tanks by hitting the weaker parts); Sweetman, 8; Joseph Volz, "A-X vs, AH-56: Competitive or Complementary?" <u>AFJ</u> 108 (25 April 1970): 26; and Warren Wetmore, "Israelis' Air Punch Major Factor in War," <u>AW&ST</u> 87 (3 July 1967): 21-23. In a later work, Brereton Greenhous also describes Israeli air success against tanks, but admits that some claims were inflated and that tank kills came via a variety of weapons, mostly rockets; see his "The Israeli Experience," in Cooling, ed., <u>Case Studies</u>, 503-509.

The above DDR&E source especially seems to validate the Israeli gun success claim, but the author believes A-X advocates included it in order to better sell the A-X concept. This was certainly the case with the above <u>AFJ</u> articles, which both discuss Air Force reaction to A-X criticism—and feature service spokesmen citing Israeli gun success as

By March 1968, a working group had taken the various design inputs and fashioned a Concept Formulation Package (CFP), which was to be sent to OSD for review and approval to commence the construction contract phase. Perhaps reflecting a Cheyenne-induced sense of urgency--the helicopter made its first flight in September 1967 and McNamara approved production of 375 more Cheyennes in January 1968--the working group's CFP directed an A-X initial operational capability (IOC, the staff term for the first plane built and delivered to an operational squadron) date of December 1970. This required "concurrency," a service term signifying the accomplishment of normally sequential steps in the aircraft creation process at the same time, thus risking major snarls if something went wrong. Concurrency had occurred before with various planes that the Air Force wanted badly, and their ensuing development proceeded badly too. But the service was confident that, since the A-X was a cheap and simple aircraft (and again, because of

a precedent for buying the A-X and its big gun. Also, Dr. Russel Stolfi, in a telephonic interview by author, 6-7 March 1997, notes in author's possession, further clarifies Israeli gun results. Dr. Stolfi was a Naval Postgraduate School history professor and tank warfare expert who personally inspected wrecked Arab armor at war's end as part of an American study. (Since the Arabs were routed, their damaged and destroyed tanks remained behind, in place, for examination.) The Aden 30 mm gun rounds that Israeli fighters used lacked the mass and velocity to lethally hit tanks, and Stolfi's inspection revealed that ground fire destroyed 97 percent of Arab tanks. (Stolfi will later figure in tests of the A-10's gun.) Smallwood, Warthog 11 (cites other factors besides Israeli success), and author interviews of Christie, Kay, Lancaster, and Sprey are sources for the other motivations for a large gun. (Christie worked A-X gun issues, and said the Israeli Aden gun experience actually motivated him and others to seek a more powerful gun for the A-X. The latter three also specifically dismissed the Israeli experience as an influence.) Neither Mischler's "A-X" monograph nor Malcolm Wall's Systems Command monograph history of the A-10 gun's development, "The Development and Acquisition of the GAU-8/A: The A-10's Tank Buster', 1966-1976," vol. I, (Wright-Patterson AFB, Ohio: Office of History, Air Force Systems Command, 1989), mention the specific motivation.

For the Army's anti-tank intentions for its Cheyenne, see COL Ronald Andreson, USA, and COL Ralph Powell, USA, <u>Conversation with Colonel Delbert Bristol</u>, Senior Officers Debriefing Program, (Carlisle Barracks, Pa.: AMHI, 1978), 64-76, transcript, History of Army Aviation Collection. Colonel Bristol was Director of Army Aviation on the Army's Pentagon staff, and also commanded the Army's Aviation Systems Command during this time, and told his interviewers that the Army wanted the Cheyenne to be able to destroy Soviet tanks in both day and night conditions.

the Cheyenne), the risk was justified. However, as Systems Command historian Robert Mischler observed in his monograph about A-X development, a delay that affected how the plane was created occurred at this time. In a process which Pierre Sprey called "bloodshed," Air Force Pentagon staffers modified the CFP to ensure certain aircraft characteristics. As a result, the final version did not appear until a critical two months later. The finalized CFP described A-X CAS the same as the RAD, but for the first time, the document specified four design guidelines that would shape A-10 construction: lethality, simplicity, survivability, and responsiveness.<sup>22</sup>

Lethality above all meant the service accepted its staff designers' argument that the A-X possess a large-caliber, rapid-firing gun to kill tanks. The finalized CFP specified a 30 mm gun with a six thousand rounds-per-minute rate-of-fire and a twelve hundred round magazine. Lest one think that the designers short-changed future CAS pilots with a fire rate six times what the magazine held, staffers at both Systems Command and the Pentagon conceived a reasonably accurate picture of employment parameters. The longest planned burst length per pass was approximately two seconds--enough to hurl about one hundred rounds at a target and ensure at least ten total passes. They wanted the round's constitution, velocity, and weight to amply guarantee that this burst length would kill a tank. As such, the tungsten-carbide constitution of traditional antitank rounds would not do; Rudel's experience against Soviet tanks demonstrated that. Rudel had to fire very close

<sup>&</sup>lt;sup>22</sup>Andrews, "Rugged Tests and a Rugged Machine," 16-17 (Army Cheyenne project details); Robert McNamara, Secretary of Defense, "Statement before the Senate Armed Services Committee on the Fiscal Year (FY) 1969-1973 Defense Program and 1969 Budget," 22 January 1968, reprinted in "Selected Statements by DoD and Other Administration Officials, January 1-June 30, 1968," (Washington, D.C.: Office of the Secretary of the Air Force Analysis Division, n.d.), 5 AFHRC Holding K168.04-48 (given his arrogance and faith in paper analysis studies, he said that this complex and innovative aircraft entailed "relatively small risk and ... favorable price"); Mischler, 37, 43-57; and Michael Wilson, "Fairchild A-10," <u>Flight International</u> 109 (20 March 1976): 708. Gunston substitutes *maneuverability* for responsiveness in his work (<u>Attack Aircraft</u>, 254), but the A-X project document, "A-X Close Air Support Aircraft," DCP 23, 4-5, uses *responsiveness*. Concurrency's pitfalls as they pertain to various Air Force aircraft are in Brown, <u>Flying Blind</u>, 20-26, 190-192, 334-337, 344-347; Coulam, <u>Illusions of Choice</u>, 203-215; and Gunston, <u>Early Supersonic Fighters of the West</u>, 172-174.

to a tank (six hundred feet) and only at a weak spot at the rear of its turret to destroy it. The staffers wanted a short firing range as well, but preferred four thousand feet to allow steep dive recovery, given the A-X's higher speeds (as compared to a Stuka or an A-1). Through research they discovered depleted uranium, which had the appropriate heavy density combined with the ability to ignite like magnesium upon high velocity impact. Finally, the CFP expanded the number of pylons for bomb/rocket carriage to ten—and the ordnance capacity to over sixteen thousand pounds—though Sprey later said that he should have insisted that the plane use only the gun. The McNamara Whiz Kid emphasis upon maximizing tons of ordnance carried per mile travelled drove the decision, but he felt that hanging pylons on the plane to carry extra ordnance meant a wing redesign and corresponding reduction in performance.<sup>23</sup>

Depleted uranium ensured penetration of armor, but Sprey remembered that there was, and would be, "bloodletting" over this and other gun specifications. Designers looked at a 25 mm gun, but its shells lacked the appropriate mass. They considered a 35 mm gun,

<sup>&</sup>lt;sup>23</sup>Mischler, 51-54 (mentions that contractor study findings also supported the idea of a large internal gun); Pentland, "Evolution," (Cited the gun dive delivery requirement as an example of the designers' limited war orientation-dive deliveries meant that ground defenses were weak enough to allow higher attack altitudes) Reeves, "AH-56 vs. the A-X," 27 (puts the A-X load carrying capacity in perspective by describing possible weapons load combinations, such as eighteen 500-pound bombs or eighteen launcher pods carrying nineteen 2.75-inch rockets each, which is a lot of ordnance; but which still does not exceed the 18,000-pound total carriage capacity); and Christie Sprey, and Welch, interviews by author, who all discussed the reasoning involved in the gun concept. Wall, "GAU8/A," iv-v., 1-6, also mentions that originally the Air Force intended for the gun to fit onto the A-7, A-37, F-4, and F-105, among others. Wall describes the various gun options and reasons for rejecting them in favor of the 30 mm Gatling gun, and also mentions that requirements specified that the gun be effective against Soviet JS-III heavy tanks, T-54 medium tanks, and PT-76 light tanks with a Pk of 50 percent. (Pk signifies percentage chance of catastrophic kill; that is, complete destruction of item and its ability to move and shoot.) Wall's account describes the decision-making as occurring under the auspices of a Study Group set up with Systems Command's Armament Laboratory (ATL) and Eglin Armaments Laboratory people. Christie, who had already met and worked with Pierre Sprey in the Pentagon, also worked in OSD's Joint Technical Coordinating Group (JTCG), and as such, had some oversight authority over the project. It is in this way that Christie and Sprey were involved in early gun design.

but its size induced too many performance penalties. And they studied using a recoilless rifle, but its accuracy and muzzle velocity were poor. Systems Command's Gun and Rocket Division at its Eglin Air Force Base, Florida, Armaments Laboratory objected to the staff designers' 30 mm proposal and suggested modifying the standard 20 mm gun used in Air Force fighters. This weapon utterly lacked the ability to pierce tank armor. Eglin did not like using depleted uranium, though studies proved that as *depleted* uranium, it had no unsafe radioactive properties. The Army's Ballistics Research Laboratory at Aberdeen Proving Ground, Maryland, revealed the growing friction between the A-X and Cheyenne projects by challenging the proposed 30 mm gun's effectiveness. Though one of the Air Force Armament Laboratory directors remembered some of these details differently, this was the first of several clashes between aggressive CAS plane advocates and the respective Air Force and Army gun laboratories.<sup>24</sup>

These men and the other interview sources commented upon the strained relationship between the Aberdeen BRL and Eglin Armaments Lab on the one hand and, apparently, any outsiders on the other. Some sources were vehement about the lab's incompetence based upon serious frustrations in dealing with it. COL Dilger, who later figures in the A-10's gun history, believed that the Armaments Lab lived in a research ivory tower, and that the BRL sometimes placed Army interests above research truth. Sprey asserted that both labs were simply incompetent, and that the Armaments Lab consisted of BRL castoffs from the time when the Air Force separated from the Army. Burton's Pentagon Wars backs these two men, in that it is partially an account of the author's struggles with the BRL as its research chose Army image and budget priorities over operational efficiency and survivability. Christie was more measured, but observed that the Armaments Lab had mixed-up priorities and that its members were indeed former BRL types who were too hidebound. COL Kishline, who supervised Dilger and worked with Christie on A-10 gun issues, reminded the author that Eglin's charter was to explore technology, and thus there would be differences between it and operationally oriented agencies (though Kishline fought the lab as well). LTGEN McMullen, who was Director of the A-10 Project Office in the early 1970s and later commanded the Tactical Air Warfare Center (TAWC) at Eglin, observed that Eglin was a bit too casual and had a

<sup>&</sup>lt;sup>24</sup>Robert Buchta, telephonic interview by author, 12 August 1997, notes in author's possession; COL Robert Dilger, USAF (ret.), 26 February 1997, notes in author's possession; COL Sam Kishline, USAF (ret.), 13 April 1997, tape recording and notes in author's possession; Richard Oates, 9 July 1997, notes in author's possession; and author personal interviews with LTGEN Thomas McMullen, USAF (ret.), 5 May 1997, Alexandria, Va., recording and notes in author's possession; and the following previously cited interviews by author: Christie and Sprey.

In keeping with the A-1's relatively simple construction, as well as the desire to undercut the Cheyenne's cost, the Air Force made sure that the A-X did not carry an abundance of avionics goodies that escalated costs on other planes. It would not have an all-weather radar like the F-111, or sophisticated inertial fire control system like the A-7. Nor did it carry even a fraction of the gear the Cheyenne was supposed to have. Instead, it carried sufficient radios to talk to ground troops, a basic optical sight for weapons delivery, and a laser spot tracker (for laser designation of CAS targets by ground troops or FAC). The staff did allow for inclusion of cockpit instruments to accommodate either the television-guided Maverick missile then under development or Forward Looking InFrared (FLIR) night vision apparatus. In all, the CFP projected a per-aircraft cost of just over one million dollars, which was well short of the Cheyenne's looming estimate of six million dollars per copy.<sup>25</sup>

<sup>25</sup>Mischler, 49-5, 55-57; and the following interviews by author: Christie, Sprey, and Welch.

history of weapons development problems. Oates and Buchta, both of whom were project managers within the A-10 gun program, conceded that problems existed between the lab and even other Systems Command agencies, and this was due to the personalities involved as well as Eglin's separate charter and ample research budget. One individual cited by Christie and Sprey as a "personality" was the Director of the Gun and Rockets Division of the Armaments Laboratory, Dale Davis. Davis' recollection of why his division made the modified 20 mm counter-offer differs from Sprey's; it was an answer to an Air Force Pentagon query about what his lab could quickly develop to meet a six months' deadline supporting the early IOC. When given more time, his shop developed something better; see Jack Neufeld and Ralph Rowley, Interview of Mr. Dale Davis, (Washington, D.C.: USAF Oral History Program, 22 May 1973), 4-6, transcript, AFHRC Holding K239.0512-963.

The design's de-emphasis of advanced technology pleased Sprey, who told the author that "The only thing that counts is effectiveness. To have the latest technology is irrelevant . . . we're not in this to field technology. We're in this to make weapons that keep our people alive and help them to win." In an earlier interview, he sarcastically observed that the Air Force's low budget priority ensured a practical A-X design: "So the A-X came out close to being as austere as it was simply by fluke because it was an unpopular program. If TAC headquarters had wanted an A-X, I guarantee you that the damn thing would have rivaled the B-58 for complexity today"; see Neufeld, <u>Sprey</u>, 19. Sprey's comparison to the B-58 is apt, for it represented an ambitious Air Force attempt to field a supersonic jet bomber in the 1950s, and it encountered many problems due to

The survivability features were extensive and unprecedented. The CFP reflected the service's recently commenced-and effective-use of systems analysis in studying aircraft battle damage, as well as a genuine concern about the lethality of the CAS environment. Analysis revealed that 80 percent of aircraft combat losses occurred due to fire and loss of control. Accordingly, the CFP demanded that the A-X have flame-retardant foam in its self-sealing fuel tanks, that its armor-protected engines be well separated from the fuel tanks and each other, and that the gun magazine have blow-out doors. Also, studies of aircraft losses in Vietnam unearthed problems peculiar to modern jets. Tactical jet designers in the 1950s erred in setting up the hydraulic systems required to power a jet's flight controls by placing their lines in vulnerable spots, or next to engine hot sections (where a leak could cause the flammable hydraulic fluid to ignite), or providing no back-up system in case of total failure. A major source of F-105 losses, for example, was small arms fire hitting its vulnerable components. Thus the A-X would have protected hydraulic lines, dual flight controls, control jamming protection features, and a manual flight control system. There would even be a "bathtub" of heavy armor that would protect the cockpit from small arms fire. The designers also preferred maneuverability to overall speed because maneuvering helped defeat antiaircraft tracking solutions, whereas flying fast on a straight, predictable course did not (and because the staff designers insisted upon maneuverability over speed, TAC refused to participate in the concept formulation phase). Analysis did not drive every survivability feature, however. Designers wanted a

unforeseen consequences in its revolutionary, complex design; see Brown, <u>Flying Blind</u>, 172-192; and Bill Gunston, "General Dynamics B-58 Hustler," chap. in his <u>Bombers of the West</u> (New York: Charles Scribner's Sons, 1973), 185-199.

Author Bradin writes that by 1967, the Cheyenne's rising cost and complexity presented problems; see his <u>Hot Air to Hellfire</u>, 117. See also Reeves, "Close Air Support, AH-56 vs. A-X," 45-48. This 1972 Air Command and Staff College work is a good general summary of interservice relations as they pertained to the Cheyenne and A-X, marred by Reeves' insistence that the Cheyenne was a successor to the Cobra (13); this simply does not square with other, Army-oriented, sources. However, Reeves dwells upon the Cheyenne's cost compared to other Army helicopters, concludes that it violates the Army's original bent for mass producing inexpensive aircraft such as the UH-1 and AH-1, and recommends that this complex and expensive advanced helicopter *be transferred to the Air Force* where it can work as a team with the A-X.

twin-engine plane even though studies did not conclusively prove that they made a plane more survivable. In all, Sprey made a very important point about the intentions behind these features: "Bar none, this is the most survivable plane ever built for the close air support mission. [But we] didn't make it survivable over Moscow or attacking air bases." Later Air Force leaders denigrated the A-10 for not being able to operate in a high-threat interdiction environment--but the designers never intended that it fly that type of mission.<sup>26</sup>

<sup>&</sup>lt;sup>26</sup>Quote is from Sprey, interview by author. Armament Systems Division (ASD), Headquarters U.S. Air Force, Information Office, "News Release," 18 May 1970, 1, supporting documents; Congress, Senate, Hearings Before the Committee on Appropriations, <u>Department of Defense Appropriations, Part 4</u>, 91st Cong., 2d sess., 4 May 1970, 41 (Seamans claims that the A-X is the first plane built with survivability features in mind); Gunston, <u>Attack Aircraft</u>, 256-257; LTCOL Robert McDermott, "Engineering for Survivability," <u>USAF Fighter Weapons Review</u> (Fall 1978): 13-14 (McDermott put the statistics, derived from both Vietnam and the Six Day War, at 62 percent due to fire/explosions, 18 percent due to pilot incapacitation, and 20 percent due to loss of control, which fits the survivability emphasis placed in the A-X design); Mischler, 54-55; Sweetman, <u>A-10</u>, 7 (preference for two engines), 16 (the A-10 "set standards" for survivability), 24-25 ; Franklin C. "Chuck" Spinney, personal interview by author, 7 May 1997, Washington, D.C., tape recording and notes in author's possession; and the following interviews by author: Christie, Fredericksen, and Sprey.

Sprey said that in spite of the conventional wisdom justification for two engines, analysis revealed that this setup often meant greater size, extra weight, performance degradation, greater complexity (read tougher maintainability), and greater cost. The DDR&E chief at the time of the A-X's development, Dr. John Foster, made similar points; Dr. John Foster, telephonic interview by author, 19 December 1997, notes in author's possession. This author believes that two engines are compelling to American air leaders because an engine loss in peacetime flying does not automatically mean aircraft loss, and American leaders in general do a lot to prevent unnecessary losses in war. An assigned reading in the U.S. Air Force Air War College Associate Programs, Military Studies Course (MS 612AP), Volume II, 4th edition, Lessons 17-18, (MAFB: Air University, 1993) confirms these views, at least as they pertain to fighters like the twin-engine F-4, F-14, and F-15; see William Gregory, "Uncertainty: Technical and Financial," 46-54, reprinted chap. in his The Defense Procurement Mess (New York: MacMillan, 1989), 129-153 (page numbers are from the Air University text). Further, in a later discussion of the relative merits of the A-10 versus the A-7, Congressman Otis Pike and Air Force Deputy Chief of Staff for Research and Development, LTGEN Otto Glasser, cite the A-10's two engines as an advantage over the A-7's single engine setup; see Congress, House, Committee on Armed Services, Hearings on Cost Escalation in Defense Procurement Contracts and Military Posture and H.R. 6722, 93d Cong., 1st sess., 21 May 1973, 1336.

Pierre Sprey recalled that the A-1 Vietnam veteran pilots wanted loiter capability, and one reason was that it determined responsiveness more than aircraft speed:

The other thing these guys taught me, just banged it home, because it didn't make sense to me at first, was the overwhelming importance of loiter time . . . that if you want very fast time response . . . . you can't get it with speed, because you're always too far away. If you're on the ground it's too late . . . you can have an airplane go Mach 3 and it's still too late. The only way to get super quick response time is to be in the air, loitering, and checked in with a FAC . . . you need three to five minutes response time . . . come any later and you might as well not have come.

The staff designers believed that responsiveness depended not only upon loiter capability but also upon maneuverability and the ability to fly from short, austere fields. A maneuverable plane could quickly turn to reattack a target, and short field capability helped the plane compete with the Cheyenne. The latter item was because the A-X would have more basing flexibility than other Air Force tactical planes, and thus allow the Air Force better to demonstrate its CAS commitment by placing A-X units close to the troops they supported. These requirements would create a future problem in that such a plane needed a thicker wing to carry all of its planned ordnance *and* allow *both* STOL performance as well as fuel efficiency for slow-speed loiter. This type of wing produced a lot of drag that prevented faster speeds regardless of the powerplant's strength. Finally, in reaction to a problem that had kept airmen from precisely meeting ground units' needs in at least two

Spinney achieved some fame as a Pentagon defense reformer openly challenging his bosses' management of President Ronald Reagan's military buildup; see Walter Isaacson, "The Winds of Reform," <u>Time</u>, 7 March 1983, 12-30. (Spinney is on the cover.) He began his Air Force and Pentagon career doing aircraft battle damage analysis. Both Spinney and Sprey told the author that the A-7 had poor survivability features. Its engine and fuel tanks fit snug together, hydraulic lines ran through vulnerable spots, one specific hydraulic systems failure combination rendered it unflyable, and no manual backup control system existed if all hydraulics failed. Sprey called it a "hopeless candidate for close air support," and both Spinney and Sprey said that combat damage analysis statistics supported this claim.

wars, the designers specified that the plane would carry the appropriate Army-compatible communications gear.<sup>27</sup>

The later CFP completion date--as well as some of its details, such as having to invent a new gun and fit it into the plane--led the service to slip the A-X IOC to 1972. Another reason possibly was that stories of the Cheyennne's developmental problems started to become public, which relaxed the pressure to build a plane to compete with it. Thus, the initial rush to produce the plane subsided, which allowed more deliberate consideration of its design. It was just as well, for the modified CFP that the service sent to OSD for review and approval snagged upon some of these extra considerations.<sup>28</sup>

Dr. John Foster's DDR&E office was responsible for crafting the ensuing Development Concept Paper (DCP) that would be sent to the Defense Secretary for review and approval for further action. As Foster later told the author, DDR&E's questions about the new design were mostly routine, analysis-type questions that ensured that OSD addressed all pertinent issues. These were: would a current aircraft meet the requirements; and should concurrent development occur on a more complex A-X that could do night and all-weather CAS? One other question reflected a procurement philosophy change overtaking OSD and the Air Force with Robert McNamara's March 1968 departure: should competitive prototypes be developed and flown before selecting a particular design? Due to his faith in the power of systems analysis to answer any problem, McNamara favored using paper and computer studies to choose from among competing designs. However, the controversy and problems surrounding his headlong push to build the F-111 left many people cold. Both Foster and the Systems Command commander,

<sup>&</sup>lt;sup>27</sup>Gunston, <u>Attack Aircraft</u>, 254-256; Mischler, 44; and Sprey, interview by author. Sprey's quote contradicts the thrust of John Sbrega's comparison of A-1 and jet fighter performance in his "Southeast Asia," essay in Cooling's <u>Case Studies</u>, 441, 444. Sbrega favored speed as the determinant of responsiveness.

<sup>&</sup>lt;sup>28</sup>Mischler, 43; and two 1968 Walter Andrews articles on the Cheyenne project reveal increasing suspicions about its health; see "The 'Known Unknowns' and the 'Unknown Unknowns,'" and "There Are No Red Flags Flying," <u>AFJ</u> 106 (14 December 1968): 14-15, and 20-24.

General James Ferguson, were interested in competitive prototyping. Foster made it an actual procurement issue by incorporating it as a design question.<sup>29</sup>

The questions produced varying alternative answers. The Air Force insisted that no other aircraft could match A-X's programmed CAS strengths, and that it should proceed with due haste to field this plane no later than 1973. However, Foster had a number of concerns about the design concept, and in DCP 23, submitted to OSD in December 1968, recommended deferment of approval for contract proposals. Foster felt that the design's specified survivability against small arms fire (14.5 mm) was insufficient given the heavier automatic weapons, such as 23 mm, available to most Warsaw Pact ground units. Additionally, he wanted to see if anything from the development of the A-7, OV-10, and A-37 could be transferred to the A-X (the A-37 was a counterinsurgency attack version of the Air Force's small T-37 trainer; for photos of the A-37 and OV-10, see Appendix Figs. 19 and 33). Finally, Foster was suspicious of the CFP's expanding the A-X's size and weight. He did not want a repeat of the F-111 experience, when the service wanted to add too much capability to the plane and nearly produced a monstrous failure. Also, it seemed to Foster that the planned size, range and payload specifications probably would produce a plane no different than the A-7. Foster wanted an A-X, but truly wanted to keep it simple and survivable.<sup>30</sup>

<sup>30</sup>DDR&E, DCP 23; Mischler, 57-61, 64; Wilson, "Fairchild A-10," 707; and the following interviews by author: Foster and Sprey. DCP 23 reiterated the RAD's and CFP's definitions of the type of CAS the A-X would fly. It specified the A-7, OV-10, and A-37 deficiencies that necessitated A-X development: A-7, excessive runway requirements, marginal survivability, poor maneuverability; OV-10, a FAC/observation plane and not an attack plane; A-37, limited loiter, poor combat radius, reduced weapons carriage, and little protective armor. DCP 23 also discussed the Air Force's preference--to date--for a turboprop plane. It addressed A-X use of smart weapons such as the Maverick missile, as well as the plane's possible operation in night and all-weather scenarios. The document emphasized the design's cost-effectiveness, proposed further studies on how the A-X compared to the Cheyenne, and recommended prototype testing as a means of reducing developmental risk. A later defense journal article also enumerated the other attack planes' deficiencies; see Wilson, "Fairchild A-10," 707.

Pierre Sprey believed that Foster delayed the A-X program because he was

<sup>&</sup>lt;sup>29</sup>DDR&E, "A-X Close Air Support Aircraft," DCP 23; Mischler, 57-59

OSD reviewed DCP 23 and approved money in the Fiscal Year 1970 budget for contract definition, contingent on the Air Force reviewing Foster's concerns. Through early 1969, the service examined them and made some small reduction in size and gross weight. The Air Force seemed anxious to press on with a Request for Proposal (RFP) to aviation contractors. Indeed, in September 1969, it requested a Defense System Acquisition Review Council (DSARC) to review its new CFP and start contract definition. One possible reason was that outside factors--the Cheyenne's fate, an irritated Congress, and a new presidential administration--increasingly dominated A-X development.<sup>31</sup>

## Other Factors and A-X Development

However, before moving forward, OSD wanted more opinions of A-X. Most important was the Army's attitude, since that service would be the prime beneficiary of this plane's creation. But the undercurrent of friction between the services made one wonder how the Army would answer, and how the Air Force would in turn react. The two services' actions throughout this period of CAS plane gestation were not encouraging. A 1967 Army study revealed that its commanders in Vietnam liked the Air Force CAS that they received, but they preferred aircraft that could guarantee quick response and find the target. The latter finding implied that the ground commanders wanted armed helicopters. Thus, through 1968, the Air Force conducted comparative studies that described the A-X as a more cost-effective aircraft than the Cheyenne. Wanting a hopefully unbiased source of information, OSD, in conjunction with Foster's DCP 23, directed its Weapons System Evaluation Group (WSEG) to conduct a comparative evaluation to explore WSEG's ability to resolve uncertainty between competing aircraft (a first for WSEG, which was established in 1948 as part of the Key West Agreement). WSEG's February 1969

enamored of high-technology weapons and thus did not like the A-X. Foster insisted to this author that the reason was quite the contrary. Foster wanted the Air Force to produce a CAS plane, but he was tired of overambitious airplane projects and feared too much ambition for the A-X. A later DDR&E DCP, DCP 23a, 16 March 1970, seems to bear this out; see excerpt in Mischler, 71.

<sup>&</sup>lt;sup>31</sup>Mischler, 61-62, 66, 82-83.

findings featured a caution that they should not be used to pick one aircraft. In this, the study previewed the inconclusive nature of early-1970s CAS study conclusions.<sup>32</sup>

Indeed, any conclusion would be based upon the shifting sands of varying definitions and impressions of CAS, as well as the various players' immediate and perceived future needs. A later analysis of Vietnam CAS, for example, found that only 10 percent of the many missions flown in South Vietnam that either the tasking authority or pilots called "CAS" actually involved troops in contact with enemy forces. Furthermore, just after the Vietnam War ended, an Army Command and General Staff College study conducted a survey that revealed confusion over air support procedures and definitions between and among both services' veteran officers.<sup>33</sup>

Though the Army definitely wanted air support, it not only subtly redefined it to secure the Cheyenne's continued existence, but also backed away from demanding an input in Air Force tactical airplane development. Hoping to avoid a head-on turf clash with the Air Force, Army leaders continued to brandish the term "direct fire support" to describe helicopter CAS. And when Defense Secretary Clark Clifford asked the Army its opinion of the A-X concept, that service's Combat Developments Command (CDC) responded by openly acknowledging that the A-X and the Cheyenne competed for the same mission's defense funds. CDC's commander, Army helicopter proponent Lieutenant General Harry Kinnard, wondered if the A-X was a plane designed too much for Vietnam instead of other war environments. As such, he believed that the A-X's design and

<sup>&</sup>lt;sup>32</sup>J. N. Bradshaw, "Close Air Support (CAS)," CFP Supplement (Chronology and Summary Sheets), 25 April 1969, 1.2-2.5, supporting documents; and DDR&E, DCP 23, 13; Reeves, "AH-56 vs. A-X," 13; and Wolf, <u>Basic Documents on Roles and Missions</u>, 180. According to Wolf, the Key West Agreement created WSEG in order to prevent bitter inter-service turf fights such as the one then (1948) brewing between the Air Force and Navy over strategic bombers, aircraft carriers, and nuclear weapons.

<sup>&</sup>lt;sup>33</sup>BDM Corporation, <u>A Study of Statistical Lessons Learned in Vietnam</u>, vol. VI, BDM/W-78-128-TR-VOL-6-1, <u>Conduct of the War</u>, 9 May 1980, 18-19, AMHI Library; and MAJ H. G. Nophsker, USAF, "Perceptions of Fighter Strikes: An Investigation into Army and Air Force Officers' Concepts of Close Air Support, Air Interdiction, and Tactical Air Control" (Master's thesis, U.S. Army Command and General Staff College, 1976), 14-40, 80-89.

single-mission intent added little additional air capability for the financial and force structure sacrifice to accommodate it. He preferred that the Air Force be allowed to choose tactical aircraft based upon its traditional doctrinal preference for air superiority. To Kinnard, this tack represented more effective Air Force air support of the Army. Thus, his Cheyenne-driven attitude fulfilled General Ridgway's 1956 warning about the Army's intention to go its own way if the Air Force did not build a CAS plane.<sup>34</sup>

Kinnard's attitude also reflected the fact that the Army was nervous about a rival aircraft, because the Cheyenne project was in trouble. Cost overruns beset the project to the point where one aircraft cost twice as much as the Air Force's F-5 jet fighter (and as Army aviation historian Frederic Bergerson pointed out, it would have cost the same as the sophisticated F-16 fighter that the Air Force bought in the 1970s). Additionally, the design encountered problems with its innovative rotor technology; so much so, that one Cheyenne's main rotor smashed into its canopy during a 1968 test flight. In February 1969, a Cheyenne crashed and killed its pilot during flight tests, and in April, the Army sent Lockheed an ultimatum to write a plan for curing the program's ills. When Lockheed failed to meet the Army's demands, that service cancelled the Cheyenne contract. But since the Army very much wanted an advanced attack helicopter, it later renegotiated a research and development contract with Lockheed for a Cheyenne with an improved rotor system. And given that the rotor was important to the whole design, this meant that the Army and Lockheed resumed the program almost from scratch. Later Army leader and

<sup>&</sup>lt;sup>34</sup>COL James T. Avery, U.S. Army Combat Developments Command, "AH-56 Outline Plan of Test," letter of transmittal, Fort Rucker Papers, 27 June 1968 File, (Carlisle Barracks, Pa.: U.S. Army Military History Institute, 24 October 1968), para. 2b. (COL Avery specifies that the Army will not run comparison tests between Cheyenne and Air Force planes because it does not see the aircraft and their missions as comparable.) Davis, <u>The 31 Initiatives</u>, 21; Kirkpatrick, "The Army and the A-10," 27-30 (extensive discussion of and quotes from CDC study and Kinnard); and Sbrega, "Southeast Asia," in Cooling, ed., <u>Case Studies</u>, 454-455. Kinnard reiterated his position in an article of the time; see Walter Andrews, "A Weapons Ship for All Environments," 12-13. This article, Kinnard's CDC study, and another article in the same <u>AFJ</u> issue, Hessman's "New Weapon System," 7-10 (and even Reeves in "AH-56 vs. A-X," 18), confirm that one of the Cheyenne's planned strong suits was its anti-armor capability, which reinforces Sprey's point to the author that the A-X needed an anti-armor gun as a way of "fending off" the Cheyenne.
Army aviation historian recollections of the aircraft described an overly ambitious program that failed due to misunderstandings between, and errors by, the Army and Lockheed. Army aviation historian Bergerson and aviation leader Hamilton Howze both criticized that service for departing from its simple, inexpensive aircraft preference in favor of an aircraft which represented more the Air Force's penchant for expensive and complex machinery. The Army leadership further contributed to the problem by insisting that Lockheed help recoup the Army Material Command's research investment on an unworkable gun by installing it on the Cheyenne. For its part, Lockheed had never built a military helicopter before, and the Cheyenne was far too ambitious for a first attempt. Finally, the company found itself receiving congressional criticism about its C-5 transport plane, and channeled most of its attention to that program.<sup>35</sup>

GEN Williams told the author that the Cheyenne was an "engineer's dream." He said that a harmonics problem in the main rotor caused the fatal crash, and that the ensuing need for extensive rework caused the initial contract cancellation. He told both the author

<sup>&</sup>lt;sup>35</sup>Bergerson, 122 (source of cost comparisons); and Bradin, 117, 123-124, 142-143 (writes that when the Army revisited advanced attack helicopter development in the 1970s, the Cheyenne legacy was so bitter that it hindered acceptance of any contract engineer formerly associated with Lockheed); and the following interviews by author: Bahnsen and Williams. See also the following Carlisle Barracks, Pa., U.S. Army Military History Institute, Senior Officers' Debriefing Program, History of Army Aviation Box items: LTCOL Ronald Andreson, USA, and COL Bryce Kramer, USA, <u>BGEN O, Glen Goodland, USA (ret.)</u>, 9 May 1978, 1-2, 7, transcript, tape 2, side; LTCOL Philip Court, USA, and COL Ralph Powell, USA, <u>GEN Robert Williams, USA (ret.)</u>, 1978, 21-22, transcript, side 1, tape 3; COL Bryce Kramer, USA, and COL Ralph Powell, USA, <u>GEN Edwin Powell, USA (ret.)</u>, 18 March 1978, 26-27, transcript, tape 2, side 1; and LTCOL Robert Reed, USA, <u>GEN Hamilton Howze, USA (ret.)</u>, 14 October 1972, 58-59, transcript.

The 14 December 1968 edition of <u>Armed Forces Journal</u> focused upon the Cheyenne and revealed some of its problems. Previously cited articles from this edition are Walter Andrews, "No Red Flags Flying," "Known Unknowns," "Rugged Tests," and "Weapons Ship for All Environments"; and James Hessman, "The Army Gets a New Weapons System." Also, there is Hessman's "Into the Inventory," 11. A later <u>AFJ</u> article, Volz' "AX vs AH-56," 25, states that the problems cited in the Army's cure notice to Lockheed were rotor instability, inadequate directional control in hovering flight, and excessive coupling during maneuvering flight (coupling means that when the pilot commands a roll about the longitudinal axis, the aircraft tries to roll about the lateral axis as well, producing tumbling flight if the coupling becomes bad enough).

The C-5's problems were but one of the military aircraft issues that upset Congress at this time. America's disillusionment with the Vietnam War and the military was one reason for a chilly reversal from earlier acceptance of the Pentagon's aviation needs. Another was that aircraft costs skyrocketed due not only to the inflation gripping the country's economy, but also to ever more high-performance and complex machinery. A congressional report written about military aircraft costs complained that: "It is striking ... that fighter aircraft now being developed for procurement in the mid 1970s will cost more than five or six times more than comparable aircraft at the beginning of the 1960s." Though the report appeared in the early 1970s, it described aircraft such as the A-X which were conceived in the late 1960s-when all of the services wanted new aircraft in order to remain superior to Russian planes. Thus the CAS aircraft argument appeared at a bad time, and the Senate Armed Services Committee in 1968 questioned the A-X requirement when the military already had A-4, A-6, and A-7 attack planes. An ominous sign of Congress' temper came in summer 1969, after Senate hearings where the Air Force inadequately demonstrated the A-7's specific purpose versus other planes--and also failed to show how it would prevent further A-7 development cost overruns. For this, the lawmakers cancelled A-7 funding. (It restored funds after the Air Force submitted a reclama showing corrective action.) Congress then trained its angry eyes on the A-X. In September 1969, the House Armed Services Committee held up funding for A-X because some members did not feel that a turboprop design represented enough of a technological advance to warrant support. After all, the Air Force seemed to have plenty of low-technology planes such as the A-37, OV-10, and gunships to provide air support. Others, such as antiwar liberals in the Democratic Study Group, thought the plane

and Army interviewers that the C-5's problems diverted Lockheed's attention and engineers away from the Cheyenne, especially when the Cheyenne was in danger of cancellation. Goodland was an Army aviation advocate who felt that the Army not only erred in choosing Lockheed, a company with no helicopter experience, but also in choosing the treacherous path of high-technology weapons procurement. Howze's comments agreed with Goodland, in that he felt that the Army needed helicopter quantity more than advanced technology. Powell thought the design was poor and that the program skipped critical steps, such as wind tunnel testing, which might have prevented the fatal crash.

represented a Defense Department promotion of limited wars like the increasingly unpopular one in Vietnam.<sup>36</sup>

<sup>36</sup>An excellent summary of why aircraft costs escalated is in Assistant Air Force Secretary for Research and Development, Grant Hansen's testimony in Congress, Senate, Hearings before the Committee on Appropriations, Department of Defense Appropriations, Fiscal Year 1973, Part 4, 92d Cong., 2d sess., 21 February 1972, 691-695. Other sources for this paragraph are: "AF Concerned Over AX Opposition," AFJ, 14 (source of House opposition for technological reasons; also points out that Otis Pike tried to get fellow members to support the A-X project, but to no avail): Bright, "Costs: Into the Stratosphere," chap. in his The Jet Makers, 149-167; MAJ Barnes, "Concept," 21-22, 36 (good description of jet complexity as it pertains to costs, and also details costs); DCP 23, 14 (source of 1968 congressional A-X opposition); Fallows, National Defense, 36-37 (discusses the rapid rise of fighter costs); Head, "A-7," 416, 463, 476-520; Eric Ludvigsen, "Up From the Ground or Down From the Sky," Army (July 1971): 49; and "Stopping the Incredible Rise in Weapons Costs," Business Week (19 February 1972): 60-61 (source of congressional quote and report about rising defense costs); Volz, "AX vs. AH-56," 25-26 (source of liberal Democrat opposition). When outlining the A-T's later developmental travails. Head cites and includes excerpts from Congress, Senate, Committee on Armed Services, Authorization for Military Procurement, Research and Development, Fiscal Year 1970, 91st Cong., 1st sess.; and Congress, Senate, Report #91-290, 3 July 1969. See also Bright, Jet Makers, 70-73, for discussion of how McNamara's bent for paper studies contributed to cost inflation. Though McNamara thought such studies saved money, they did not account for the many uncertainties and modifications that a design faced during development; hence, cost fiascoes in the C-5, F-14, and F-111 programs.

As early as 1968, former Air Force Secretary and current Senator Stuart Symington (D-MO) warned Air Force leaders about how they handled selling low-technology aircraft purchases to Congress. Symington favored the traditional Air Force bent toward fast, complex planes, and apparently did not like the service's trend toward obtaining the subsonic attack planes. After sarcastically remarking to GEN McConnell that "The way things are going, pretty soon we may have a recommendation for a plane that flies backward," he told GEN Disosway that a simple plane "just does not interest the civilians currently making the decisions." See Congress, Senate, Hearings before the Preparedness Investigating Subcommittee of the Committee on Armed Services, <u>U.S. Tactical Air Power Program</u>, 90th Cong., 2d sess., 28 May 1968, 92-96 (first quote, 95), 112-116 (second quote, 114).

The author notes the irony of lawmakers who lambast high weapons costs but want the best weapons. Even with many congressmen drawing the line on military spending in the early 1970s, others still wanted the best for American troops. In 1972, F. Edward Hebert (D-LA), chairman of the House Armed Services Committee, stated, "In war they don't pay off for second place . . . . I intend to build the strongest military we can get. Money's no question" (See Bright, <u>The Jet Makers</u>, 153). Hebert's later ouster from the

Congressional pressure galvanized all of the OSD and military players involved with A-X and Cheyenne development. It spurred the Air Force to take a stand for the A-X when the Cheyenne's threatened demise might have led the service to abandon it. Articles touting Air Force support for the plane appeared in various defense-related journals. In an Armed Forces Journal article that discussed the House cut, Air Force officials downplayed favorable reports about the OV-10's CAS potential by saying (correctly) that it lacked the ruggedness and lethality of the A-X. Some months later, in another Armed Forces Journal article, Air Force leaders reminded congressional skeptics that the A-X was the successor of the popular A-1. Both articles also appealed to the alleged Israeli Six Day War fighter success against Arab tanks to prove that the A-X's big gun made it a valuable CAS asset in war environments where tanks were a factor. The Air Force Association (AFA) was the service's civilian advocacy and lobbying group, and in January 1970, its Air Force/Space Digest presented all of the salient A-X characteristics yet given in the CFP and DCP 23--and pointedly told readers that A-X was "persuasively cost-effective" in many ways. The service also elevated the A-X project's stature. The A-X project office had remained stuck within the F-X Systems Project Office (SPO), and as the Cheyenne encountered problems through 1969, Systems Command removed people from the A-X office to work other programs. Normally, an officer of at least colonel's rank supervised a new Air Force aircraft project, but at the time of the House's action, a major ran A-X affairs. By April 1970, Colonel James Hildebrandt was the chief of the newly created, and independent, A-X SPO.37

chairmanship apparently had more to do with the end of the seniority system than his defense views, as several chairmen lost their committees during the mid 1970s. Defense procurement observer Nick Kotz believes the ensuing diffusion of power within Congress ironically led to less defense fiscal self-discipline, as more members scrambled for defense contracts for their constituents; see Kotz, Wild Blue Yonder, 126-127.

<sup>&</sup>lt;sup>37</sup>"AF Concerned Over AX Opposition," <u>AFJ</u>, 14-15 (A-X versus OV-10 comparisons; the OV-10, by the way, was only one-third the size and could carry only one-fourth the load of the proposed A-X, and later, the A-10); Christie, interview by author (asserts that A-X's early progress varied directly with the Cheyenne's progress); BGEN James Frankosky, USAF, Deputy Director of Operational Requirements and

Colonel Hildebrandt's office remained small, but this was due to a combined OSD and Air Force response to the congressional budget axe. Already in 1968, Dr. Foster and Systems Command chief General Ferguson had expressed support for actual flight competition between design prototypes, known as "fly before buy"--something not seen in the Air Force since the 1950s. And the Deputy Secretary of Defense in President Richard Nixon's newly formed administration, David Packard, led the move toward some sort of "fly before buy" competition as a means to reduce runaway costs and developmental fiascos. Packard's actions spurred the new Air Force Secretary, Robert Seamans, to explore how to implement the philosophy, and on 10 October 1969, Seamans chose an approach called parallel undocumented development. As later promulgated in DCP 23A, the successor to DCP 23, this developmental style featured a minimally manned SPO that monitored selected contractors' efforts to produce a design that best met the Air Force's specifications. DCP 23A expressed the hope that parallel undocumented development would prevent concurrency, minimize development time, and above all, reduce cost. The Systems Command history saw the progress toward competitive prototyping as something internal to OSD and the Air Force, but Seamans' choice of this austere version of competitive prototyping occurred a few weeks after Congress' sharp fiscal rebuff.<sup>38</sup>

Development Plans, Headquarters Air Force, "Systems Management Directive #SMD-0-379-329A(1), 10 April 1970, supporting documents (establishes A-X SPO); Gunston, <u>Attack Aircraft</u>, 250 (confirming commentary on OV-10's CAS plane weakness--it "lacked punch"); Mischler, 91-92 (Mischler focuses upon the project development and few of the outside factors); Edgar Ulsamer, "AX: Lethal, Accurate, and Cheap," <u>Air Force/Space Digest</u> 53 (January 1970): 33-39; and Volz, "AX vs. AH-56," 25 (A-1 comparisons). An unabashed account of the Air Force Association's fight for the service is in a history written by one of <u>Air Force/Space Digest</u>'s writers; see James Straubel, <u>Crusade for Airpower: The Story of the Air Force Association</u> (Washington, D.C.: Aerospace Education Foundation, 1982). That it fights hard for the service's image and interests can be seen in various historians' wounded yelps in Tom Englehardt and Edward Linenthal, eds., <u>History Wars: The Battle for the Enola Gay and Other Battles for the American Past</u> (New York: Henry Holt and Company, 1996).

<sup>&</sup>lt;sup>38</sup>"AX Fighter Paved Way for Prototyping," <u>AW&ST</u> 94 (28 June 1972): 103-104; "Competitive Prototype Program Planned for USAF AX Aircraft," <u>AW&ST</u> 92 (4 May 1970): 25; Gunston, <u>Attack Aircraft</u>, 254-267; "Fly Two Before Deciding,"

Furthermore, it reflected the Air Force's doctrinally driven spending priorities, as given by General Ryan in congressional testimony a few months later. He told the legislators that the F-X air superiority fighter was the number one priority, followed by the B-1 strategic bomber, then the Airborne Warning and Control System (AWACS) plane, and finally, the A-X. Neither the F-X, the B-1, nor the AWACS featured a prototype flyoff in its development, even though the service procured each at the same time as the A-X. As one observer pointed out, the contractor cost and risk involved in building admittedly complex planes for a winner-take-all competition was simply too much. (There were competitions for various components of these planes, however.) Another observer involved with developing both the A-10 and F-15 averred that in its fervor to create the ultimate air superiority machine, the service made the F-15 the best plane money could buy--literally. From the start, the A-X represented something of a reaction against high technology. It was supposed to be an updated A-1, the basic propeller plane that seemed to disprove the need for high speed and complex fire control avionics in the CAS arena. Given these considerations, and the Air Force's intention to preserve its CAS mandate at

<sup>&</sup>lt;u>Government Executive</u> 2 (November 1970): 30; Mischler, 72-82; Morton Mintz, "The Maverick Missile: If at First You Don't Succeed . . . A Case Study of Defense Procurement Problems," <u>The Washington Post</u>, article series starting on 23 February 1982, reprinted in <u>More Bucks</u>. Less Bang, ed. Rasor, 182; COL Peter Odgers, USAF, "Design-to-Cost, The A-X/A-10 Experience," (Research report, Air War College, 1974), 1-5 (Odgers served on the A-X SPO during this time); David Packard, Deputy Secretary of Defense (DEPSECDEF), "Improvement in Weapons Systems Acquisition," Memorandum to Secretaries of the Army, Navy, and Air Force, 31 July 1969, supporting documents; Sprey, interview by author; Sweetman, 8; and Edgar Ulsamer, "The A-10 Approach to Close Air Support," <u>Air Force Magazine</u> 56 (May 1973): 41 (Ulsamer mentions that the last prototype competition occurred between the F-105 and F-107).

Mintz gave Sprey credit for introducing the competitive protoype idea to Air Force Secretary John McLucas and, apparently, the rest of the service. The sources available to the author indicate that competitive prototyping was in the minds of other influential people besides Mr. Sprey. Sprey himself gave Packard some credit during the author interview.

the same time, it is not surprising that Seamans, Ryan, and company seized upon the low-priority, low-budget plane to reintroduce prototype competition.<sup>39</sup>

At the same time that the House cancelled A-X funding, both houses of Congress quickly seconded the Army's move to suspend funds for the Cheyenne. But congressmen still evinced interest in the Cheyenne, as shown by their insistence upon comparing the A-X and the Cheyenne in order to determine the best CAS aircraft to buy. Thus, as OSD reviewed the two programs in summer and fall 1969, it brought staffers from both services to discuss their respective air support aircraft. Dr. Foster chaired the meetings, and in them, the Army prioritized the types of air support it wanted from the Air Force. These replicated the Air Force's own doctrinal priorities. In fact, the senior Army representative, Force Development Chief of Staff (and former Army aviation advocate and leader) General Robert Williams told Foster and company that if the Air Force really wanted to provide CAS to the Army, it should upgrade its attack jets to accomplish night and

<sup>&</sup>lt;sup>39</sup>Burton, <u>Pentagon Wars</u>, 13-19 (Air Force's headlong push for an ultra-high technology F-X); Gunston, Attack Aircraft, 260 (source for prohibitive expense of F-X and B-1prototyping); Address by Grant Hansen, Assistant Secretary of the Air Force for Research and Development, to the American Institute of Aeronautics and Astronautics, Washington, D.C., reprinted in Supplement to the Air Force Policy Letter for Commanders #3-1973 (Washington, D.C.: SAFOII, March 1973): 2-7 (source for decision to create competitions for components of the more expensive planes); Mischler, 66-67; Neufeld, "The F-15 Eagle," 32-36, 66-68, Sprey, interview by Neufeld, 5-9, 18-19 (source for the Air Force's desire to pay dearly for the F-X); Stevenson, Pentagon Paradox, 1-50, 152-158; and Volz, "A-X vs. AH-56," 26 (report on Ryan 19 February 1970 testimony to the House Appropriations Committee about priorities). Neufeld writes that the Air Force and Packard believed that prototyping induced unacceptable costs and delays to urgent Air Force programs, but they at least included project milestone review procedures to prevent overruns. Neufeld and Stevenson both recount the wariness of many government officials, including some congressmen, to conduct simulated air combat between the Air Force's air superiority jet, the F-15 (what the F-X project created), and the Navy's new fighter, the F-14. The costs and implications involved scared too many people, and provide another example of why there was no F-X flyoff. Gregory, "Uncertainty," mentions that the Air Force and Navy wanted the highest performance for their fighters. which meant serious cost inflation. He believes that competitive prototyping would have been irrelevant in cutting costs for these planes, given that money seemed to be no object to their creators. Interestingly, Gregory only mentions the YF-16/YF-17 flyoff when discussing "fly before buy" examples.

all-weather CAS. When queried about the Air Force's preferences given the demonstrated lack of congressional fiscal support, the senior Air Force representative, Vice Chief of Staff General John Meyer, said that he would choose air superiority fighter projects.<sup>40</sup>

An Army representative at the meetings found Meyer's statement "rather remarkable," given congressional scrutiny and the services' high-stakes competition over this mission. But like his Chief of Staff did months later, Meyer simply voiced his service's doctrinal priorities under the pressure of an either-or choice. Other top Air Force leaders were only too happy to scrub the A-X, however. When the Army cancelled the Cheyenne contract, TAC's General Disosway approached the new Air Force Chief of Staff, General John Ryan, and told him he "could get rid" of A-X. Of course, as Pierre Sprey observed, Ryan had to protect his service's right to the CAS mission and resisted such a precipitant move. This was especially so with Congress threatening to enter the interservice debate and make its own decisions. In fact, the Air Force and Army Secretaries intervened at this time with an agreement which helped secure the A-X's future versus its rival-cum-reason for existence, the Cheyenne.<sup>41</sup>

<sup>41</sup>The Army representative was Harrison, and in "Gift," 38, he describes the details of the meeting. Disosway quote is from Dick, <u>Disosway</u>, 181-182. Neufeld, <u>Sprey</u>, 19-20, provides insight into McConnell's and Ryan's duty to the Air Force in spite of their subordinates.

<sup>&</sup>lt;sup>40</sup>DDR&E, "Minutes of the Defense Acquisition Review Council (DSARC)," (Washington, D.C.: DDR&E, 31 December 1969), 1-2, supporting documents; "HASC [House Armed Services Committee] Restores Most Senate Weapons Cuts," <u>AFJ</u> 107 (4 October 1969): 2; Harrison, "Gift," 38; Mischler, 66-67 (writes that the meeting between service representatives occurred under the auspices of above-cited DSARC that the Air Force wanted and got in fall 1969; besides asking about the A-X's night/all-weather capabilities, the Army representatives questioned whether the Air Force could afford to fund a dedicated CAS planes, given the service's other doctrinal commitments); and Volz, "A-X versus AH-56," 25 (recounts congressional questioning about A-X versus Cheyenne). Not all Army officers were ambivalent about or hostile to an Air Force CAS plane, however. Retired Army BGEN John Bahnsen, who worked force development issues for Army aviation in the Pentagon from 1966 through 1968, later said that he thought one of the Army's intentions during this time was to scare the Air Force into meeting its commitments (telephonic interview by author, 1 July 1997, recording and notes in author's possession).

"Two service secretaries entered this arena where angels should fear to tread," Robert Seamans later wrote of his CAS aircraft agreement with Army Secretary Stanley Resor. The agreement's primary motivation was that congressional heat about CAS aircraft funding drove Deputy Defense Secretary David Packard in January 1970 to ask both service secretaries to resolve their CAS aircraft differences. But the two secretaries also independently realized that interservice rivalry threatened to ruin what they believed were two aircraft that actually complemented each other in the CAS arena. Seamans had visited combat units in Vietnam and wanted the Air Force to build planes that could better fulfill the service's CAS commitment to the Army. And though he believed that helicopters provided valuable support, he felt that they were far too vulnerable to perform CAS alone. Sources indicate that Resor needed an Air Force guarantee of support for the advanced armed helicopter now that the Cheyenne was in trouble. Their March 1970 agreement specified that the two aircraft's fundamental aerodynamic and design differences made them suitable weapons for different types of air support. The Cheyenne possessed a helicopter's flexibility in maneuver, take-off, and landing that made it better at such operations as helicopter escort, urban CAS, and highly fluid, close-in ground combat situations. The A-X was faster, flew further and for a longer time, and carried greater firepower than the helicopter. (Seamans also believed it was far more rugged than a helicopter, though this was a contentious issue and was left out of the agreement.) They also envisioned situations where the two aircraft would work together to provide mutual support in finding targets, avoiding/suppressing air defenses, and providing combined fire support. The two secretaries did not agree on everything, and one scholar criticized them for not achieving agreements on fundamental doctrinal issues as well as aircraft suitability for every air support task. Given the intense feelings at the time--not to mention external pressure from Congress-this was a tall order. The secretaries may only have been able to "agree to disagree" on some issues (such as helicopter vulnerability), but their proposal to

keep both programs alive was important to the CAS plane's and advanced attack helicopter's future.<sup>42</sup>

It also raised a firestorm of anger among uniformed subordinates in both services. Seamans had the following recollection of his pact with Resor: "I later heard that Stan had said, 'Bob and I must have done something right. Both of our staffs told us that we had sold them down the river." Indeed, Seamans recalled that General Ryan would not talk to him for a few days out of fear that he "would be too emotional" if he personally spoke to the secretary. The reason for the rancor was that advocates on both sides felt that their respective secretaries reprieved a threat to their own service's aircraft. Intense feelings remained, and one example was General Ryan's reply to Army Chief of Staff General William Westmoreland's January 1970 assessment of Army CAS needs. Westmoreland reiterated General Kinnard's assertion that the Army's air support priorities matched Air

The above Memorandum for the Secretary of Defense is the Seamans-Resor Agreement, and beyond the four-page letter, there are three lengthy attachments that discuss the two aircraft and the various types of CAS as they were understood in 1970. These attachments described the types of CAS in which each aircraft excelled, and which types could benefit from coordinated use of both aircraft. Interestingly, Attachment 3, "Weapons System Application--II" states that armed helicopters had a twenty- to thirty-minute response time to ground requests (p. 8) and that many helicopter units in Vietnam were not co-located with infantry units (Annex B, p. 2-3). This information belied two of the Army helicopter advocates' assertions about helicopter advantages--super quick response time because the helicopter units would live with the units they supported. Attachment 3's Annex A, pp. 1-3 also contains praise for the A-1's loiter time, which amply enabled the planes to hold airborne and immediately respond to CAS tasking--as well as provide sustained support--in the Vietnam Battles of Plei Me (1965), Bong Son (1966), and Cu Phong Massif (1966). Volz' article also contains praise for the A-1 and the hope that the A-X will be a worthy successor.

<sup>&</sup>lt;sup>42</sup>Quote is from Robert Seamans, <u>Aiming at Targets: The Autobiography of</u> <u>Robert Seamans</u> (Washington, D.C.: NASA History Office, 1996), 174 (quote), 175. Other sources are Robert Seamans, telephonic interview by author, 4 June 1997, tape recording and notes in author's possession; Davis, 22 (scholar and "agree" quote cited in text); Futrell, <u>Ideas</u>, vol. II, 521-522; Goldberg and Smith, 34-35; Harrison, "Gift," 38 (certainly believes that this agreement was important for the CAS plane and advanced armed helicopter); The Honorable Stanley Resor and the Honorable Robert Seamans, "Systems for the Air Delivered Fire Support of Ground Forces," Memorandum for the Secretary of Defense (Washington: Departments of the Army and the Air Force, 26 March 1970), supporting documents; and Joseph Volz, "A-X vs. AH-56," 25-26.

Force doctrinal preferences, and that perhaps the Air Force tactical plane designs "*should* emphasize multi-mission capabilities" (italics are this author's). Ryan matched this ironic twist by sharply reminding Westmoreland that:

We believe that only by optimizing an aircraft for close air support can we provide the capabilities outlined in your memorandum. Our experience has shown that a multi-mission design must sacrifice too many of the characteristics desirable in a close air support aircraft in order to meet the requirements of its other roles.

As the Air Force leadership expressed renewed enthusiasm for the CAS plane via journal articles, SPO reinforcements, inter-service agreements, and ringing declarations on behalf of single-mission tactical planes, the Air Force staff designers pressed forward.<sup>43</sup>

### Further Concept Issues

In March 1970, OSD released DCP 23A, which incorporated changes based upon the previous DCP, outside factors, and the Army's concerns expressed in the autumn DSARC. The Air Force deferred somewhat to Dr. Foster's concerns, and offered a design specification for a slightly smaller plane than that envisioned in the CFP. The new DCP ratified the previous document's preference for competition between prototypes, as well as the parallel undocumented development that Secretary Seamans approved in 1969. And though the service admitted that the A-X would need fighter escort in situations where enemy fighters contested air superiority, it asserted that the plane could provide CAS in all theaters and not just Vietnam. The Air Force answered the Army's night/all-weather capability concerns by promising to study incorporating the necessary features into the A-X. Finally, DCP 23A included provision for a jet-powered plane.<sup>44</sup>

<sup>&</sup>lt;sup>43</sup>Futrell, <u>Ideas</u>, vol. II, 519-520 (quotes other officers' comments revealing the irony of the Air Force's insistence upon a CAS plane and the Army's ambivalence about same); Goldberg and Smith, 34-36 (Westmoreland quote, 35, and Ryan quote, 36); Harrison, 38-39; and Seamans, <u>Aiming</u>, 174 (first and second quotes), 175; and Seamans, interview by author.

<sup>&</sup>lt;sup>44</sup>Mischler, 67-71, 79, 82-84; and Pentland, "Evolution."

The last two items rate further discussion. Especially in the situations where troops are actively engaged, confirmation of the target is of utmost importance to the CAS pilot, and visual identification is the surest means. The artificial means for determining the target such as radar and infrared were not reliable--or at least required enough advance planning and increased pilot workload to make the effort unsuitable for the fluid circumstances of battlefield air support. Yet the Army always wanted and the Air Force searched, and continues to search, for technology which would allow fixed-wing CAS at night and in clouds. There was also the monetary cost involved with incorporating night/all-weather attack technology-radar, inertial navigation systems, FLIR-into a plane which was number four on the service's funding priority list. "An unconscionably high price," was the way one Air Force leader put it, and if one required proof of the developmental and cost pitfalls of incorporating night/all-weather technology, one only needed to look at the F-111 and Cheyenne projects. The service promised to examine the possibilities, if only to mollify the Army, but rightfully insisted that the A-X could at least operate in poor weather outside of clouds, if it could not actually perform CAS in clouds. That is, Air Force leaders emphasized that visual recognition was important to CAS. And the AX, like the A-1 before it, possessed the combination of maneuverability and slow speed to allow it to work visually in weather poor enough to prohibit other planes from doing so.45

<sup>&</sup>lt;sup>45</sup>Sources for night/all-weather CAS capability--difficulties in acomplishing it, the search for it, and the A-10's part in it, are from: MAJ Howard Barnard, USAF, "Is Tactical Support of an Airborne Battalion Feasible in Adverse Weather?" (Master's thesis, Army Command and General Staff College, 1979), 32-33, 57-59; Bell, "Close Air Support for the Future," 34-36, 93-99 (details target acquisition difficulties that exist even in good conditions and expresses hope--in 1992--that FLIR and night vision goggles [NVGs] will help night CAS); Natalie Crawford, "Low Level Attacks of Armored Targets," RAND Paper, (Santa Monica, Calif.: The RAND Corporation, 1977), 11-16 (discusses high pilot workload involved with flying against tough defenses in bad weather, especially with high airspeeds and equipment operation tasks); GEN Wilbur Creech, USAF (ret.), telephonic interview by author, 30 March 1997, tape recording and notes in author's possession (a former TAC commander, GEN Creech told the author that night CAS was tough to accomplish, even with technological aids); Gunston, Attack Aircraft, 270; MGEN Fred Haynes, USMC (ret.), and COL Glenn Jones, USAF (ret.), "Air Support of the 'Close-In Battle,' Future Directions," in Air Support of the Close-In Battle: Past Lessons, Present Doctrine, Future Directions: Proceedings of the U.S. Air Force Aerospace Power

The A-X would be jet powered, and this was because the technology had caught up while the design encountered delays. Due to its excessive fuel consumption, a traditional turbojet engine was incompatible with the designers' loiter intentions for the A-X. This was the reason that, throughout the late 1960s, the Air Force publicized design concepts that contained the much more fuel-efficient turboprop engines. In the meantime, several aerospace engine companies worked on turbofans mostly as a means of breaking

Symposium, by the U.S. Air Force Air War College (MAFB, 9-10 March 1987), 110-111 (explains that none of the current night/all-weather fire control devices--radar or FLIR--can differentiate enemy and friendly forces at normal weapons employment ranges); LTCOL Robert Hinds, USAF, "Replacing the A-10," (defense analytical study, Air War College, 1989), 36-37 (observes that pilots flying the proposed A-10 replacement, the F-16, could have problems with the plane's high speed and complex fire control avionics, even though these gave pilots a potential night/all-weather CAS ability); COL Robert Ramussen, USAF, "The A-10 in Central Europe," Air University Review 30 (November-December 1978): 27-28 (states that the A-10 was designed to fly in one-thousand foot cloud ceiling and one mile visibility weather--normal "visual flight rules" [VFR] weather is 1500 foot ceiling and three miles visibility); V.H. Reis, "Close Air Support Systems: A First Order Analysis," Technical Note 1980-5, (Lexington, Mass.: Massachusetts Institute of Technology [MIT] Lincoln Laboratory, 19 February 1980), 29, 32, 35 (mentions that all aircraft must close with the enemy to determine targets in CAS); MAJ L. Michael Ritchie, USAF, "Technological Solutions to the Problem of Fixed-Wing Air-to-Ground Fratricide, [sic] Do They Address the Fundamental Causes?" (Master's thesis, Army Command and General Staff College, 1993), 102-110 (describes various technological devices for preventing CAS friendly fire incidents in various conditions, and concludes that none of these provides a sure-fire way of preventing target mis-identification); Richard Simpkin, Antitank: An Airmechanized Response to Armored Threats in the 90s (Oxford: Brassey's, 1982), 209 (identifies current technology's inability to identify anything less than large vehicle concentrations in night or bad weather; also notes that these conditions make low-level flying tough); Pierre Sprey, interview by author (Sprey mentioned that the A-X concept designers had European weather in mind); Sweetman, 8; and H.W. Wessely, "Limiting Factors in Tactical Target Acquisition," RAND Paper #P-5942, (Santa Monica, Calif.: The RAND Corporation, 1978), 18-21 (concludes that determining which tactical target-tank, truck, etc.-to hit is tough even in good weather, but will be worse in bad weather regardless of equipment used); MAJ Charles Westenhoff, USAF, "Close Air Support: Battlefield Challenges, Strategic Opportunities," in Air Support of the Close-In Battle: Proceedings, 59-63 (describes difficulty of visually acquiring camouflaged targets in good weather and explains why inertial or global positioning satellite [GPS] navigation systems do not guarantee hitting the target in bad weather; also describes heavy cockpit task loading when attacking a well-defended CAS target).

into the airliner market, where fuel-efficient engines made good financial sense. In a turbofan engine, the first stage of compressor fan blades is extended beyond the engine's diameter at the front. The outer ends of these particular blades are carefully crafted to direct air along the external sides of the engine and produce not only extra thrust but also air cooling of the jet's hot section. The result is greater thrust than a turboprop but less fuel consumption than a turbojet. The Air Force A-X designers noticed two likely candidates for their plane. In 1968, General Electric won a Navy contract to produce a turbofan, the TF34, for an antisubmarine patrol plane, the S-3. Meanwhile, Lycoming Company rebuilt its T55 turbojet into a turbofan engine to compete in the airline market. Both engines seemed to have the requisite thrust and fuel specifications for the A-X, and so DCP 23A included them as likely candidates for the A-X.<sup>46</sup>

## Initial Contract Work, Gun Development, and More Congressional Pressure

The engine issue affected the efforts to define a contract that were underway in by mid 1970. In May 1970, the Air Force released a Request for Proposal (RFP) to twelve civilian contractors for aircraft construction bids. Compared to RFPs for other aircraft, this

<sup>&</sup>lt;sup>46</sup>Hugh Ahmann, <u>Interview of Lieutenant General Leroy J. Manor</u> (Eglin AFB, Fla.: USAF Oral History Program, 26-27 January & 9 May 1988), 93, transcript, AFHRC Holding K239.0512-1799; Gunston, <u>Attack Aircraft</u>, 256; COL Edsel Field, USAF, "A-10 Test and Evaluation: A Case Study," (MAFB: Air War College, 1976), 47; Mischler, 83-84; Sweetman, 28-32; and the following interviews by author: Christie, Sprey, and Welch.

LTGEN Manor points out that the Air Force, particularly the oncoming TAC commander GEN Momyer, wanted an all-jet tactical force because it represented progress; Christie, COL Field, Sprey, and Welch made similar observations about the service's predilection for jets. Sprey felt that props had certain qualities, such as fuel efficiency and excellent power response, but conceded that turbofans won out due to acceptable fuel efficiency and better thrust. Gunston and Welch thought the turbofan choice was good because turboprops were more vulnerable to damage (the turbofan also emitted a relatively low amount of heat-what tactical aviators call a "low heat signature"--which enables better evasion of heat-seking missiles). And though there is no written proof of this, the decision for a turbofan may also have been due to the recent congressional rebuff.

one was short and concise (just over one-hundred pages). In accordance with its parallel undocumented development plan for the A-X, the service included DCP 23A's general design specifications in the RFP and expected the contractors to come up with the best design. By August 1970, the Air Force stated that it would further review six of the returned proposals, and after a December meeting of the A-X DSARC, picked two companies, Fairchild-Hiller Corporation and Northrop Corporation, to build prototypes and compete in a government-run flyoff. The initial buy would be for six hundred aircraft with a twenty-six month competitive development period and an IOC of 1975.<sup>47</sup>

Although one might think that the contract selection process described so far revealed no problems with parallel undocumented development, two issues surfaced that would later challenge the A-X's existence. First, an Air Force attempt to make this project survive financially while it pursued other big-ticket items, created yet one more first-time weapons acquisition policy, design-to-cost. This policy meant that both the contractor and the government would adhere to the initial staff estimates for aircraft cost--accounting for later currency inflation--in all developmental actions involving the plane. Failure to meet the cost goals at various points would mean denial to proceed with the next phase. But the decision for turbofan engines increased the cost already envisioned in the earlier design

<sup>&</sup>lt;sup>47</sup>Mischler, 83, 89-102, and Aeronautical Systems Division (ASD), Headquarters U.S. Air Force, "A-X Specialized Close Air Support Aircraft, Request for Proposal, F33657-70-R-0896, Competitive Prototype Development Program," (Wright-Patterson AFB, Ohio: ASD, 7 May 1970), 1-2, supporting documents. The twelve companies were Beech Aircraft Corporation, The Boeing Company, Cessna Aircraft Company, Fairchild Hiller Corporation, General Dynamics Corporation, Grumman Aerospace Corporation, Lockheed Aircraft Corporation, McDonnell Douglas Corporation, North American Rockwell Corporation, Northrop Corporation, LTV Aerospce Corporation, and Textron, Incorporated. Fairchild-Hiller, Boeing, Northrop, Cessna, General Dynamics, and Lockheed were the six semi-finalists. Pierre Sprey, in interview by author, placed great emphasis upon the RFP as the decisive document in the A-10's development. He believes that this is where most of the battles over the plane's design concept occurred. However, though Mischler mentions that TAC made an apparently desperate attempt during RFP formulation to replace the design with one resembling the F-5, evidence indicates that the key conceptual decisions occurred in previous documents such as the CFP and DCP, and that the RFP mostly ratified them. Additionally, Mischler describes an RFP construction process that took weeks and occurred at the highest levels of Air Force leadership.

studies, and in the RFP the service had to revise the cost per plane from 1.2 million dollars to 1.4 million dollars in Fiscal Year 1970 dollars. It was to the service's credit that it at least picked engines already under development for other uses ("off the shelf," in government parlance). However, it was still the kind of thing that irritated a skeptical Congress only too willing to hold the service to its financial promise.<sup>48</sup>

The second issue involved the A-X's gun. In June 1970, as the service worked contractural issues for the plane, it also sent to DDR&E its DCP 103, which concerned gun design. DCP 103 specifically directed that the proposed 30mm gun be built only for the A-X, which meant that the service effectively abandoned its original intent to adapt it to other attack planes as well. This wedded the plane and its gun in fortune as well as in fact, something mutually guaranteed by the A-X RFP's demand that the plane meet not only cost-effectiveness goals but also weapons-effectiveness goals. The marriage of economy and effectiveness would be tricky, for DCP 103 demanded that the gun be effective against Soviet T-55 tanks (at that time the most prevalent model), and asked that designers determine and use the best shell. DCP 103 also confirmed a previous DDR&E recommendation that gun selection be based upon competition between the best two

<sup>&</sup>lt;sup>48</sup>Brown, <u>Flying Blind</u>, 332 (cites C-5 and F-111 cost overruns as catalysts); MAJ Roger Carleton, USAF, "The A-10 Design-to-Cost: How Well Did It Work?" (Fort Leavenworth, Kans.: U.S. Army Command and General Staff College, 1979), 3 (cites cost overruns with the C-5 and F-111 programs as another design-to-cost motivating factor, but observes that the F-X project observed no such restriction); Mischler, 98; Field, "A-10 Test," 49 (also cites C-5 and F-111 cost problems as an influence); COL Peter Odgers, USAF, "Design-to-Cost: The A-X/A-10 Experience," (Research report, Air War College, 1974), 1-5; and Wilson, "Fairchild A-10," <u>Flight International</u>, 708. In 1970, COL Odgers was then a major serving as Chief of Test and Development in the A-X SPO; see COL James Hildebrandt, USAF, "Program History, 1 January 1970 to 30 June 1970, A-X Specialized Close Air Support Aircraft," (Wright-Patterson AFB, Ohio: Headquarters, Aeronautical Systems Division, 27 October 1970), 3 (COL Hildebrandt's report also notes that the General Accounting Office [GAO] was already investigating the A-X project).

prototypes, a move that ultimately would help ensure that the economy and weapons "marriage" worked.<sup>49</sup>

The marriage had to work. Though Congress let the Air Force continue with A-X competitive prototyping, it further questioned the need for the CAS plane, given budget constraints and the existence of other aircraft that also flew CAS. Throughout early 1970, the House Appropriations Committee pressed OSD and the Air Force to justify the push for several planes to do the same mission. February hearings featured questions about why the OV-10 or Cheyenne could not be used instead. Secretary Seamans and General Ryan repeated findings in the A-X's developmental documents that the A-X far surpassed the OV-10 in loiter capability, weapons carriage capacity, and survivability. Concerning the Cheyenne, the Air Force leaders stated that the A-X could carry more weapons, and was faster, more survivable, and almost as maneuverable. Additionally, they asserted their service's right to fly CAS per past interservice agreements. In April 1970, the House Appropriations Committee Chairman, Representative George Mahon (D-TX), pointedly asked Dr. Foster if it was "essential" to support both A-X and Cheyenne, "in view of the fiscal problems which appear to be ahead." Foster replied that the choice was still undetermined, since neither machine was fully developed enough to make comparisons. Mahon also specifically asked Foster why the A-7 could not be used, and Foster replied that modifying it to fly the CAS mission like the A-X was too difficult. Additionally, the A-7 lacked the A-X's ability to fly in marginal weather. Though favorable to defense needs, Mahon was a fiscal conservative. He also was from Texas, the home state of

<sup>&</sup>lt;sup>49</sup>McMullen, interview by author; Mischler, 98; Odgers, 6; and Wall, "GAU-8/A," 3-9. Both McMullen and Wall note that competitive contracting also pertained to the ammunition. This idea's timing assumes importance later when the issue of credit for it arises. Wall also notes the other types of gun and ammunition rejected at this time: liquid propellant rounds (too expensive and unproven), sabot rounds (such as those used by tanks, but sabots pieces created an ingestion damage hazard for jet engines), and the Swiss Oerlikon cannon (not as reliable, and low firing rate). The latter weapon figures in the later history of gun development.

Ling-Temco-Vought (LTV), the A-7's maker. His questions on the A-7's behalf foreshadowed the partisan politics that would affect the A-X's later development.<sup>50</sup>

As if there were not enough attack planes already, the Marines wanted to buy a jet that they felt was optimum for their warfighting environment, the British Hawker-Siddely AV-8A Harrier. Since 1969, the Marines had conducted their own bureaucratic insurgency by procuring a small number of these first-ever vertical/short-takeoff-and-land (V/STOL) tactical jets, ostensibly for evaluation. They had considered buying Cheyennes for their CAS needs, but the Cheyenne's complexity and escalating cost scared them away. Though the Harrier cost roughly the same as a Cheyenne, it was an already developed design. It also possessed not only the Cheyenne's vertical-take-off-and-land (VTOL) capability, albeit with serious weapons carriage and loiter penalties, but it was also a tactical jet. As such, the plane fit their needs for a jet providing firepower and some aerial protection during amphibious operations that often offered only carrier decks and very short fields for flight operations. By 1970, they caught Congress' attention due to their

<sup>&</sup>lt;sup>50</sup>Congress, House, Hearings Before a Subcommittee of the Committee on Appropriations, Department of Defense Appropriations, Part 1, 91st Cong., 2d sess., 19 February 1970, 554, 636-640 (questions for Ryan and Seamans); Congress, House, Hearings before a Subcommittee of the Committee on Appropriations, Department of Defense Appropriations for 1971, Part 6, 91st Cong., 2d sess., 27 April 1970, 101-103 (Mahon questions Foster); Congress, Senate, Department of Defense Appropriations, Part 4, 4 May 1970, 41 (Seamans' statement before the committee emphasizes A-X simplicity), "Mahon Rites Friday," Midland Reporter Telegram, 20 November 1985, 1A, 2A (headline article from the Southwest Collections Archive at Texas Tech University claims that though Mahon was a "champion of strong defense," he also had a "passion for pay-as-you-go government" [2A]); Volz, "AX vs. AH-56," 25 (Volz is cited often in this chapter, but spring 1970 congressional skepticism and the recent Seamans-Resor Agreement are his big topics). The defense news media started to cover the CAS aircraft issue by this time, as some of the articles cited so far indicate. AFJ writer Brooke Nihart's short account of CAS doctrinal and interservice problems found the history to be rather intractable and sordid, with the Air Force mostly at fault; see Nihart, "Sixty Years of Unresolved Problems," Armed Forces Journal (25 April 1970): 19-24.

suddenly stated intent to buy many more Harriers, as well as the fact that the planes were foreign built.<sup>51</sup>

The Marine move was the last straw for Congress. As one Marine staffer close to the issue later commented, this was not a good time to bring a new plane into the Marine Corps. Congress' own commentary on its Fiscal Year 1971 budget intoned, "There is a serious question as to whether or not future Defense budgets can support the development and/or procurement of three separate aircraft weapons systems . . . to perform essentially the same mission." The Senate Armed Services Committee supported the House committee in the same report, condemning the services for a history of "parochialism" concerning the close air support mission. In spite of its own complaints, Congress allowed Fairchild and Northrop to continue their work on CAS plane competitors; the legislators at least liked the idea of a low-cost plane developed from head-to-head competition between contractors. However, in October 1970, the House Appropriations Committee directed OSD to "reevaluate the roles and missions and aircraft relative to close air support," and determine which of these planes was most suitable. The Air Force CAS plane's fate now lay with OSD and Congress.<sup>52</sup>

<sup>&</sup>lt;sup>51</sup>Bergerson, 125; LTCOL J.R. Braddon, "What Every Marine Should Know About Harrier," <u>Marine Corps Gazette</u> 55 (May 1971): 20-24; Gunston, <u>Attack Aircraft</u>, 96-99; GAO, <u>Close Air Support: Principal Issues and Aircraft Choices</u>, 19-21, 23, 26, 28 (cites Marine motivations for Harrier versus Cheyenne, and gives comparable costs for both machines); Goldberg and Smith, "Army-Air Force Relations," 36-37; and Bill Gunston, "Harrier," chap. in <u>The Great Book of Modern Warplanes</u>, Ray Bonds, and others, eds. (New York: Salamander Books, 1987), 349-351.

<sup>&</sup>lt;sup>52</sup>Congress, Senate, Report of the Special Subcommittee on Close Air Support of the Preparedness Investigating Subcommittee of the Committee on Armed Services, <u>Close</u> <u>Air Support</u>, 92d Cong., 1st sess., 1; and GAO, <u>Close Air Support</u>: <u>Principal Issues and</u> <u>Aircraft Choices</u>, are the primary sources for Congress' concern and directives in this matter (GAO, 6, contains the quotes in this paragraph). The Marine staffer was COL Noah New, who worked Marine air issues in the Pentagon and later appeared at the 1971 Senate close air support hearings; see New, "Perspectives of Close Air Support," <u>Marine</u> <u>Corps Gazette</u> 57 (May 1973): 14. Other sources provide current defense press assessment as well as the concern expressed within the Air Force about keeping the A-X's cost low so as to keep it alive; see "Close Air Support: Cheyenne vs. Harrier vs. A-X?" <u>AFJ</u> 108 (19 October 1970): 41 (Mahon's committee expresses serious doubt about

Thus, the influences deciding the CAS plane's existence and development were changing. It was born from a convergence of factors; the most prominent of which was a CAS machine that the Army built, the Cheyenne. The Air Force's ensuing effort to build the plane moved haltingly due to internal opposition, differing conceptions of the ideal CAS plane, the Cheyenne's mixed fortunes, and higher Air Force procurement priorities. New threats to the plane and to the Air Force's traditional claim on the CAS mission renewed the service's interest and sense of urgency. The result was a design that emphasized the qualities required for successfully conducting CAS. It would need these features, for though the plane faced a variety of challenges throughout its development and existence, the ones arising in the early 1970s took the form of direct trials.

supporting three aircraft for the same mission, and also scoffs at the 1.4 million dollar per plane A-X estimate as too low. Furthermore, some Pentagon officials believe that the A-X would never survive comparison with the A-7.); "Fly Two Before Deciding," 30 (describes the A-X's competitive prototype plan, and that Congress voted to authorize the approach; and still describes the A-X as a turboprop); Ludvigsen, "Up From the Ground or Down From the Sky?" 50 (Mahon's committee wanted an OSD study group); E.J. Nucci, Executive Secretary, DDR&E, "Minutes, DSARC Review, AX Aircraft Program," (Washington, D.C.: DDR&E, 17 December 1970), 2, supporting documents (COL Hildebrandt tells the DSARC that unless the service meets the 1.4 million dollar per plane figure, the plane might not survive); and Benjamin Schemmer, "Packard Personally Heads New Group to Resolve Inter-Service Close Air Support," <u>AFJ</u> 108 (15 March 1971): 15 (cites September 1970 House Appropriations Committee memo to Defense Secretary Melvin Laird, as well as FY 1971 budget report isued in October 1970, as sources for congressional warning; also points out that the A-X program was the only one of the three CAS aircraft programs that Congress did not enact budget cuts for FY 1971).

# CHAPTER VI TRIALS, 1971-1974

In early 1971, OSD faced a daunting task. Congress wanted it to study the three different attack aircraft sponsored by the Air Force, Army, and Marines, and then pick one to serve for all. This action threatened to escalate an already simmering interservice fight over CAS. Aware of congressional budget scrutiny and the fact that action in Vietnam could not provide only combat but also procurement success, the Army and Air Force were already arguing over the nature and implications of Army helicopter losses in a recent Vietnam War operation, Lam Son 719. Deputy Secretary of Defense David Packard led the OSD study, and faced these problems as well as differing service warfighting views, aircraft, and approaches to CAS. Overwhelmed by all of the details, requirements, and ramifications, his report preserved interservice peace and recognized American military realities by reporting that each service needed its respective plane. The Senate expressed dissatisfaction with Packard's inconclusive report and conducted its own hearings to determine the best machine. It fared no better than Packard and company, as parochial political and military interests among the senators led them to advocate the various candidates no less than the services they criticized. Also, they admitted that the services had legitimate differences that pertained to the wide spectrum of war that the United States, as a superpower, might encounter.

However, they did not completely let the services off the hook. In their final report, they directed that the A-X flyoff winner then participate in a flyoff competition against the A-7, which had done good CAS work in Vietnam. There might have been a flyoff between the Air Force CAS candidate and the Army's Cheyenne helicopter, but the Cheyenne project finally died due to cost overruns and developmental difficulties.

In the meantime, Fairchild-Republic and Northrop built their CAS plane candidates, and in late 1972, conducted their flyoff competition. The A-10 beat the A-9 because it handled better, and also was more maintainable and rugged. The A-10's victory was not due to political influence, as some observers later claimed. Congress did not forget about its directive for an A-X versus A-7 flyoff, and in late summer 1973, it cut A-10 funding until the Air Force set up the competition. Texas congressmen were particularly interested in the flyoff because the A-7 was built in their state. Further, the test gained special urgency after the 1973 Arab-Israeli War, known to history as the "October War," or "Yom Kippur War." High Israeli Air Force (IAF) losses on CAS missions led many observers to declare the demise of tactical air support, particularly when flown by slow planes like the A-10. In spring 1974, the Air Force conducted the flyoff, and the A-10 again emerged the winner.

Though the Air Force scrupulously ensured no bias among the pilots flying the two planes—after all, the New York congressional delegation also scrutinized the competition on behalf of its constituent, Fairchild-Republic—the premise for the flyoff favored the A-10. With America's long involvement in Vietnam now over, the theater demanding the most attention from the American military was Europe, where NATO faced overwhelming Warsaw Pact forces. The U.S. Army had no advanced attack helicopter to help its ground forces handle the Soviet tank hordes in a European war, and now looked more favorably upon the A-10. Further, in 1974 Defense Secretary James Schlesinger secured further official Air Force support for the CAS plane. He supported the service's desire for more tactical units to face the Soviet threat in return for the service's support for lower cost planes such as the A-10 and the F-16. This situation, along with the attitudes of the respective service leaders, contributed to a new era of cooperation between the Air Force and the Army. As such, the Air Force designed the A-10 versus A-7 flyoff to highlight the A-10's ability to fly in Europe's frequently marginal weather, while emphasizing the A-7's weakness in same.

Thus the Air Force CAS plane passed these trials. These confrontational affairs featured competition against competing CAS aircraft and concepts. If nothing else, one could say that the plane so far had stood up to the best its opponents could throw at it.

### OSD Attempts to Answer Congress Against a Backdrop of Bureaucratic and Real Combat

In late 1970, OSD responded to Congress' call for a study of the various services' CAS aircraft proposals. Congress dismissed the answer as too "perfunctory," according to one account. And so, on 26 February 1971, Deputy Defense Secretary David Packard directed a full study of CAS roles-and-missions differences between the services as they pertained to choosing a CAS plane. Besides Congress' rebuff, another reason for Packard's directive may have been that events in Vietnam threatened to escalate the CAS plane issue into another public interservice fight.<sup>1</sup>

In early February, a South Vietnamese Army incursion into Laos, Operation Lam Son 719, stalled and then turned into a rout. The Americans wanted to interdict North Vietnamese supply lines and bases existing just outside the Vietnamese border, just as they did the previous year in the Cambodia invasion. Specifically, the targets for this excursion would be the famous "Ho Chi Minh Trail" and supply depots around Tchepone, Laos. But in this case, only the South Vietnamese Army entered Laos. President Nixon wished to prove the success of his Vietnamization policy, and after the 1970 Cambodian operation, an angry Congress forbade American ground forces to enter neighboring countries. Thus, only American aircraft participated in Lam Son 719, and though the South Vietnamese Army's poor showing stirred national media debate about Vietnamization, the air combat results excited the lesser-known CAS debate.<sup>2</sup>

U.S. Army helicopters supporting the South Vietnamese encountered far tougher anti-aircraft defenses--radar-controlled AAA in some instances--than they had seen before, and their normal tactic of flying low over the ground (two thousand feet or less) made

<sup>&</sup>lt;sup>1</sup>Schemmer, "Packard Personally Heads New Group," 29.

<sup>&</sup>lt;sup>2</sup>Glen Gendzel, "Lam Son 719," in <u>Encyclopedia of the Vietnam War</u>, ed. Stanley Cutler, (New York: Charles Scribner's Sons, 1996), 276; and Keith Nolan, <u>Into Laos:</u> <u>The Story of Dewey Canyon II/Lam Son 719; Vietnam 1971</u> (Novato, Calif.: Presidio Press, 1986), 359-360. Vietnamization was Nixon's program allowing/making the South Vietnamese assume a greater share of military responsibility as American troops departed; see Stanley Karnow, <u>Vietnam, A History</u> (New York: The Viking Press, 1983), 629.

them easy targets for communist gunners. Additionally, South Vietnamese soldiers at the landing zones seemed more intent upon boarding the helicopters and leaving Laos than in providing suppression fire for the helicopters as they approached. The actual helicopter casualty counts were, and remain, in dispute. Army helicopter advocates mostly tried to downplay or revise the implications of Lam Son concerning helicopter survivability against antiaircraft defenses. They pointed out that, after some initial surprises, they changed altitudes and flight routes to avoid further losses. That service also claimed that helicopters enjoyed a key advantage over fixed-wing planes in that a stricken helicopter could autorotate to the ground and be retrieved later (an autorotation occurs when a helicopter pilot with a failed engine modulates the main rotor blades' pitch for a controllable descent). Thus, the Army people asserted that such an aircraft was not "lost" if it could be retrieved and repaired.<sup>3</sup>

Air Force leaders and other critics countered that Army commanders often claimed wreckage as a retrieved helicopter, and accused the Army of doctoring the loss figures (there were some Army observers who then and later conceded serious losses, albeit quietly). The service quickly seized upon the Lam Son results as proof of fixed-wing ruggedness versus rotary-winged weakness. One day before Lam Son officially ended, the

<sup>&</sup>lt;sup>3</sup>An early pro-helicopter account is George Weiss, "CO [Commanding Officer] 2/17 AirCav: 'Gunships Took Tanks, Survived Flak' in Laos," AFJ 109 (19 April 1971): 22-23. It covers Army AH-1 Cobra squadron commander LTCOL Robert Molinelli as he led his attack ships in Lam Son. Molinelli said that his machines initially took some losses, but adjusted their tactics-specifically, they raised their altitudes to avoid small arms fire and chose routes that avoided more serious threats. Weiss writes that Molinelli was "the foremost military advocate of the armed helicopter." Molinelli previously had commanded the Army's Cheyenne test unit; see Hessman, "Into the Inventory," AFJ, 11. A later pro-helicopter account is John Everett-Heath, Helicopters in Combat: The First Fifty Years (Poole, Dorsett, U.K.: Arms and Armour, 1992), 100-102, which concedes the official Army 15 percent loss rate (107 shot down and 600 damaged, some beyond repair); but counters that most of these were transports and that the helicopter men adjusted tactics as necessary. He concludes that "the helicopter proved itself in a particularly hostile environment " (101). James Bradin does not even mention Lam Son in his Army aviation history, From Hot Air to Hellfire. Frederic Bergerson, in The Army Gets an Air Force, 123, writes that the loss figures are in dispute, but focuses upon the Air Force's immediate charges of helicopter vulnerability.

Air Force completed a CHECO history of the battle, criticizing Army helicopter vulnerability while praising fixed-wing jets for destroying communist tanks (the North Vietnamese were starting to introduce these into the war) and providing what anti-aircraft suppression there was. The Air Force argument was that though helicopters might survive against weak air defenses, they would not do so in the tough European environment upon which the military increasingly lavished attention as the Vietnam War de-escalated.<sup>4</sup>

<sup>&</sup>lt;sup>4</sup>Robert Seamans describes Air Force suspicions of Army loss rate counts, writing that "the Army kept helicopters in their operational inventory if they could retrieve any identifiable part of the aircraft"; see Seamans, Aiming at Targets, 174 (he reiterated this point in his author interview). LTGEN Marvin McNickle, who commanded both Thirteenth and Seventh Air Forces (the latter unofficially for a short period after its commander, GEN John Lavelle, was relieved) in Southeast Asia, made a similar observation; see Ahmann, McNickle, 93-94. Keith Nolan, in Into Laos, 358, also mentions the retrievability policy and thus accuses the Army of "gerrymandering" its Lam Son helicopter loss figures. He also infers that the losses were higher than the official estimate. Of course, COL J.F. Loye, USAF, and others, in the U.S. Air Force Project CHECO "Lam Son 719, 30 January-24 March 1971: The South Vietnamese Incursion Into Laos," (Hickam AFB, Hawaii: HQ PACAF, 24 March 1971), xii-xvii, 104-115, criticizes Army helicopters while praising its own fixed-wing tactical planes. Air Force historians Earl Tilford, in Setup, 201; and Kenneth Werrell, in Archie, Flak, AAA, and SAM, 112-114, both highlight the helicopters' Lam Son difficulties, and also assert that the Army hid its true Lam Son losses. A hyperbolic description of helicopter misfortunes is in military reformist reporter Gregg Easterbrook's "All Aboard Air Oblivion," Washington Monthly (September 1981), reprinted in More Bucks, Less Bang, ed. Rasor, 57-60 (page reference to reprint).

Finally, some Army sources indicate that Lam Son was a tough time for their helicopters. LTC Rick Johnson, USA, was a helicopter veteran of Lam Son 719 (as of March 1997, he was Director of Plans, Training, Mobility and Security at the Army Aviation Center, FT Rucker, AL), and said that his unit suffered 30 percent losses when one accounted for outright shootdowns and retrieved wrecks. However, he added that the battle was a learning experience for the helicopter pilots, and they successfully adjusted their altitudes and ingress routes to minimize further losses; Johnson, telephonic interview by author, 14 March 1971, notes in author's possession. The papers of the 101st Airborne Division Chief of Staff at the time, COL Donald Seibert, USA, at Carlisle Barracks, AMHI (the 101st's helicopters flew at Lam Son) reveal Lam Son-driven doubt about a helicopter's ability to survive heavy air defenses unaided (actually, he regards Lam Son as a medium intensity air defense environment). He praises tactics adjustments that reduced further losses, such as altitude changes, changed ingress routes, and faster landing zone approaches; but states that the helicopters need better threat suppression, which includes tactical plane support. He does not believe that helicopters can be thrown into any battle

Perhaps due to a combination of Lam Son and the upcoming OSD review, in March 1971 the Army unilaterally, and thus rather impertinently, rescinded a Department of Defense (DoD) policy statement. This was the 1956 DoD Directive 5160.22, which had denied the Army and reserved to the Air Force the right to conduct CAS. The stage was set for another public brawl between the services over a mission as well as the funding and resources that went with it. It was a fight that senior leaders in all of the services did not want. There were distant memories of the 1949 Admiral's Revolt, and more recent memories of a bureaucratic fight during the height of the 1968 Tet Offensive. During that desperate battle, Generals Westmoreland and Momyer fought Marine commanders over placing Marine tactical air units under control of a central air commander, who was the Air Force General Momyer. The fight waxed so intense that Westmoreland considered resigning over it, and not over the real battle which caused so much consternation among Americans at home! This fear, and Packard's inclusion of senior officers from the affected services--Army aviation leader General Robert Williams, TAC commander General William Momyer, Marine air leader Major General Homer Hill-led to greater cooperation in the study.<sup>5</sup>

Bergerson's account and Packard's testimony indicate that the Army was merely shedding the old regulations and agreements due to the upcoming OSD study. Also, Bergerson writes that Army leaders at this time forbade their attack helicopter aviators to use the term "close air support" and even the cosmetic term "direct support" to describe

without prior tactical planning, and praises the success of combined fixed-wing and helicopter operations in Lam Son. The specific papers are Memo for Record, "Airmobile Operations in Support of Operation Lam Son 719," 20 March 1971; and "The Regulars," (Seibert's unpublished autobiography, 1988 revision), 1056-1058.

<sup>&</sup>lt;sup>5</sup>The Packard study group's composition is from Congress, Senate Hearings, <u>Close</u> <u>Air Support</u>, Appendix A, 413. The formal name for Packard's study group was the Close Air Support Review Group. The other members were Dr. John Foster, DDR&E, Gardiner Tucker, Assistant Defense Secretary for Systems Analysis, and Navy VADM John Heinel. The fight over a single manager of tactical air support during the Tet Offensive is worthy of a Ph.D. dissertation, or at least a Master's thesis. A few summaries of the incident are in Futrell, <u>Ideas</u>, vol. II, 283-284; Johnson and Winnefield, <u>Joint Air</u> <u>Operations</u>, 70-73; Mrozek, 82; and Sbrega, 456-464. The Army's revocation of DoD 5160.22 is from Bergerson, 129-130, 137; David Packard testimony in Congress, Senate Hearings, <u>Close Air Support</u>, 22 October 1971, 12-13; and Goldberg and Smith, 37.

Packard's study group was supposed to resolve service roles and missions as they pertained to CAS and CAS aircraft choices. This was an exceedingly tall order. The Air Force and Army Secretaries, as well as OSD's Weapons System Evaluation Group (WSEG), had already dodged the issue. And the previously mentioned Army Command and General Staff College research study completed during this period showed that officers within the various services could not agree upon the precise nature of the mission. Packard's group initially was game for the task, but even the study questions that they allowed the defense publication Armed Forces Journal to publish proved how daunting it really was. Covering nearly three pages, the questions cited in the article involved four different warfighting environments: Lam Son 719 (which included questions about what *really* happened to helicopters and fixed-wing planes there), defense against a Soviet attack in Europe, a Middle Eastern war, and a Korean war. From these premises, the questions addressed the three aircraft's specific capabilities, how they would fare against various threats in these warfighting environments, and the tactics and weapons they would use in these environments. Additionally, the questions addressed more meaty issues, such as how the various services conducted CAS in the different environments and how CAS was supposed to support the overall campaign. Finally, the questions required from the various services some indication of how they would use the other services' machine if their own craft were not approved.6

The result was predictable, and the body of the ensuing report revealed the problems Packard faced. In addition to the four theaters and dozens of specific questions, the study group identified six different CAS submissions and eleven different types of CAS targets, each of which invited creation of an aircraft optimally designed for one or a

what they did for ground troops. Bergerson thinks this was the Army's attempt to avoid any appearance of interservice competition on the eve of the Senate Close Air Support Hearings; however, the cancellation's timing is still curious.

<sup>&</sup>lt;sup>6</sup>Congress, Senate Hearings, <u>Close Air Support</u>, Appendix A (the Packard study group's report); and Bruce Nihart, "Packard Review Group: Roles and Missions to Remain Untouched, Aircraft Systems to Be Scrutinized," <u>AFJ</u> 109 (19 April 1971): 20, 39-40.

combination of several. The group also established twelve characteristics and key competitive factors, each of which presented its own interpretational problems. "Payload," for example, could be free-falling bombs, which all helicopters-including even Chevenne--had great difficulty delivering. Or it could be guided missiles such as the Maverick or TOW (Tube-launched, Optically aimed, Wire-guided anti-tank missile), which presented their own problems with target acquisition and guidance. "Responsiveness" could mean aircraft speed, which enabled a guicker trip to the battlefield. It could mean V/STOL characteristics, which allowed forward basing, and thus overlapped into the "Basing Flexibility" factor. Or it could mean simplicity of operation, which allowed more sorties over time, which in turn overlapped into the "Utilization Rate" factor. Packard considered the simply constructed A-X the most responsive plane, for though the Chevenne and Harrier possessed more basing flexibility with their V/STOL characteristics, they also were complex machines requiring more maintenance attention. Finally, Packard's group attempted a computer analysis of the machines' performance against a defended CAS target. The variables were so complicated that the group accepted a scenario featuring a lone aircraft attacking a single target with only one antiaircraft weapon defending it--a situation that the report admitted allowed no realistic conclusions.<sup>7</sup>

Thus, Packard's report dispensed with the question of which service should provide CAS because, not surprisingly, "*Close air support is a complex mission*" (italics in the original document). Indeed, the report stated that analyzing the relative merits of the three aircraft--not to mention those of other already operational attack aircraft--was task enough. It concluded that the A-X, Cheyenne, and Harrier should all be developed because each promised to deliver to its respective service unprecedented air support capability in ways specific to each service's needs. The A-X could operate from short fields nearer to ground forces than other Air Force jets; and its ruggedness, firepower, and loiter ability ensured

<sup>&</sup>lt;sup>7</sup>Congress, Senate Hearings, <u>Close Air Support</u>, Appendix A, 418-426, 431-36; Fredericksen, interview by author; and Pierre Sprey, interview by author. Fredericksen was responsible for land warfare and CAS issues in DDR&E at the time, and participated in writing the report. Though he and other staffers leaned toward the A-X, he recalled that the conclusion basically stated that the three aircraft "do different kinds of things."

that the Air Force provided heavy, sustained firepower support to the Army. Operating day or night in most weather conditions, the Cheyenne would be the most mobile and versatile direct fire support vehicle Army units had ever possessed. The Harrier well met the Marines' requirement for a tactical jet that could closely follow their amphibious operations. Likewise, each aircraft could not duplicate the other's strengths, designed as it was to maximize its own. The Cheyenne could operate in weather poor enough to ground an A-X, but the Cheyenne lacked the A-X's firepower, ruggedness, and loiter—and its complexity was a serious liability. The Harrier's V/STOL capability commanded a stiff price in weapons carriage capacity and loiter capability. Packard qualified his support for the three aircraft by requiring them to meet their cost and effectiveness goals. He also wanted flight tests of the fully developed A-X and Cheyenne to resolve any questions about specific strengths and weaknesses.<sup>8</sup>

Overall, the service representatives concurred with Packard, since he granted their respective aircraft a reprieve and averted interservice war. But as if to punctuate how strongly they believed that their particular machine fulfilled its service's specific air support mission, they filed addenda disputing certain of even these benign conclusions. General Momyer wanted only the A-X to be approved, since CAS was an Air Force mission and the A-X was the optimum plane. General Williams discounted the report's skepticism about the helicopter's ability to acquire targets versus fixed-wing planes. And the Marine Corps Commandant himself, General Leonard F. Chapman, Jr., insisted that the Marines could support Harrier units in the field, no matter how austere the surroundings.<sup>9</sup>

<sup>&</sup>lt;sup>8</sup>Congress, Senate Hearings, <u>Close Air Support</u>, Appendix A, 409-411. Apparently, determination of Lam Son helicopter loss rates was too much for the group, for the report does not even mention it. For the Harrier's performance penalties in exchange for V/STOL capability, see also Futrell. <u>Ideas</u>, vol. II, 520-521; and Ahmann, <u>McNickle</u>, 173.

<sup>&</sup>lt;sup>9</sup>Congress, Senate Hearings, <u>Close Air Support</u>, Appendix A, 411-413.

#### The Senate Tries to Solve the CAS Riddle

One could say, and at least one observer has intimated, that Packard and the generals intentionally created a report supporting the findings they wanted. The study's ultra-complex premises precluded a clear determination of which service would assume primary responsibility for the CAS mission and its attendant resources. It thus avoided a messy interservice fight with an unsatisfactory ending for all concerned, and instead allowed the services to continue their programs.<sup>10</sup>

The Packard group submitted its report in June 1971 as intended, but neither its conclusions nor its timing allayed the legislators' suspicions. Besides George Mahon and his House Appropriations Committee, the Senate Armed Services Committee also questioned the military about the issue throughout 1970. In March 1971, that committee's chairman, Senator John Stennis (D-MS), charged his Tactical Air Power Subcommittee to conduct hearings on the matter. Subcommittee Chairman Howard Cannon (D-NV), seemed confident that his committee members could resolve such matters, if the military was unable: "I feel reasonably certain in my own mind that when it gets down to the wire we are not going to be able to have a Cheyenne, an A-X, an A-7, a Harrier, and all of these other weapons... simply from an economic standpoint."<sup>11</sup>

<sup>&</sup>lt;sup>10</sup>Bergerson, 125-126, is the observer, and believes that Packard's study signified the Army helicopter men's transition from intraservice politics to big-time interservice allocation politics. Goldberg and Smith, 36-39, directly state that Packard and the generals were loath to start another interservice conflict.

<sup>&</sup>lt;sup>11</sup>Congress, Senate Hearings, <u>Close Air Support</u>, 104 (Cannon quote; Senators Barry Goldwater [R-AZ] and Stuart Symington [D-MO] made similar comments as Cannon in the hearings; see 32-33, 58-59, and 276); and Congress, Senate, Report of the Special Subcommittee on Close Air Support of the Preparedness Investigating Subcommittee of the Committee on Armed Services, <u>Close Air Support</u>, 92d Cong., 1st sess., 18 April 1972, 1 (states reasons for calling the hearings). The Senate Armed Services Committee's previous interest in the issue is from GAO, <u>Close Air Support</u>; <u>Principal Issues and Aircraft Choices</u>, 5-6 (committee's commentary on the FY 1971 budget); letter from David Packard to John Stennis, 11 September 1970; and letter from David Packard to Howard Cannon, 13 May 1970, AFHRC, MAFB; both letters AFHRC Holding K168.7094-38, 39. Packard's letters are his response to congressional queries and actions concerning the CAS aircraft, and contain his assertion that they are complementary

They should have known better. As Packard called for his study, Congress tasked the Government Accounting Office (GAO) to examine the mission and the aircraft that flew it. The GAO did not formally publish its report until after the hearings, and though its findings criticized the services' inability to create joint doctrine, it gave the impression that the mission's complexity and demands intimidated it as much as it did Packard and the generals. It even-handedly listed the strengths and weaknesses of the various candidates, and unintentionally made the military's point that the machines met certain needs. It also detailed the issues which made the mission so hard to address, and asked for better weapons testing to answer the tricky questions that they raised.<sup>12</sup>

and not competitive.

<sup>12</sup>GAO, <u>Close Air Support: Principal Issues and Aircraft Choices</u>, passim. The report's Appendices I and II (53-60) contain a short history of CAS mostly detailing the Air Force's neglect of it. Besides the GAO report, the early-1970s CAS plane controversy spurred other official reports whose histories became valuable sources for this work. Some of these are Air Force COL Robert Buhrow's Army War College study, "Close Air Support Requirements: A Study of Interservice Rivalry"; and Goldberg and Smith's RAND study, "Army-Air Force Relations: The Close Air Support Issue."

Buhrow wants better interservice coordination on missions like CAS (39-52). Goldberg and Smith see the 1971 controversy as a confluence of technological advance (helicopters), America's evolving world strategy (fighting conventional wars and not nuclear ones), and simmering interservice rivalries that are normally resolved in narrow terms instead of riskier overall terms (which allows avoidance of an "Admirals' Revolt" repeat). They believe that the Air Force at least appeared dilatory about serving Army needs; and that the Air Force in turn believed that the Army deliberately agreed to Air Force doctrinal preferences in order to create an aircraft "void" for Army helicopters to fill. Only by showing a keen interest in CAS can the Air Force retain its right to the mission, and the authors conclude by saying that both services will probably share the mission (39-50).

Tom Christie, interview by author, tells of delays encountered with the GAO study (he was on OSD's Joint Technical Coordinating Group and helped research these questions). GAO questions about weapons effectiveness created arguments between various military agencies about their favored weapons. The Army's Aberdeen BRL refused to cooperate with Christie's requests for vulnerability and weapons effectiveness questions concerning the Cheyenne.

Also in 1971, the Air Force conducted a study of future tactical air requirements and problems, called "TAC 85" (apparently either still classified, or lost, as all of the author's attempts to retrieve it failed). The study emphasized European war requirements The hearings opened on 22 October 1971 with Senator Cannon announcing that his subcommittee would work to resolve not only procurement questions but also the interservice roles-and-missions issue regarding CAS. His first witnesses were Packard and the Chairman of the Joint Chiefs of Staff, Admiral Thomas H. Moorer. Packard explained his report's conclusions and Moorer backed him, adding that the Navy did not buy only one type of ship for all of its missions. The senators spent the rest of the day following a winding path of questions revealing their ignorance of the various interservice agreements concerning CAS, the capabilities of the various aircraft, and how to apply CAS to different scenarios. Some senators on the subcommittee did know the details, but they backed their favorite service's interests. Former Air Force Secretary and current Senator Stuart Symington (D-MO) wanted the services to choose one of the CAS planes, but questioned the Cheyenne's viability and implied that the Marines' requirements to support their beach incursion warfighting style did not govern the Air Force and Army's needs. Senator Strom Thurmond (R-SC) revealed his pro-Army stance when he made the witnesses reiterate their support for the Army's attack helicopters.<sup>13</sup>

and revealed that there would be many airstrips, roads, etc., of around 4,000 feet length available, even after Soviet airfield attacks. This finding led to an upward revision of the A-X STOL requirement to a range between 1,000 and 4,000 feet; see Gunston, <u>Attack Aircraft</u>, 254-255.

<sup>&</sup>lt;sup>13</sup>Congress, Senate Hearings, <u>Close Air Support</u>, 1-55; and Congress, Senate Report, <u>Close Air Support</u>, 1-2 (gives Stennis' charter to Cannon). Symington's interests and opinions are on pp. 17-18, 27. Besides Symington, there were two other pro-Air Force members, Chairman Cannon and Senator Goldwater, who were both Air Force reserve officers (though Bergerson commends Cannon for allowing all sides their say; <u>The Army Gets an Air Force</u>, 126). ADM Moorer's Navy ships analogy is on p. 32, and is part of an exchange with Symington about choosing only one aircraft. Thurmond's interests can be seen on pp. 50-55. Thurmond had an Army background, and another pro-Army–or at least anti-Air Force--view in the hearings came via Senator Thomas McIntyre (D-NH). Don Fredericksen, interview by author, doubts that any of the key players in the 1971 CAS hearings ever read the entire Packard report. To the author, this means that everyone saw in it what he wanted to see, and serves as yet another example of the complex nature of this mission.

Following a day of briefings from witnesses about Soviet weapons in Europe, the senators called Army witnesses, all senior officers led by the helicopter advocate and Army Assistant Chief of Staff for Force Development, General Robert Williams. "Today, gentlemen, we are going to get down to the nitty-gritty of these close air support hearings. You in the Army are the primary users of close air support," Senator Cannon told them. Perhaps the senator was disappointed, for General Williams and the others supported Packard's findings. They praised Air Force air support in Vietnam, told the senators that the A-X and Cheyenne were complementary and not competitive, and refused one senator's suggestion that the Army assume sole control of CAS and its associated aircraft. They appreciated the heavier firepower and ruggedness of fixed wing planes, and thus wanted their helicopters to work with Air Force planes in the air support arena. General Williams explained that fixed-wing tactical aviation was not the Army's forté, and therefore the Air Force should fly fixed-wing CAS. But the witnesses adamantly supported their attack helicopters. They pointed out that though helicopters could not perform CAS while in the clouds, the craft could fly the mission in much poorer weather than even the A-X. They Army men played down their Lam Son losses, though the subcommittee pressed them on the issue. Also concerning tactical vulnerability, the senators wanted to know about recent helicopter tactical trials the Army had staged in Europe. The officers replied that they knew Europe was not Vietnam and had adjusted their attacks to handle the expected tougher defenses. Helicopters would not engage in one-on-one duels with air defenses, but instead would use the terrain to hide until they had a shot opportunity. This last item produced more questions, since the wire-guided TOW missile that served as the helicopters' prime antitank weapon required them to maintain line-of-sight with the target until missile impact. Again, the witnesses emphasized that they would use good tactics-decoys, suppression fires, and the like-to minimize risk.<sup>14</sup>

<sup>&</sup>lt;sup>14</sup>Congress, Senate, <u>Close Air Support</u>, 71-172 (one two-hour session, and one three-hour session, both on 28 October 1971). Cannon's quote is on p. 71. Page examples of testimony are as follows: Air Force air support praise, 75, 80-82 (GEN Williams resists Senator McIntyre's suggestion that the Air Force was unready for Vietnam CAS by saying that the service was as prepared as the Army; also praises A-1) 137; A-X and attack

The Army's time before the senators openly exposed their differences concerning this mission and their opinion of the various services. As Senator Thomas McIntyre (D-NH) pushed General Williams to admit to Air Force CAS unpreparedness in Vietnam and to accept all CAS aircraft into the Army, both Senators Cannon and Barry Goldwater (R-AZ) rebuked him in a somewhat heated exchange. "I hope you will stay and listen to all the hearings, so you won't make your decisions from a preconceived idea rather than from the testimony that is presented," Cannon chided McIntyre. Meanwhile, Senator Thurmond asked questions that allowed the Army men to sell their advanced attack helicopter. The senator was serious enough about Army helicopters that his dialogue with the witnesses produced twenty pages of hearings testimony.<sup>15</sup>

In his description of the hearings (<u>The Army Gets an Air Force</u>, 126-135), Bergerson claims that though the "Army appeared to bend over backward to accommodate both the Air Force and the Department of Defense" (128), it may have been to please a pro-Air Force subcommittee. He also believes that the Army may have agreed to Air Force priorities in order to create the operational void for helicopters that Goldberg and Smith describe. The author disagrees with Bergerson's pro-Air Force subcommittee description, for that body had its share of Army partisans. Additionally, Williams repeatedly stated in the hearings his desire that the Air Force continue to support the Army and its helicopter operations, something he repeated to the author in his 19 June 1997 telephonic interview (notes in author's possession). Further, BGEN John Bahnsen, who worked force development issues for aviation on the Army Pentagon staff in the late 1960s, confirmed the view in his interview with the author: "No way we were going to backwheel and let the Air Force get out of what they're supposed to do."

<sup>15</sup>Congress, Senate Hearings, <u>Close Air Support</u>, 80-84 (Cannon, Goldwater, and McIntyre exchange), 112-131 (Thurmond's questions).

helicopters are complementary weapons systems, 77, 85, 90, 101, 106, 123-125, 134; Army rejection of control of CAS, 85-86, 136; faith in helos and European helicopter tactics, 91, 114-119, 126, 128, 141-143, 156-157, 162, (cites Army study that claims A-X will be able to attack targets only at long ranges [greater than a mile away], which means that it cannot operate in bad weather--about the only time the Army officers "attacked" the other service with a spurious charge); helicopter's ability to operate in poor weather--especially Europe's poor weather, 102, 119, 131, 152-153, 160; and Lam Son losses explanation, 111, 121-122, 143-145. The Army men also stuck to their definition of helicopter CAS as something different, and thus termed it differently (155). For another account of the Army's work to adapt the attack helicopter to European anti-tank missions, see Bradin, 125-131.

The next day the Air Force sent only its TAC commander, General William Momyer, to deal with the senators. Momyer loved his service and was a dutiful soldier. Though he opposed the dedicated CAS plane concept, he followed his service superiors' desires and strongly presented its case to the panel. And if the Army officers accepted the Air Force position, Momyer certainly did not reciprocate. Defending his service's CAS performance, he dismissed the attack helicopter requirement by citing Army commander praise for Air Force CAS in every war since World War II. He criticized design flaws in both the Cheyenne and the Harrier. The Cheyenne was too expensive, carried a light ordnance load, and would survive in only benign threat environments--Lam Son 719 was proof of the latter claim. As for the Harrier, he believed that it paid too high a performance penalty for V/STOL capability; it might be fine for the Marines but it was not for the Air Force.<sup>16</sup>

<sup>&</sup>lt;sup>16</sup>One could accuse GEN Momyer of mendacity, or see his behavior as symptomatic of Air Force institutional rigidity, but he actually followed the officer's proper action concerning lawful orders. Officers may have honest differences about the best course of action in a specific case, and can privately express their reservations—but they obey and execute the ensuing decision. Both those who either agreed or disagreed with GEN Momyer's airpower beliefs said that his sense of purpose and military duty impressed them. These are GEN Jimmie V. Adams, USAF (ret.), telephonic (20 February 1997) and personal (29 April 1997, Arlington VA) interviews by author, recording and notes in author's possession (Adams worked in TAC staff in the early 1970s); Broughton, <u>Going Downtown</u>, 105-107, 265; Tom Christie, interview by author; Dick, <u>Disosway</u>, 162; Hasdorff, <u>Hildreth</u>, 32-34; <u>Sweat</u>, Oral History, 118-120; and MGEN Yudkin, USAF (ret.), interview by author. Others, such as Mrozek, 22-24, Tilford, 114, and to some extent, the author, believe that Momyer's consistent preference for high performance planes for all missions sometimes bred doctrinal rigidity.

Momyer's testimony is from Congress, Senate Hearings, <u>Close Air Support</u>, 29 October 1971, 173-249; his citation of Army commander CAS praise history is on 174-176, 185-187; and his criticisms of the Cheyenne and Harrier are on 183-184, 195-196, 220-221, 231-232, 245.

In a 1974 article, he repeated his criticism of the attack helicopter and Harrier; see GEN William Momyer, USAF, "Close Air Support in the USAF," <u>International Defense</u> <u>Review</u> (henceforth known as <u>IDR</u>) 7 (February 1974): 79.

In his personal interview with the author, GEN Momyer said that he told Chief of Staff Ryan before the hearings that he would support the A-X. But he also told Ryan that if the senators ever asked him for a personal opinion, he would not support it.

Concerning the Air Force's CAS machines, Momyer praised the A-X as the best CAS plane design, especially for Europe. He answered questions about European weather by saying that, if the pilot flew slowly enough, the plane could operate outside of clouds nearly all of the time. The A-X's gun and Maverick guided-missile allowed the plane to stand off from enemy defenses and hit the target--something that Momyer asserted the Cheyenne could not do. When the senators asked him why he could not accept the A-7 instead of the A-X, he told them that the A-X was the remedy to various A-7 CAS deficiencies. The A-X's high maneuverability allowed it to evade enemy fighters, whereas the faster A-7 could neither outrun nor outturn them. Also, the A-X was a more efficient CAS machine in every way. Its high-lift wing gave it better loiter capability, weapons carriage capacity, and field requirements. It cost less than an A-7.<sup>17</sup>

Reflecting his service's jealous solicitude for its mission prerogatives, Momyer stoutly asserted the Air Force's position as the nation's dedicated air service. He told the panel that the Army's attack helicopter development usurped the Air Force's CAS mission, and that the A-X was an answer to it. He pithily observed that the Army attack helicopter community probably would embark upon a path similar to that seen in the 1920s Air

<sup>&</sup>lt;sup>17</sup>Congress, Senate Hearings, <u>Close Air Support</u>, 213-214 (standoff capability), 214-217 (weather capability). Comparisons to A-7 due to frequent queries are from 179-182, 196, 201, 203, 207-208, 211 (A-7 not in Southeast Asia yet), 224, 227 (A-X evades fighters), 234 (A-X high-lift wing), 235-236 (cost comparisons), 240 (A-X loiter), 242 (A-7 lacks loiter). Momyer went on record for the A-10 in early 1974, as the A-10 faced a flyoff with the A-7. In his "Close Air Support in the USAF," <u>IDR</u>, 77-79, he wrote that the Soviet armored threat in Europe had overridden the Air Force's (and though he did not mention it, his own) preference for air-superiority planes that flew CAS as a side mission. The situation required a dedicated CAS plane, and the A-10 was optimally designed for it.

Concerning loiter and aircraft availability, the senators asked all of the services about the ability to support these aircraft in forward locations. Williams used these questions to favorably compare forward location logistics requirements for the helicopter with those of fixed-wing planes (129-130, 151, 159). Momyer admitted that forward base logistic support would be tough, and this was one reason why he liked the A-X's airborne loiter capability (211-213). Thus, his attitude matched that of the A-1 staff planners and Pierre Sprey. Momyer's claim that very slow speed (170 knots) helped in bad weather situations was somewhat disingenuous. The pilot had more time to handle oncoming terrain features, but his plane now lacked the speed energy to sustain hard maneuvering.
Corps: "I am sure that after Cheyenne--an Army aviator is no different than any other aviator; he is going to want to go faster; he is going to want to go farther; and he is going to want to carry more bomb load." Referring back to his command of all fixed-wing air units in Vietnam, he answered the panel's curiosity about the Marines' reputed CAS prowess by saying that they were no better at CAS than the Air Force. And to him, the Marines' desire to control their own air assets undermined a properly coordinated air campaign.<sup>18</sup>

Three days later there was a long session with Marine Corps and Navy officers, led by the Marines' Deputy Chief of Staff for Air, Major General Homer Hill. Cannon announced, "Some say the Marines have the finest close air support in the world. We will be anxious to discuss all aspects of this mission with you." With this mandate, the Marines wasted no time asserting that their amphibious mission required a plane like the Harrier. They agreed that it lacked payload and range, but unlike the Air Force men, they believed that airfield location determined responsiveness more than airborne loiter capability. This was because specific operational requirements demanded that the Marines administratively and geographically integrate their air units with the supported ground units. At this, the witnesses cited their World War II success as an example. Indeed, they were so keen on the Harrier that they deactivated some of their other air units to procure it. And in spite of repeated questions, they were confident that they could logistically support their operation via ships and helicopters. The senators also probed an issue that later figured in the Harrier's history, vulnerability to antiaircraft hits, but the Marines dismissed it because they believed the Harrier was fast enough to avoid ground fire. Concerning helicopters, they agreed with the Air Force that helicopters were too slow to be survivable in a

<sup>&</sup>lt;sup>18</sup>Congress, Senate Hearings, <u>Close Air Support</u>, 190 (quote), 208-210 (Momyer's assessment of the Marines), 220-223, 226 (Momyer's assertion of Army doctrinal turf invasion). In his interview with the author, GEN Robert Williams cited Momyer's testimony as an example of the Air Force's intention to kill Cheyenne. And in his Senate testimony, Momyer indicated that he understood that one underlying Army motive was that ground commanders wanted control of all of their resources.

high-threat environment, but like the Army witnesses, they wanted attack helicopters to better meet the varying conditions of CAS.<sup>19</sup>

Another part of the Marine/Navy session was a lengthy discussion of the A-7's merits. Impressed with the Air Force A-7's advanced fire-control system, the Navy started modifying its own A-7s to carry it, creating the A-7E. The Navy used the plane in Vietnam, and the witnesses included veteran A-7E pilots who strongly endorsed it. They thrilled the senators with accounts of the A-7E's weapons accuracy and loiter capability, citing FAC praise of its Lam Son 719 air support as proof. Furthermore, their use of the A-7E's ground mapping radar for medium-altitude (ten thousand to twenty thousand feet) night-time navigation offered the possibility that this plane was indeed the night/all-weather CAS plane that the Army wanted the Air Force to buy.<sup>20</sup>

<sup>20</sup>Congress, Senate, Hearings, <u>Close Air Support</u>, 307-322, 327-329. The Navy witnesses also claimed that the A-7E's 20 mm gun proved its anti-tank capability in Vietnam, and that it could defeat fighters like the F-4 in air-to-air combat. Their claims failed the panel's scrutiny, however. The gun only stripped the treads off of tanks, and the A-7E's ability to avoid defeat by fighters--not to mention in turn defeating them--depended upon the relative skills of the combatant pilots.

<sup>&</sup>lt;sup>19</sup>Tbid., 251-330 (testimony was in two sessions totalling over five hours). Specific sources from testimony are: 253-254, 283 (Marines mission creates aircraft requirements that match the Harrier, and no other aircraft); 255-256, 260, 273, 280, 288-290, 296-298 (Harrier does not need range because close basing matches response and close cooperation requirement better than airborne loiter prowess; World War II proof); 287 (Marines trade other units for Harrier); 275, 286, 295, (asserts Harrier is supportable, and cites British austere field operations as an example); 262, 303-306 (helicopter firepower and survivability limits effectiveness, but can work well in some situations and in coordination with fixed-wing; after all, CAS is very tactical/flexible mission; cites Vietnam proof); 258, 279, 299, 307-320 (vulnerability questions and answers). The panel asked what the Marines thought of the A-X, and the Marines answered simply that it might suit the Air Force but it was neither ship compatible nor VTOL capable (275). One of the Marine witnesses, COL Noah New, wrote an article that May advocating a mixed helicopter and fixed-wing air support force; see New, "Helicopter or Fixed-Wing? Both!" Marine Corps Gazette 55 (May 1971): 25-30. In his 1973 "Perspectives of Close Air Support" article for Marine Corps Gazette, New wrote, "The fundamental differences between helicopters and fixed wing aircraft are a scientific fact" (16).

The panel followed its aroused curiosity two days later when it questioned Air Force A-7 SPO staffers and tactical unit pilots about the plane. These officers confirmed the plane's weapons accuracy, loiter capability, and ensuing praise in Army CAS exercises (the Air Force had not yet deployed its A-7s to Vietnam). They also described their work with a FLIR apparatus that enabled them to navigate and deliver weapons from medium to high altitudes at night. However, they did not think that the radar, which could be used for dropping bombs in bad weather or night, was accurate enough for CAS. Significantly, they told the panel that the need for attack capability at low altitudes underneath the weather (and also in low visibility situations) still remained. Finally, they contradicted the Navy pilots' claim that the plane could defeat a fighter in air-to-air combat, and produced the test results to prove it.<sup>21</sup>

With the hearings nearly complete, the panel not only seemed undecided about the fates of A-X, Cheyenne, and Harrier, but now had virtually introduced a fourth candidate, the A-7. The plane's stellar fuel economy and weapons accuracy were two reasons, but other factors also played a role. Its development process was complete, whereas the A-X and Cheyenne required much more work. The senators also had more personal interests. Senator Goldwater admitted in testimony that one of the Air Force A-7 pilot witnesses was the son of a friend, and in a news article he said that he had changed his mind about the plane after watching a performance demonstration. A closer connection involved Senator John Tower, whose Texas constituency included the A-7's manufacturer, LTV. These hearings marked constituent politics' first significant public entry into the CAS plane story,

<sup>&</sup>lt;sup>21</sup>Congress, Senate, Hearings, <u>Close Air Support</u>, 3 November 1971, 331-364. FLIR briefing is on 334-340. The A-7 witnesses also said that the FLIR was good only clear of clouds (342, 348). Praise for the plane's characteristics is on 347-349, 352, 355-356, 358-360 (the latter pages feature praise in Army CAS exercises). Discussion of radar is on 351, 359. Doubt about air-to-air prowess is on 354, 363-364. The A-7 men admitted that the plane needed at least seven thousand feet of runway (358). The need for low altitude capability is on 348.

For other Air Force praise of the plane, see Harold Davis, "The A-7D Corsair II: Old Airplane in a New Package," <u>Army</u> 20 (July 1970): 20-21 (this was a sidebar piece by a SAF-OII staffer in an article by MAJ Rudolph Wacker, USAF [later, the first A-10 wing commander in Europe], explaining Vietnam CAS to <u>Army</u> readers).

as legislators jockeyed to ensure the best outcome for their client aircraft companies, and the associated voters' jobs. The Texas congressional delegation of the time was legendary for securing lucrative military contracts for its state. Tower was absent from the proceedings held so far. The exact reason is unknown, but perhaps it was because he did not want to be too closely associated with the increasingly pro-A-7 slant of the hearings.<sup>22</sup>

Indeed, the issue of Texas political influence on military procurement, as well as the political angles behind the CAS plane debate, came on the hearings' last day. Senator William Proxmire (D-WI) appeared as a witness to influence the panel's decisions on behalf of the Members of Congress for Peace through Law (MCPL). MCPL consisted of liberals from both parties who opposed defense spending and the U.S.-Soviet arms race. Proxmire represented them apparently due to his recent success in leading the effort to stop funding the supersonic transport (SST); but if he thought his charisma would solve the

<sup>&</sup>lt;sup>22</sup>Congress, Senate, Hearings, <u>Close Air Support</u>, 1, 71, 173, 251, 312, 320, 331, 474 (pages relate to hearing attendance and Goldwater's relationship with and opinion of A-7). Goldwater liked the A-7 so much he inserted George Weiss' favorable article, "They Call It 'SLUF'-Short Little Ugly Feller--or Something Like That," <u>Armed Forces Journal</u> (December 1971) as Appendix D of the hearings record (which contains the story of his conversion to supporting the plane).

Texas' interest in, and organized political clout for, military contracts has many sources: Anthony Battista, personal interview by author, 30 April 1997, Fredericksburg, VA, recording and notes in author's possession (Battista was a renowned House and Senate staffer for military procurement affairs); Coulam, Illusions of Choice, 63 (cites Vice President Lyndon Johnson's alleged influence in securing the TFX [F-111] contract for Texas-based General Dynamics); Dörfer, Arms Deal, 42; Robert Giaimo, telephonic interview by author, 12 March 1997, notes in author's possession (Giaimo served in the House [D-CT]); Gunston, Attack Aircraft, 247, 269; Hadley, Straw Giant, 154-155; George Mahon, interview by Kent Hance, c. 1980, interview 00048, transcript, Southwest Collection, Texas Tech University, Lubbock, TX, 29-30 (Mahon recalls that when he first came to Congress, senior Texas congressmen steered him to the most important committees); LTGEN Thomas McMullen, USAF (ret.), personal interview by author, 5 May 1997, Alexandria, Va., recording and notes in author's possession (McMullen ran the A-10 SPO in the early 1970s); Morton Mintz, "The Maverick Missile: If At First You Don't Succeed . . . A Case Study of Defense Procurement Problems," The Washington Post (23 February 1982, start of article series), reproduced in More Bucks, Less Bang, ed. Rasor, 183; Otis Pike, interview by author; Robert Price, telephonic interview by author, 12 March 1997, recording and notes in author's possession (Price served in the House during this time [R-TX]); and Robert Seamans, interview by author.

CAS plane question, he erred as much as the panel members. The MCPL's report to the panel praised the A-X as the most economical choice while condemning the other designs, but its argument contained faults. For example, it dismissed the much closer physical and organizational connection between attack helicopters and the Army units they supported. Proxmire's testimony also contained errors and assertions that sparked more argument. The Air Force wanted to increase its authorized tactical wings to accommodate the A-X, but Proxmire wanted to reduce the service's force structure *and* buy the plane. The reason, as revealed in arguments with Senators Cannon and Thurmond, was that CAS yielded tangible results compared to other missions, and A-X was the most efficient CAS machine. CAS was important, but it required both air superiority to reduce the enemy air threat and interdiction (well planned) to constrict enemy reinforcements. His argument recalled the McNamara Whiz Kids' economic infatuation and occasional lack of good tactical sense.<sup>23</sup>

Proxmire's most volatile testimony came with his attacks upon the A-7 and the Texas congressional delegation. He noted in his opening remarks that though the MCPL report did not address the A-7, recent developments in the hearings required him to criticize this plane's faults as well. Accordingly, he repeated many of General Momyer's reasons for why the A-X was a better CAS plane. Concerning the Texans, Proxmire detailed the political fortunes of the Texas-produced F-111 and how Texas-based LTV needed more A-7 orders to keep its people employed. This inspired Senator Tower--who certainly appeared at this session--to sharply demand that Proxmire elaborate upon his charges. In response, Proxmire played coy, telling Tower that "I think you probably know a great deal more about that than I do for a number of reasons. First, you are on this committee, and second, you are from Texas." Tower reminded Proxmire that Texas aviation companies had lost several recent contract competitions, and then directly asked, "But what I want to establish is whether or not you are accusing certain of us here on the committee of bringing political pressure to keep the production line open?" To this, the

<sup>&</sup>lt;sup>23</sup>Congress, Senate Hearings, <u>Close Air Support</u>, 365-377, 386, 388, and Appendix B (the MCPL report and member roster). The MCPL's specific recommendation for the three planes was that the A-X be procured, while the Cheyenne should only be retained as a prototype, and the Harrier be accepted in smaller numbers than requested.

acclaimed fearless crusader against government fraud and waste replied, "Certainly not." Tower crossed up Proxmire in his own logic by demonstrating that the Wisconsin senator had his own favorite expensive weapons, such as submarines. As a parting shot at Proxmire, the panel not only inserted the MCPL report but two <u>Armed Forces Journal</u> articles charging Proxmire and MCPL with hypocrisy.<sup>24</sup>

Thus the hearings that convened to resolve not only aircraft choices but also overall CAS issues ended in indecision and acrimony. One interesting item about both the studies

Schemmer does not like the MCPL report because of its anti-attack helicopter bent, and argues with the report's helicopter casualty statistics. He also scouts the report for using poor logic and research overall, and its asserted claim that amphibious operations were obsolete is one example. And though Schemmer does not mention Pierre Sprey by name, he cites the activities of a certain former OSD analyst, current consultant, and acclaimed "father of the A-X" (p. 466). Sprey had apparently generated papers used by MCPL to criticize helicopters and praise the A-X. Schemmer cites other Sprey papers goading defense officials to ensure that the A-X's gun perform to standards as evidence that A-X had its own problems. Sprey did not specifically mention MCPL to the author, but did say that he wrote papers on roles-and-missions issues during 1971. These asserted that the A-X's competitors "weren't close air support planes." Proxmire and MCPL's assertions about CAS' importance agrees with Sprey's opinion.

<sup>&</sup>lt;sup>24</sup>Ibid., 372-373 (Proxmire did not mind a flyoff between the A-X and A-7), 379 (Cannon questions Proxmire's charge that the panel recommended cancellation of the A-X in favor of the A-7, and Proxmire answers that he "hypothesized" the charge), 399-400 (quotes and Tower-Proxmire fireworks). The critical <u>AFJ</u> pieces are Weiss' "They Call It SLUF," which contains a subsection entitled "A-X's Strange Bedfellow: Senator William Proxmire Debuts in New Role as Super Airplane Salesman"; and Benjamin Schemmer, "Bum Dope and a Stacked Deck on Close Air Support," (October 1971), reprinted Senate Hearings, <u>Close Air Support</u>, Appendix C, 465-468.

Weiss contrasts Proxmire's frequent demands for specifics from military people in other hearings to his occasionally vague presentation before the panel. Weiss also charges Proxmire with political grandstanding, as evidenced by some of his other senatorial actions. But if Proxmire hoped to garner more press attention, he failed at this as well. Besides articles in the defense press, none of the major American news sources—<u>The New York Times, The Washington Post, Time, Newsweek</u>, etc.—covered the story. Perhaps this was because they knew that this issue would probably confuse the lay public, and that it involved relatively low-cost weapons. According to Congress, Senate Report, <u>Close Air Support</u>, 12, 21-24, the most expensive CAS aircraft contestant cost \$3.8 million per copy. This paled in comparison to such planes as the B-1 and C-5, which generated so much media and public attention at the time; see William O'Neill, <u>Coming Apart: An Informal History of America in the 1960s</u> (Chicago, III.: Quadrangle Books, 1971), 410-412.

and hearings was that no one questioned the need for CAS, regardless of the difficulties involved in understanding and accomplishing it as a mission. Indeed, every military leader, OSD official, and senator--including Proxmire--wanted the American soldier to receive the best possible CAS. With that premise established, it should have surprised no one that the services won their case to prevent cancellation of their respective machine, which each believed best accomplished CAS as determined by its own history and ensuing war doctrine. The senators seemed befuddled by the varying capabilities, mission definitions, and service agreements. A couple of them qualified their initial bluster about choosing only one machine and accepted that at least two might be fine. Others took sides, which almost guaranteed the CAS machines' survival.<sup>25</sup>

The ensuing April 1972 hearings report reflected the problems. It reaffirmed the senators' support for the best CAS possible, cancelled none of the programs, and as with Packard's report, wanted further development and testing of all of the aircraft. There were some differences in how this should proceed, however. The senators liked the A-X's competitive prototype development process enough that they wanted to see what the winner looked like. But reflecting their newfound interest in the A-7, they wanted the A-X winner to then compete against it in another flyoff. Perhaps reflecting the senators' awareness that the Army would soon completely cancel the Cheyenne contract--which it did in August--the report's conclusions did not mention Cheyenne by name. Instead, it only stated that there was a "valid requirement for a more capable attack helicopter, provided the questions regarding helicopter vulnerability are resolved successfully." As for the Harrier, the panel recommended no more purchases pending operational evaluation. Finally, the report conceded that the mission and its planes were hard to analyze, and as if to underscore this, it contained addenda by dissenting senators just as Packard's report

<sup>&</sup>lt;sup>25</sup>For a sampling of the hearings' advocacy of air support for ground troops, see Congress, House, <u>Close Air Support</u>, 11, 71-72, 83, 90-95, 105 (Air Force reserve officer Goldwater supports Army, and admits the panel may choose more than one aircraft), 112-114 (Senator Thurmond-GEN Williams colloquy about Army's agreement with Air Force on air mission priorities, and both men's admitted confusion on whether a plane optimized for interdiction can do CAS as well), 134, 137, 174, 185-187, 251, 276.

featured military dissent. Senator Symington objected to the A-7 provisions. Senator Harold Hughes (D-IA), a subcommittee member who did not attend the hearings, demanded that the "Army's right to provide close air support should be protected." Senator Goldwater asserted that the Air Force held the sole right to perform CAS. Senators Thurmond and Tower believed that a valid need existed for all of the planes, with Thurmond objecting to claims that the machines duplicated each other and Tower pointing out that the British had already proved Harrier's worth. (Tower did not push the A-7, but then, he did not need to.) With this rancorous sendoff, the Air Force CAS plane proceeded to the next trial.<sup>26</sup>

### The CAS Plane Candidates Compete

Meanwhile, the two companies continued building their candidate planes, and by spring 1972, had actually flown their respective prototypes. The two aircraft were similar in many ways, especially where they followed the government's requirements for

Symington's complaint appeared in one line at the bottom of text in the report (25), but George Weiss, in his article "They Call It 'SLUF," quoted Symington's protest that the A-7 was a plane the Navy foisted on the Air Force in order to reduce unit costs. Weiss noted that Symington had no problems with another Navy plane that the Air Force procured, the F-4, apparently because McDonnell-Douglas built it in Symington's state, Missouri. The author believes that, as a former Air Force Secretary and current congressional Air Force advocate, Symington followed his client service's wishes.

The Cheyenne's demise is in Bergerson, 140; Bradin, 124; and Futrell, <u>Ideas</u>, vol. II, 527. The reasons for its end have been discussed, though Bradin observes that once it ran into serious problems, opponents "gathered to peck it to death." Futrell writes that the cancellation occurred because Cheyenne could not compete with the Cobra cost wise, and also lost a flyoff to its upgraded version, the King Cobra, in 1972. The Harrier passed its evaluations and continued in service; see Gunston, <u>Attack Aircraft</u>, 99-100, 104-105; and New, "Perspectives," 17-19.

<sup>&</sup>lt;sup>26</sup>Congress, Senate Report, <u>Close Air Support</u>, 2-3 and 25-26 (conclusions and recommendations, quote about Army helicopter recommendation); 5-6 (summary of Packard report); 7-9 (discussion of varying CAS philosophies and CAS' importance to soldiers); and 21-24 (summary of aircraft); 27 (Hughes' quote); 28-29 (Goldwater dissent); and 30-36 (Thurmond and Tower dissent). Actually, the report recommended a flyoff between the A-7, A-10, *and* the A-4. It also identified factors that the senators believed influenced the current controversy: interservice agreements that could not address all of the contingencies, especially the appearance of the armed helicopter (15-16).

survivability features. Both featured redundant flight control hydraulic systems, blow-out panels, interchangeable parts (between each side of the plane, an uncommon feature for many aircraft at that time), protected fuel tanks, an armored cockpit "tub" protecting the pilot, and a manual (non-hydraulic boosted) backup flight control system. Their cockpits were roomy and had large, bubble canopies to allow the pilot unhindered visibility. Both planes carried only basic radios and navigation systems, reflecting the desire for simplicity and low cost. They were also built to accommodate the 30 mm gun then under initial development, and they used as many "off-the-shelf" items as possible. The companies themselves were somewhat similar, in that both had experienced mixed fortunes working with the Air Force. Fairchild-Republic's (henceforth referred to as Fairchild) last successful effort was the F-105, while Northrop had more recently built the F-5.<sup>27</sup>

There also were differences. Northrop's A-9 (for photo, see Appendix Fig. 35) was the more conventional design, with two engines mounted within the fuselage like nearly all tactical jets. The engines and intakes were low to the ground because Northrop's designers wanted them placed at a height that allowed easy maintenance access. It weighed slightly less than its rival, Fairchild's A-10, but its engines, Lycoming F102 turbofans, produced nearly one-fourth less thrust per engine than the A-10's General Electric TF34s. In order to meet the government's loiter, short field performance, and maneuverability specifications, Northrop had to offset the lack of thrust by extending the span of its thinner wings. It also had a selectable flight control subsystem that was supposed to allow the pilot to smoothly fine tune his target run-in alignment with his rudders (normally, this technique induced unwanted rolling motion on many jets).<sup>28</sup>

<sup>&</sup>lt;sup>27</sup>Bright, <u>The Jet Makers</u>, 189-191; Woods Hansen, ""A-10 Prototype Ready for Production," <u>AW&ST</u> 96 (26 June 1972): 114-118; "Northrop Streamlines A-9A Management," <u>AW&ST</u> 96 (26 June 1972): 107-113; George Watson, "The A-10 Close Air Support Aircraft, 1970-1976" (Wright-Patterson AFB, Ohio [henceforth, this location shall be referred to as WPAFB]): Office of History, Headquarters Air Force Systems Command [HQ/AFSC], n.d.), 13-19, 22. The A-9 and A-10's first flight was 30 May 1972 and 10 May 1972, respectively.

<sup>&</sup>lt;sup>28</sup>Gunston, <u>Attack Aircraft</u>, 263-264; "Northrop Streamlines A-9A Management," 107-113; and Watson, "Close Air Support Aircraft," 13-16. The A-9's maximum weight

The A-10 (for photos, see Appendix Figs. 36-38), on the other hand, had an unconventional design. It had a twin tail and its two engines sat separately atop the fuselage just aft of midway between the plane's nose and tail. The twin tail provided obvious control redundancy, and Fairchild engineers asserted that the engine setup prevented one engine's catastrophic failure from affecting either the other engine or other fuselage components. Though the engines sat high above ground, they required none of the extensive effort of access or extraction required for extensive repair or replacement of engines placed within the fuselage. They also had less chance of experiencing foreign object damage (FOD) from objects sucked up by the intakes or thrown up from the ground. In striving for maximum efficiency in weight and cost, Fairchild-Republic's designers rejected fully recessed landing gear bays, which increased aircraft weight and size, in favor of wing pods that only partially concealed the gear. The wing was thicker than that of the A-9, in order to better meet the CAS performance guidelines set forth in the RFP. It also sat low on the fuselage but curved upward toward its tips to provide better control response and stable handling. The A-10's wing and engine design allowed more weapons carriage pylons to be installed underneath its wing and fuselage. Finally, the plane had no sophisticated autopilot system for weapons delivery.<sup>29</sup>

was 41,000 pounds while the A-10's maximum was nearly 45,600 pounds. The F102 fan developed 7,500 pounds of thrust and the TF34 generated 9,275 pounds of thrust. The A-9's dimensions were 58 feet wingspan, 54 feet length, and 16 feet height. The A-10's dimensions were 57 feet wingspan, 53 feet length, and nearly 15 feet height.

<sup>&</sup>lt;sup>29</sup>Gunston, <u>Attack Aircraft</u>, 264-265; Hansen, "A-10 Prototype," 114-118; Robert Sanator, telephonic interview by author, 16 May 1997, notes (interviewee requested no recording) in author's possession. (From 1969 through 1973, Sanator was the manager of Fairchild-Republic's A-10 preliminary design team; the chief designer, Vincent Tizio, is deceased) Sprey, interview by author; Sweetman, "Structure" and "Powerplant," chaps. in his <u>Modern Fighting Aircraft: A-10</u>, 16-27, and 28-33; and Watson, "Close Air Support Aircraft," 16-19. Sanator told the author that the designers' intention for the wing to deliver the RFP performance specifications—and the design-to-cost restrictions—drove the plane's performance.

A simplified explanation of wing positioning and shape versus aircraft handling follows. The fuselage sits beneath a high wing and serves as a stabilizing counterweight to the wing's aerodynamic forces; thus, a high-wing plane is normally quite stable but less

The flyoff occurred at the Air Force's famed high-desert test facility at Edwards Air Force Base, California, between October and December 1972. When the competition commenced, both aircraft had flown over 150 hours, which allowed both companies adequate time to prepare. This also allowed the Edwards test pilots time to familiarize themselves with both planes, for the test featured the same pilots flying both planes in order to gain a better comparative assessment. Each plane flew approximately 140 hours in profiles that not only tested weapons delivery suitability (though the planes had to use a 20 mm cannon because the 30 mm gun was not ready), but also handling characteristics and cockpit features. Though one observer later criticized the test for lacking such tactically realistic items as simulated air defenses, even he conceded that time and cost constraints did not allow this. He also admitted that it was still a "very stringent" competitive test of aircraft at this stage of their development. The test planners designed the flyoff to accentuate the differences between the planes, and all observers noted that it did just that. Even though the planes did not actually fly against air defenses, one of the flyoff's tests involved taking sections of each plane, such as engines, fuel cells, and wings, to Wright-Patterson Air Force Base, Ohio, and firing actual Soviet 23 mm rounds at them in a wind tunnel. This "unprecedented" test action was the best simulation, short of actual combat, of how durable each aircraft's components were when hit by AAA in flight.<sup>30</sup>

<sup>30</sup>MAJ Roy Bridges, USAF, "Realism in Operational Test and Evaluation for Close Air Support," Research Study (MAFB: Air Command and Staff College, 1976): 28-35 ("stringent" quote, 30); Clarence Robinson, "A-10A Future Keyed to Gun Development," <u>AW&ST</u> (29 January 1973): 16-17; "History of Air Force Systems Command, FY 73," (WPAFB: HQ/AFSC, n.d.), 195-202; Sweetman, <u>Modern Fighting Aircraft</u>, 11-12 ("unprecedented" quote, 11); and Watson, "Close Air Support Aircraft," 22-23. Pierre Sprey told the author that Air Force Systems Command (AFSC), which oversees the Edwards testing, initially balked at the idea of using the same pilots for flying both aircraft: "As if they didn't ever have pilots that could fly two airplanes at once." The organizational setup for this test was called the "Joint Test Force," since it included personnel from outside AFSC. Of the seven test pilots who participated in the flyoff, two were from TAC.

responsive to the pilot's roll inputs. The fuselage is less of a counterforce to a low wing, creating the opposite effect. If the designers want compromise performance with the low wing, they can curve it upward toward its tips. This allows the fuselage to sit at the bottom of the wing's arc and provide a more stabilizing influence.

The weapons results were nearly even, with the A-9 slightly more successful in forty-five degree dive deliveries and the A-10 performing better in fifteen-degree dive deliveries. Test personnel cited the A-9's strong features, which included cockpit visibility, maintainability, and weapons accuracy. However, the A-9's rudder input adjustment feature encountered problems, and test pilots found that rudder forces were unacceptably high during manual (hydraulic systems out) flight. The A-10 scored well for similar reasons, but criticisms were different. These addressed items that later caused some problem in the program, such as engine performance difficulties encountered due to the engines' position on the plane.<sup>31</sup>

The DSARC reviewed the results in January 1973 and chose the A-10. Secretary Seamans said that the A-10 won due to its ease of maintenance, ordnance carrying capacity, simplicity, and more complete development. These latter two items were important to the A-X program meeting its design-to-cost goals. Dr. Foster added that the test pilots generally chose the A-10 as the plane that they would most like to fly in combat. Additionally, the A-10--or at least its parts-fared better in the survivability testing. Through February and March, the DSARC's recommendation received approval by senior OSD officials with their stipulation that the plane must meet its cost and performance goals. Specifically, they allowed further development but not full-scale production, and paid Fairchild enough money to build ten prototypes which would be used for

The pilots encountered problems with both aircraft during the checkout and early testing. One pilot ran his A-10 off the runway on landing rollout and collapsed its gear. There was a gravity stress ("G") limit on both planes, and the pilots routinely overstressed the A-9 during dive-bomb pullouts until Northrop engineers modified its too-sensitive pitch control authority. The A-10's engine performance problems—the engines surged during high angles of attack (the angle between the aircraft and the relative wind)—were rectified shortly after the flyoff. For these details, see COL Edsel Field, USAF, "A-10 Test and Evaluation: A Case Study," (MAFB: Air War College, 1976), 56-61.

Packard's Close Air Support Review Group actually made the recommendation for the 23 mm firing as part of its overall desire for more testing; see DCP 23B, 5, 15.

<sup>&</sup>lt;sup>31</sup>Sweetman, 11-12; Sprey, interview by author; and Watson, "Close Air Support Aircraft," 23-24. Sprey said that Northrop's decision to incorporate the rudder sideslip system hurt it in the test.

developmental milestone tests. Deputy Secretary of Defense Packard revealed the military's cost-consciousness when he ordered, "I expect the Air Force to thoroughly review the design and eliminate any features not absolutely necessary for the accomplishment of the close air support mission."<sup>32</sup>

Both at the time and later, some observers either asserted or surmised that the A-10's flyoff victory was largely political. Two aviation history authors, Bill Gunston and Bill Sweetman, built a case for this. To them, the flyoff was too even, and thus the question became which aircraft company could best stand contract rejection. Long Island, New York-based Fairchild had not had a successful military contract in some time, and was still smarting from the recent SST cancellation, for which it was the largest single subcontractor. Another rejection could possibly mean unemployment for many New Yorkers, while California-based Northrop was in better financial shape. The Air Force allegedly accepted the A-10 because it did not want heat from the politically powerful New York delegation and because the government did not want to see an established military aircraft maker go defunct.<sup>33</sup>

<sup>&</sup>lt;sup>32</sup>"History of Air Force Systems Command, FY73," 202 (quote); Seamans, <u>Aiming at Targets</u>, 175; Sweetman, 11-12; Sprey, interview by author; and Watson, "Close Air Support Aircraft," 24-29. Seamans recalls that the A-10's engine setup promoted maintainability. Good descriptions of the A-10's survivability features are Smallwood, <u>Warthog</u>, 13-17 (Smallwood also mentions the turbofan engines, which had a lower heat signature); Sweetman, "Structure," chap. in his <u>A-10</u>, 16-27; and Wilson, "Fairchild A-10," <u>Flight International</u>, 710-715.

<sup>&</sup>lt;sup>33</sup>Gunston, <u>Attack Aircraft</u>, 265; and Sweetman, 11. Sweetman cites Gunston's work in his own, but adds other information, such as the failed SST bid. Gunston mentions that Fairchild-Republic was one of the rejected companies in the F-15 contract competition. Sweetman also writes that another Long Island aircraft maker, Grumman, had troubles with its F-14 Navy fighter during this time, which further spurred the New York delegation's push for the A-10. James Stevenson, in his <u>The Pentagon Paradox</u> (history which focuses upon 1970s fighter procurement in general, and upon the F/A-18 buy in particular), 151-152, mentions a nasty contract squabble between the Navy and Grumman that lasted from December 1972 to March 1973. This timeframe encompasses the A-10 decision, but since Stevenson also asserts that the Navy and many non-New York congressmen truly wanted F-14s (60-61, 153-157), the author questions the seriousness of Grumman's predicament.

However, people close to the issue assert that the result was based upon the planes' relative merits. The Air Force Secretary at that time, Robert Seamans, later told this author, "I can assure you it was not political." He added that Senator Lowell Weicker (R-CT), in whose state the A-9's Lycoming engines were manufactured, accused the Air Force of bowing to political pressure from New York and Maryland (another state with a Fairchild facility). Seamans arranged a special briefing to show Weicker why the A-10 was the better plane. Weicker remained unconvinced, and told Seamans and the other briefing attendees that the A-10 won on the "strength of Agnew and Rockefeller," or words to that effect (Vice President Spiro Agnew was from Maryland and Nelson Rockefeller was Governor of New York). Seamans told the author that Weicker's behavior left him "apoplectic with rage," and that he immediately left the room. One New York and California were equally matched in political clout; perhaps, one could add, even more than the respective planes. In such a case, the decision would then fall back to the planes' relative merits.<sup>34</sup>

Everyone admitted that the finish was close, but added that the A-10 had certain unmistakable advantages. For one thing, it more closely matched the CFP's desire for widely separated engines. In this vein, Air Force leaders claimed in later congressional testimony that its high-placed engines better improved its chances of avoiding FOD when operating on rough fields. Furthermore, the A-10's TF34 engines were more powerful than those in the A-9, and were also a proven design. Service leaders also stated that the A-10 was better designed to receive the 30 mm gun, and the plane's low wing setup allowed comparatively ample space for weapons carriage. As one of Fairchild's design executives, Robert Sanator, put it: "We literally sat down and designed a plane around the

<sup>&</sup>lt;sup>34</sup>Fredericksen, interview by author (feels that the A-10 won on its ruggedness and maintainability, and not on politics; Fredericksen was still at DDR&E at the time); Pike, interview by author; Craig Powell, "A-10 Source Selection," <u>Government Executive</u> 5 (November 1973): 17 (cites Senator Abraham Ribicoff's [D-CT] questions about the outcome; apparently Connecticut's representatives were more upset about Northrop's loss than those from California, perhaps because Lycoming could ill-afford it); Seamans, <u>Aiming at Targets</u>, 175; and Seamans, interview by author (all quotes).

gun that we had to have." Its more advanced state of development, as well as its greater simplicity and maintainability, were most important to government officials anxious about the cost constraints they faced. They said the A-9's underwing engine placement restricted the amount of ordnance it could carry; also, the engines were more closely placed to each other, and their intakes were close to the ground. Additionally, its 30 mm gun bay did not allow as easy access than that of the A-10. The A-9 was too complex, even in its simple prototype state, and labored under too many questions about its future development and associated costs. The test pilots also liked the A-10, and its survivability features stood out in realistic testing. Concerning the latter item, TAC would later boast that the plane could lose one engine, half of one tail, two-thirds of one wing, and assorted parts of the fuselage--and still fly!<sup>35</sup>

<sup>&</sup>lt;sup>35</sup>The other sources are Air Force Deputy Chief of Staff for Research and Development, LTGEN William Evans, testimony in Congress, House, Hearings before a Subcommittee of the Committee on Appropriations, DoD Appropriations for 1974, Part 6, 93d Cong., 1st sess., 19 September 1973, 1351; John Brindley, "Fairchild's A-10 Is Entering Service: The Return of the Flying Can-Opener," Interavia 31 (November 1976): 1089-1090 (A-10 design and survivability features); "The Fairchild Can-Opener: Shturmovik of the Eighties," Air International 16 (June 1979): 267-272, 282 (nice description of A-10's background and features; features TAC boast on p. 271); Fredericksen, interview by author; COL Sam Kishline, interview by author (served in A-X SPO); Minutes, DSARC Review of A-X Aircraft-Milestone II, 17 January 1973, 5-6, supporting documents; Clarence Robinson, "USAF Unveils War Game Study to Blunt A-10 Contract Attacks," AW&ST 98 (5 March 1973): 14 (Connecticut senators call for an investigation); Air Force Chief of Staff, GEN John Ryan, testimony in Congress, Senate, Hearings before a Subcommittee of the Committee on Appropriations, Department of Defense Appropriations for Fiscal Year 1974, Part 4, 93d Cong., 1st sess., 2 April 1973, 68-69; Clarence Robinson, Jr., "A-10A Future Keyed to Gun Development," AW&ST 99 (29 January 1973): 17 (A-9's gun fitting difficulties); Sprey, interview by author (believes that the test was fairly run); Smallwood, Warthog, 12-19 (good basic description of A-10's gun and survivability features; quote, 12); Sweetman, 11-12; Watson, "Close Air Support Aircraft," 24-26; and Michael Wilson, "Fairchild A-10," Flight International 109 (20 March 1976): 709, 707-717 (A-10 and TF34 features). Kishline told the author that the A-9 was too complex to meet the rigid design-to-cost goals. The Milestone II meeting was held to select the flyoff winner. Its minutes noted that the attendees liked the A-10's simplicity and maintainability; it also noted that the test pilots preferred the A-10 for combat. Even Sweetman concedes that the A-10's cost-efficiency and survivability features surpassed those of the A-9.

# Congress and Combat Again Intervene

There was still the matter of a contest between the A-X flyoff winner and the A-7, and Congress pointedly reminded Air Force leaders about it throughout 1973. Service leaders told the congressmen that the A-10 was not yet fully developed enough to make the flyoff meaningful, and instead offered up three studies, called SABER ARMOR ALPHA, BRAVO, and CHARLIE, which it said showed that the A-10 was a better plane than the A-7 in nearly all categories. Since the Air Force seemed reluctant to comply, the legislators played rough. In late August, they cut the service's A-10 prototype buy from ten planes to six and reduced development funding for the plane. Funds would be released pending the results of the A-7 versus A-10 flight test. The service, fearing Congress' outright cancellation of the A-10 program, was actively setting up test rules and creating a test plan by October.<sup>36</sup>

<sup>&</sup>lt;sup>36</sup>"A-10/A-7 Flyoff Rules Drafted, Await Defense Chief's Approval," 99 <u>AW&ST</u> (15 October 1973): 23; "A-7D, A-10 Fly-Off Suggested," Air Force Times (15 August 1973): 29; Bridges, "Realism in Operational Test," 37-38 (believes that the Air Force opposed the test due to the following: limited resources that prevented a truly meaningful comparison, and flying an undeveloped prototype against a combat-proven plane was unfair); Cecil Brownlow, "Senate Unit Presses A-7/A-10 Flyoff," 99 AW&ST (20 August 1973): 18-19; Futrell, Ideas, vol. II, 527-529; J. Phillip Geddes, "The A-10--USAF Choice for the Close Air Support Role," IDR 7 (January 1974): 76 (besides recounting Air Force resistance to the flyoff, it is also an extensive description of the plane, and focuses upon the four characteristics-responsiveness, lethality, simplicity, and survivability--that guided its design); Clarence Gieger, and others, "History of the Aeronautical Systems Division, July 1973-June 1974," vol. L (WPAFB: History Office, Aeronautical Systems Division, n.d.), 80-84; Minutes, DSARC Milestone II, 7, supporting documents (in this January 1973 meeting, the members discuss Congress' flyoff desires, resolve to be responsive, but believe that they have the information Congress needs to make a decision); Powell, "A-10 Source Selection," 15-17 (good summary history of CAS issues, procurement issues, procurement politics, and the relative merits of the A-7 and A-10-cites Fairchild-Republic President' Ed Uhl's and the Air Force's assertion that the A-10 is the plane for CAS); "Senate Unit Cuts A-10A Funds; Recommends Flyoff with A-7D," AW&ST 99 (23 July 1973): 22; "USAF Agrees to Flyoff for A-10, A-7D," 99 AW&ST (1 October 1973): 22-23; "Washington Roundup: Strike Delay," AW&ST 98 (19 February 1973): 71 (George Mahon asks OSD to delay signing contract with Fairchild); and Watson, "Close Air Support Aircraft," 38-40.

Sources for the SABER ARMOR studies are Congress, House, Committee on Armed Services, <u>Hearings on Cost Escalation in Defense Contracts and Military Posture</u>

Beyond the fact that the Senate's CAS hearing report demanded it, other items spurred Congress' brusque action and sustained its interest. Budget concerns still drove skepticism, in spite of the Senate's post-CAS hearings go-ahead to develop the various aircraft (and in a preview of future congressional hearings about CAS, the legislators asked the same questions raised in the 1971 CAS hearings—such as why the Air Force did not choose the Harrier). During this time, Congress sanctioned a GAO study of the A-10, and that agency's March 1974 report stated that the plane was not developed enough to judge cost issues. However, the GAO added that the design-to-cost philosophy governing its creation probably would prevent cost overruns. There was also the Texas congressional delegation's interest in LTV's A-7. House Appropriations Committee Chairman George Mahon criticized the A-10. "It seems to present a beautiful target," he acidly remarked in one hearings session. Apparently, Texas' influence became overt enough that Fairchild

None of the sources consulted for this work specifically mentions why the A-4 was not included per the Senate's wishes expressed in its CAS hearings report. However, one can surmise some reasons why. The flyoff promised to be complex enough with only two jets. LTV did not have the wide domestic and international market for its A-7 that McDonnell-Douglas had for the A-4. Thus, LTV was more desperate and its representatives fought harder for it. The A-7 appeared to be a more promising candidate, given its excellent range and load carrying capacity, as well as rave reviews for its navigation and weapons delivery avionics performance in Vietnam. Indeed, a later document scores the A-4 for its comparative weakness in these regards--as well as its greater battle damage vulnerability compared to the A-10. See DDR&E, Decision Coordinating Paper (DCP) 23B, 19 February 1975, 10.

and H.R. 6722, 93d Cong., 1st sess., 21 May 1973, 1339-1340; Futrell, <u>Ideas</u>, vol. I, 528-529; and Robinson, "USAF Unveils War Game Study to Blunt A-10 Contract Attacks," <u>AW&ST</u>, 14. SABER ARMOR ALPHA occurred in support of David Packard's 1971 close air support study group, and favorably compared the A-X with various attack aircraft in the European theater antitank role. SABER ARMOR BRAVO was completed in spring 1972, and dealt mostly with European CAS command and control issues. However, it noted that air power could play a big role in blunting a Soviet armored breakthrough. SABER ARMOR CHARLIE appeared as the DSARC chose the A-10 over the A-9, and compared the A-10 with the A-4 and A-7 in various performance categories, threat scenarios, and weather situations as they pertained to European CAS. It weighed any questionable factor in favor of the other two planes. The A-10 won for its loiter, maneuverability, lethality, basing, survivability, and cost effectiveness. In the Robinson piece, the Air Force asserts that the studies were not intended to sway the legislators.

President Ed Uhl held a press conference in late August 1973 complaining about it. "It's time for the New York delegation to get out and tell *our* story," he asserted (italics in the original quotation). One could dismiss Uhl's action as so much political noise, but many sources, at least one of them Texan, agreed. Brigadier General Thomas McMullen took over the A-10 SPO just after the A-9 flyoff (which reflected some increase in project status, since his predecessor, Hildebrandt, was a colonel), and he later said that politically motivated pressure for a flyoff was evident. Congressman Robert Price (R-TX) served on the House Armed Services Committee during this time, and his recollection was that the Texas delegation believed the New York delegation was trying to push the A-10 upon the rest of Congress without the A-7 getting its due. Also, to Price and others, there was a more important item–a growing opinion that the A-10 was no longer the best plane for the modern CAS arena.<sup>37</sup>

<sup>&</sup>lt;sup>37</sup>For Congress' concerns about the A-10's cost and survivability during the 1973-1974 timeframe, see Anthony Battista, interview by author; Congress, House, Hearings, DoD Appropriations for 1974, Part 6, 1346-1348; Congress, House, Hearings, DoD Appropriations for 1974, Part 7, 1008-1016; Congress, House, Hearings before a Subcommittee of the Committee on Appropriations, DoD Appropriations for 1975, Part 7 93d Cong., 2d sess., 23 May 1974, 1052-1060; Congress, House, Hearings, H.R. 6722, 1330-1336 (includes Congressman George O'Brien's [R-IL] question about the Harrier and Air Force Deputy Chief of Staff for Research and Development, LTGEN Otto Glasser's patient reply that the Harrier lacked the range, payload, and durability desired by his service); BGEN Raymond Furlong, USAF, Memorandum for Director of Defense Research and Engineering, 17 September 1973, supporting documents; Otis Pike, interview by author; Robert Price, interview by author; and James Schlesinger, interview by author. Furlong notes that Senator Cannon "challenged the survivability of the A-10 in the European environment." Pike said that survivability was an issue with some of his congressional colleagues. Schlesinger was Defense Secretary at the time, and he recalled concerns about A-10 survivability in Europe.

For the Texas influence and Mahon's opinions, see Adams, interview by author; Anthony Battista, interview by author; Congress, House, Hearings before a Subcommittee of the Committee on Appropriations, <u>DoD Appropriations for 1974, Part 7</u>, 93d Cong., 1st sess., 27 September 1973, 999-1004 (quote, 1000); Congress, House, Committee on Armed Services, <u>Hearings on Military Posture and H.R. 12564, Part 1</u>, 93D Cong., 2d sess., 4 March 1974, 614 (Texas Republican Congressman Robert Price compares the A-7 and A-10 to "flying a Cadillac, I suppose and a Model T Ford"); CAPT Mark Cleary, USAF, <u>General Robert Dixon</u> (Oral History Interview, 18-19 July 1984), 301, transcript, AFHRC Holding K239.0512-1591; Robert Giamio, interview by author (in 1973, he was a

The legislators reached this conclusion due to American tactical air power's--and more specifically, the A-7's--fortunes in the last full year of American involvement in Vietnam, 1972. In their Easter Offensive that year, the North Vietnamese launched a massive conventional assault against South Vietnam and brought more sophisticated antiaircraft weapons systems with them. Radar-controlled SA-2 missiles threatened American aircraft in Laos and just south of the demilitarized zone (DMZ), and communist troops used the shoulder-launched, heat-seeking SA-7 (for photo, see Appendix Fig. 39) throughout South Vietnam. Their action caught American airmen off guard, and aircraft losses mounted, especially among slower-moving or less maneuverable aircraft such as helicopters, the A-1 (now flown almost exclusively by South Vietnamese), the AC-130, and the OV-10. Adjusting altitudes and attack routing helped somewhat, and using decoy flares also helped, but the bottom line was that the Americans initially were not prepared for this new threat. The invasion gave the Air Force a chance to use its A-7Ds in combat, as the Americans rushed air units into Southeast Asian bases to stanch the communist onslaught. The A-7D did well, suffering minimal combat losses in missions over both

new Democrat congressman from Connecticut skeptical about funding more than one CAS plane; says the Texas influence was not provable in fact, but there were strong overtones; recalls that questions about the A-10's survivability was another congressional concern); Gunston, 267-268; Morton Mintz, "The Maverick Missile: If at First You Don't Succeed . . . A Case Study of Defense Procurement Problems," <u>The Washington Post</u> (article series starting 23 February 1982), reprinted in <u>More Bucks, Less Bang</u>, ed., Rasor, 183 (page reference from reprint); LTGEN McMullen, interview by author; Otis Pike, interview by author; Robert Price, interview by author; Schlesinger, interview by author; Robert Sanator, interview by author; and Watson, "Close Air Support Aircraft," 38. Adams was the TAC Headquarters project officer for the flyoff, and observes that LTV pushed the issue continually. Battista said the flyoff issue seemed like a battle between Mahon and Pike.

GAO's report, U.S. General Accounting Office Staff Study, <u>A-10 Close Air</u> <u>Support Aircraft</u> (March 1974), points up Congress' concerns about the plane at this time: cost, survivability, and effectiveness compared to the A-7. The report urged continued vigilance by Congress regarding this plane. See "Summary," 1-9.

North and South Vietnam, and impressing everyone with its ability to carry bombs long distances and accurately hit targets.<sup>38</sup>

Combat in the Middle East further sparked congressional skepticism about the A-10's survivability against modern threats, and it would also affect CAS tactics and developments for years to come. In October 1973, the Israeli Air Force (IAF) encountered serious difficulties early in the Yom Kippur War (also known as the October War) providing CAS to its beleaguered ground forces. Though the IAF included CAS as one of

McAdoo was an Air Force pilot who flew both A-37s and A-7s in Vietnam. He praises the A-7's performance, but concedes the best solution is a mix of A-7s and A-10s because each contributes to ground attack in a specific way. McGrath flew as a FAC during the Easter Offensive, and observes that the new antiaircraft weapons initially caught airmen unawares. Geiger and company specifically recount congressional doubts about A-10 survivability, as well as that body's admiration for the A-7's recent Vietnam performance. Price cited his own background for his skepticism; he flew fighters in the Korean War. Watson quotes from a record of a September 1973 meeting between Senator Cannon and Defense Secretary James Schlesinger, in which Cannon told the Defense Secretary that he seriously doubted the A-10's survivability in a European environment, and wanted a flyoff with the A-7. Werrell cites testimony by Seventh Air Force commander, General John Vogt, to claim that the SA-7 "put some aircraft, such as the A-1, out of business" (116). Both Andradé and Dorr contradict this claim with several specific examples of South Vietnamese and American A-i exploits during this campaign. Andradé writes that the SA-7 forced all American fliers, especially helicopter pilots, to change their tactics. Helicopters were very vulnerable to the missiles, and could not underfly their employment envelope due to the even greater AAA threat down low. Futrell also cites Vogt's testimony, which was in connection with his strong praise for the A-7. Vogt did not like the A-10 either; see Talbott, 144.

<sup>&</sup>lt;sup>38</sup>Dale Andradé, <u>Trial by Fire: The 1972 Easter Offensive, America's Last Vietnam</u> <u>Battle</u> (New York: Hippocrene Books, 1995), 28-29, 40, 87-88, 117, 156-157, 219, 349, 475, 510-511, 536-537; Brownlow, "Senate Unit Presses A-7/A-10 Flyoff," 18-19; COL John Doglione, USAF, and others, "Airpower and the 1972 Spring Invasion," Part II of <u>Air War-Vietnam</u>, COL Donaldson Frizzell, and others, eds. (New York: Arno Press, 1978), 97-206; James Dorr, <u>Skyraider</u>, 150-151; Futrell, <u>Ideas</u>, vol. II, 482-483, 529 (A-7 Vietnam performance, and Congress' Easter Invasion-based skepticism about the A-10); Geiger, et al, "History of the Aeronautical Systems Division, July 1973-June 1974," 80-81; CAPT Patrick McAdoo, USAF "Letters to the Editor: A-7D/A-10A Debate," <u>AW&ST</u> 99 (17 September 1973): 126; LTCOL McGrath, interview by author; Price, interview by author; Watson, "Close Air Support Aircraft," 38-40; and Werrell, <u>Archie, Flak, AAA, and</u> <u>SAM</u>, 115-116.

its missions, its commanders disparaged it and IAF units did not practice it much. Their openly stated preferences followed the U.S. Air Force's doctrinal priorities, and upon examination, one could easily see why. The IAF's battle doctrine fit Israel's particular conditions as a small desert nation facing larger, hostile, but militarily second-rate neighbors. Its leaders preferred the quick strike against their enemies' vitals to achieve early victory and avoid a protracted, expensive conflict. When the Israelis concentrated upon immediately gaining air superiority, as they had in the 1967 Six Day War, it allowed them to freely attack Arab military targets that could not hide in the open desert as military units could in other environments. Quick action also naturally favored interdiction over close air support's more time-consuming, direct contact, nature. And since the Israeli Army whipped its Arab opponents in every war since Israel's embattled 1948 birth, CAS was almost irrelevant. Interdiction far better served to pummel or eliminate any rear-echelon forces that the Israeli Army might later encounter in its inevitable advance. Even after the October War ended, and rumors surfaced that the IAF did not perform CAS up to expectations during the desperate early days, both the Israeli Army leadership and IAF commander Major General Benyamin Peled dismissed CAS as too costly and difficult for the expected tactical return.<sup>39</sup>

<sup>&</sup>lt;sup>39</sup>Gerald Astor, "The World's Toughest Air Force: It Keeps Israel Alive," Look, 30 June 1970, 20-21; Anthony Cordesman and Abraham Wagner, <u>The Lessons of Modern</u> <u>War, Volume I: The Arab-Israeli Conflicts, 1973-1989</u> (Boulder, Colo.: Westview Press, 1990), 90, 95-97; Futrell, <u>Ideas, vol, II</u>, 484; Greenhous, "Israeli Experience," in <u>Case</u> <u>Studies</u>, ed. Cooling, 493-511, 520-527; Chaim Herzog, <u>The Arab-Israeli Wars: War and</u> <u>Peace in the Middle East</u> (New York: Random House, 1982), 230; COL Michael Herzog, Israeli Defense Force (IDF), introduction to <u>The War of Atonement</u>, by Chaim Herzog (London: Weidenfield and Nicolson, 1975; reprint, London: Greenhill Books, 1998), xixvii (page references to reprint; COL Herzog is Chaim Herzog's son); AVM Tony Mason, <u>Air Power: A Centennial Appraisal</u>, 69-71, 74, 76-79; and Wetmore, "Israelis' Air Punch Major Factor in War," 21-23; Lon Nordeen, Jr., <u>Air Warfare in the Missile Age</u> (Washington, D.C.: Smithsonian Institution Press, 1985), 146. Astor quotes such luminaries as Six Day War IAF commander Mordecai Hod to demonstrate the IAF's disregard for Arab war technology capabilities.

Israeli military leaders' postwar opinions of CAS are courtesy of reprinted interviews in Air War College Text, Lessons 8-13, 151-155; see David Eleazar (Chief of Staff of the Israeli Defense Force during the October War), "Israel's Eleazar Evaluates

The October War's first few days featured a reversal of priorities, however. Diplomatic considerations and hubris created by past victories led the Israelis to forego a preemptive strike against a looming Arab attack. Thus, the war commenced with massive Arab ground assaults across the Suez Canal and toward the Golan Heights.<sup>40</sup> The Israeli Army barely repelled them, especially on the Golan Front, and CAS became the IAF's most important mission as the soldiers frantically called for air support. The IAF was not only unready for CAS but also for the air defenses the Arab army units brought with them. These included the latest Soviet-made mobile SAMs, such as the SA-6, and mobile, radar-guided AAA, such as the ZSU-23 (for photos, see Appendix Figs. 40-41). The Israelis had neglected upgrades to their electronic countermeasures (ECM), apparently due to faith in their own tactics as well as their contempt for the Arabs' competence with modern air defense weapons. When Israeli jets flew CAS on the Golan Front, they faced 100,000 Arab soldiers with 1,500 tanks, over 400 anti-aircraft guns, and at least 100 SAM batteries. This force crammed itself into a front 25 miles wide, which a jet going 450 knots could traverse in about 3 minutes. Avoiding metal aimed at one's jet is difficult in such close quarters against a densely packed defense, especially when one is not well prepared for it. One Israeli observer said that when the first Israeli jets attacked the Arabs' Golan juggernaut, "simultaneously we saw over fifty ground-to-air missiles in the air at one time. Over fifty on a very, very narrow strip of land." In the first few days, the Israelis lost fifty

Yom Kippur War," <u>Aerospace Daily</u> (5 November 1973): 22-23 (pp. from journal); and MGEN Benyamin Peled, Israeli Air Force (IAF), "Air Force Chief Discusses Experiences of Yom Kippur War," interview reproduced in <u>Translations on Near East</u> #1238 (U.S. Joint Publications Research Service, October 1974): 46-51 (page references are to journal).

<sup>&</sup>lt;sup>40</sup>The political decision not to preempt is from Futrell, <u>Ideas</u>, vol. II, 484; Chaim Herzog, <u>The War of Atonement</u> (London: Weidenfield and Nicolson, 1975; reprint, London: Greenhill Books, 1998), 52-54 (page references are to reprint); and Howard Sachar, <u>A History of Israel: From the Rise of Zionism to Our Time</u> (New York: Alfred A. Knopf, 1976), 754-755.

planes--half of the estimated total Israeli air losses for the two-week war.<sup>41</sup> Finally, rancor occurred during and after the war about the IAF's CAS effectiveness. The command and control setup for directing IAF fighters to CAS targets was not well rehearsed. Thus, ground units sometimes complained of a lack of air support. Arab defenses made the IAF pilots rush their attacks or release ordnance at longer distances, thus reducing accuracy. Though the IAF played a key role in blunting Arab assaults on both fronts, some observers asserted that its effectiveness owed more to its shock effect against Arab troops than in actual destruction of Arab tanks.<sup>42</sup>

The SA-7 mostly was a nuisance in the war; when the small missile hit the jets it usually damaged only their tailpipe. The SA-6 and ZSU-23, on the other hand, were quite lethal. Israeli pilots diving low to avoid SAMs wound up in the clutches of the radar-guided AAA. Helicopters apparently did not fare well, either. Both sides suffered notably high helicopter casualties. The Arabs often salvo fired their missiles without regard as to whose planes were in the air. As a result, they shot down as many of their own planes as they did Israeli planes.

<sup>42</sup>MAJ Donald Alberts, USAF, "Tactical Air Power in NATO: A Growing Convergence of Views," <u>Air University Review</u> 31 (March-April 1980): 67 (pithy assessment of IAF's normal doctrinal priorities versus its early-October War priorities); Andrew Cockburn, <u>The Threat</u>, 132-133; Cordesman and Wagner, 92-97; James Crabtree, <u>On Air Defense</u>, 152-157; Futrell, <u>Ideas</u>, vol. II, 484-487; Greenhous, 510-527 (quote is from Mordecai Hod, who by the time of the war had retired as IAF commander and was serving as an air advisor to the army on the Golan Front, 515); Chaim Herzog, <u>The War of Atonement</u>, 251-261 (generally favorable to IAF, but notes priority reversal); Hogg, <u>Tank Killing</u>, 166; Mason, 72-76; Nordeen, 147-165; MAJ Ross Smith, USAF, "Close Air Support–Can It Survive the 80s?" (Master's thesis, U.S. Army Command and General Staff College, 1979), 47-53; Russel Stolfi, interview by author.

Aircraft effectiveness against tanks was again an issue. Greenhous' verdict is balanced. He recounts several instances where the IAF scored important successes against Arab ground units, but gives only moderate credit to the fighters' antitank claims. He quotes the IAF colonel assigned to the postwar battle damage assessment team, Yoash Tsidon-Chatto, as saying that most Arab tank hulks had both air and ground fire hits scored on them. Thus, assigning proper credit for a tank kill was nearly impossible (16). Russel Stolfi also did tank battle damage assessment after this war. He told the author that aircraft

<sup>&</sup>lt;sup>41</sup>Andrew Cockburn, <u>The Threat:</u> Inside the Soviet Military Machine (New York: Random House, 1980), 132-133; Cordesman and Wagner, 92-97; James Crabtree, <u>On Air</u> <u>Defense</u>, The Military Profession Series (Westport, Conn.: Praeger, 1994), 152-157; Futrell, <u>Ideas</u>, vol. II, 485-487; Greenhous, 512-515 (quote, 515); Nordeen, 147-165; and Werrell, <u>Archie</u>, 139-146.

The Israelis recovered, of course, taking advantage of Arab mistakes and their own successful combined air-ground efforts against Arab SAM sites. War's end witnessed Israeli ground forces seizing more Arab territory with their trademark slashing attacks, and the IAF crushing Arab ground reinforcements with an effective interdiction campaign. As mentioned, Israeli leaders dismissed any criticism of their CAS performance by saying that it was too costly and yielded little return.

For the next several years, this conflict affected military thinking, especially on tactical air power. Commentators wondered if and how tactical jets could still influence battlefield events as they had done in every war since World War II.<sup>43</sup> This obviously

Israeli aircraft losses vary by source, since all are estimates due to the Israelis' understandable reticence on the matter. But all sources indicate that CAS-related losses in the first three days of the war comprised approximately 50 percent of the IAF's losses.

<sup>43</sup>For sources explaining or symbolizing the war's general or tactical air power significance, both at the time and years later, see Vincent Caterina and Thomas McDonnell, "Future Air Combat Environments: An Analysis of USAF Tactical Aircraft Entering the Inventory," Student Paper (Santa Monica, Calif.: California Seminar on Arms Control and Foreign Policy, 1979), 3; Cockburn, <u>Threat</u>, 132; Seymour J. Deitchman, "The Implications of Modern Technological Developments for Tactical Air Tactics and Doctrine," <u>Air University Review</u> 29 (November-December 1977): 36, 43 (opined about air defenses that the "worst case must be anticipated everywhere," 43); COL Trevor N. Dupuy, USA (ret.), <u>The Evolution of Weapons and Warfare</u> (Indianapolis, Ind.: The Bobbs-Merrill Company, 1980), 282-283; Michael Evans, "History of Arms Is the Difference," <u>Proceedings</u> 124 (May 1998): 75; "Five Lessons of the War," <u>Newsweek</u>, 5 November 1973, 54, (discusses problems posed by densely packed, integrated radar anti-aircraft defenses); Futrell, <u>Ideas</u>, vol. II, 485, 487-490 ("lessons" of the war and the

killed only a few tanks. Stolfi acknowledged that tank hulks often had both ground and air hits, but that the ground hit was obviously lethal whereas the air hit was not. (Ground hits were usually from Israeli 105 mm tank rounds, and air hits included 30 mm Aden cannon rounds, rockets, and cluster bomblets.) Cordesman and Wagner also were skeptical of claims made in the defense press and elsewhere of the IAF's prowess against tanks in this war; for an example, see Herbert Coleman, "Israeli Air Force Decisive in War," <u>AW&ST</u> 99 (3 December 1973), 18-21. However, both they and Stolfi conclude that the IAF affected the Arabs' ground effort by disrupting their advances and destroying their morale, if nothing else. One also could say that IAF hits upon tanks may have caused the crews to abandon them; and then wary Israeli tank crews assumed that the Arab tanks that they faced were still operational and shot them again. Hogg credits the Israelis' greatest October War victories over Arab armored forces to well-prepared ground ambushes.

battlefield events as they had done in every war since World War II.<sup>43</sup> This obviously impacted the A-10's fortunes. Though Congress had already forced a flyoff against the

Futrell also observes that many congressmen asserted that the Soviets' air defense weapons were cheap but effective, thus driving an American push for a "mix" of expensive and cheaper weapons. Kishline observed that the war created immediate skepticism about the A-10's ability to defeat the SA-7, which in turn led to testing that proved the A-10's ability to defeat such missiles. O'Rourke sees the October War punctuating a trend toward more lethal air defenses. Rasmussen bases his article about Soviet air defense on the October War's results, and states that all planes will require defense suppression to operate. Stealth aircraft designer Ben Rich recalls that the October War spurred work on stealth, since the war's results genuinely scared Air Force tactical air planners. Smith believes that the October War proved that CAS was too expensive, and prefers interdiction.

<sup>&</sup>lt;sup>43</sup>For sources explaining or symbolizing the war's general or tactical air power significance, both at the time and years later, see Vincent Caterina and Thomas McDonnell, "Future Air Combat Environments: An Analysis of USAF Tactical Aircraft Entering the Inventory," Student Paper (Santa Monica, Calif.: California Seminar on Arms Control and Foreign Policy, 1979), 3; Cockburn, Threat, 132; Seymour J. Deitchman, "The Implications of Modern Technological Developments for Tactical Air Tactics and Doctrine," Air University Review 29 (November-December 1977): 36, 43 (with air defenses, must now assume the "worst case . . . everywhere," 43); COL Trevor N. Dupuy, USA (ret.), The Evolution of Weapons and Warfare (Indianapolis, Ind.: The Bobbs-Merrill Company, 1980), 282-283; Michael Evans, "History of Arms Is the Difference," Proceedings 124 (May 1998): 75; "Five Lessons of the War," Newsweek, 5 November 1973, 54, (problems posed by densely packed, integrated radar antiaircraft defenses); Futrell, Ideas, vol. II, 485, 487-490 ("lessons" of the war, the Air Force's ensuing programs; COL Michael Herzog, introduction to War of Atonement, by Chaim Herzog, xi-xvii; Robert Hotz, "The Mideast Surprise," AW&ST 99 (15 October 1973): 7; Sam Kishline, interview by author; Kenneth Macksey, Technology in War (New York: Prentice-Hall, 1986), 194-200; Mason, 76; Newsweek magazine's 22 October 1973 issue, which contains "A War that Broke the Myths," 60, and "Warning: 'No Easy Victories," 63-64, 79; CAPT Gerald O'Rourke, USN (ret.), "Is TacAir Dead?" United States Naval Institute Proceedings (henceforth referred to as Proceedings) 102 (October 1976): 35-41; COL Robert Rasmussen, USAF, "The Central Europe Battlefield: Doctrinal Implications for Counter-Air Interdiction," Air University Review 29 (July-August 1978): 2-20 (tactical air planner who worked A-10 employment issues); Ben Rich and Leo Janos, Skunk Works: A Personal Memoir of My Years at Lockheed (Boston, Mass.: Little, Brown, 1994), 16-18; Gideon Rose, "Arab-Israeli Wars," in Robert Cowley and Geoffrey Parker, eds. The Reader's Companion to Military History (Boston, Mass.: Houghton Mifflin, 1996), 27; Smith, "Close Air Support--Can It Survive the 80s?" 53-57, 91-93; and David Stein, "The Development of NATO Tactical Air Doctrine, 1970-1985," RAND Project AIR FORCE Report #R-3385-AF (Santa Monica, Calif.: RAND, December 1987), 46.

A-7, after October 1973 its members pressed Air Force leaders for answers about the war's "lessons" as they pertained to the A-10's survivability. After all, it was the Israeli Air Force, the internationally acclaimed master of aerial battle, which encountered these problems. In March 1974 hearings, Tactical Airpower Subcommittee Chairman Howard Cannon asked Air Force witnesses what they thought of the Israelis' postwar opinion that any plane that flew CAS required high speed, excess thrust to sustain hard maneuvering, and the best anti-aircraft counter-measures equipment. The Air Force witnesses countered that the American-built A-4s and F-4s that Israel chose for its interdiction-oriented ground-attack mission did not possess the A-10's survivability features. They repeated the CAS adage that too much speed hindered the ability to acquire and attack targets. And they reminded the senators that, although the Israelis did not like CAS, the requirement for the mission certainly existed when their army was nearly overrun on the Golan Heights. They could also have pointed out that the A-4s and F-4s were fast enough already, and that their speed had not made much difference in the situations that they faced over the Golan Heights and Suez Canal. Senator Thurmond directly asked Air Force witnesses if the A-10 could have survived in such an environment, and why the service needed such a plane instead of the combat-proven A-7. They replied that the U.S. Air Force's more varied arsenal and capabilities would have provided better airborne defense suppression-in other words, the United States was not Israel. They also repeated the service's already-stated preference for the A-10 due to its customized design for CAS.<sup>44</sup>

<sup>&</sup>lt;sup>44</sup>The source for the March 1974 hearing is Congress, Senate, Hearings before the Tactical Air Power Subcommittee of the Committee on Armed Services, <u>Fiscal Year 1975</u> <u>Authorization for Military Procurement, Research and Development, and Active Duty,</u> <u>Selected Reserve and Civilian Personnel Strengths, Part 8</u>, 93d Cong., 2d sess., 14 March 1974, 4310-4313, 4316-4317, 4345-4347. Another source for where legislators raised the October War as an item concerning the A-10 and CAS is Congress, Senate, Hearings before a Subcommittee of the Committee on Appropriations, DoD Appropriations for <u>Fiscal Year 1975, Part 4</u>, 93d Cong., 2d sess., 7 March 1974, 603-604. The senators do not specifically mention the war, but want to know how the A-10 would fare against the threats, such as the SA-6, which did so well in it. See also Futrell, <u>Ideas</u>, vol. II, 529; and GAO, <u>A-10 Close Air Support Aircraft</u>, 8. Futrell quotes exchanges between congressmen and Air Force leaders that follow the same line as the Tactical Air Power Subcommittee hearing cited herein. He notes that the legislators "were intensely interested" (529) in what

# The Preparations for, and Context of, the Competition

With such a rising crescendo of doubt, the Air Force worked to create a situation that suited all sides. At congressional hearings, its leaders de-emphasized the flyoff's consequences. A flyoff implied that there would be a winner that would be procured, and a loser that would not. The Air Force was confident that the A-10 would "win," and that the A-7 would continue service in the Air National Guard (ANG). Perhaps to some, this implied relegation to a nonactive status, but the A-7 would remain in the Air Force wartime force structure and provide a nice air support complement to the A-10.<sup>45</sup>

OSD made TAC the lead command for conducting the test, with two OSD agencies, DDR&E and WSEG, providing guidance for planning and evaluation. Given TAC's opinion of slow-speed planes, one might think that the test featured conditions supporting a conclusion that neither plane passed scrutiny—and that the CAS plane should

the air leaders thought of the A-10 and its survivability in an October War air defense environment. The GAO report urges that the A-10 fly against some of the Soviet weapons captured by the Israelis, which included various anti-aircraft weapons and the T-62 tank.

Many of the sources noted in this citation imply or directly state that the Israelis are masters of war and that their precepts should be followed. Also, several observers express shock that such misfortune befell the IAF in the October War's early days. One forgets that the Israelis' military situation is quite specific compared to that of the United States, and in this war at least, they were neither as well prepared nor capable of waging their preferred type of campaign as in other conflicts. But they are great fighters, and Americans still cite their opinions to make their own points. The Air War College text previously cited for the October War features four articles on that war; one is a general account, one tells of the American resupply airlift, and two are interviews with Israeli leaders who disparage CAS. For an example of the IAF's stature before the war, see Astor, "The World's Toughest Air Force," 17-22.

<sup>&</sup>lt;sup>45</sup>Cleary, <u>Dixon</u>, 301, 303; Congress, House, Hearings before a Subcommittee of the Committee on Appropriations, <u>Department of Defense Appropriations for 1975</u>, Part <u>4</u>, 93d Cong., 2d sess., 29 April 1974, 860; Congress, House Hearings, <u>H.R. 6722</u>, 1337; and Congress, Senate Hearings, <u>Fiscal Year 1975 Authorization for Military</u>, 4183, 4319. In the above 29 April 1974 hearing, Air Force Deputy Chief of Staff for Research and Development, LTGEN William Evans, tells the committee that if the A-10 lost, its future would be in serious jeopardy, but he does not feel this will happen.

be the F-4. At the least, one might expect a conclusion favoring the faster, and more avionics-laden A-7.<sup>46</sup>

But opinions within TAC were changing, at least at the top leadership level. Ever the good soldier, General Momyer told subordinates who opposed the A-10 that they would support it. Not only this, but both the Air Force Chief of Staff, General George Brown, and Momyer strove to improve cooperation with the Army—something that the Army leadership reciprocated. When General Momyer retired in October 1973, his successor, General Robert Dixon—the same Dixon who served on the Air Force Pentagon staff at the time of the A-X's conception—resolutely followed the same course. Both TAC commanders, and the commander of the Army's Training and Doctrine Command (TRADOC), General William DePuy, pursued a dialogue on training and operational issues that led to the July 1975 formation of the Air-Land Forces Application Directorate (ALFA) at Langley AFB, Virginia. This was appropriate, for TAC'S headquarters was also at Langley, and Langley was in turn a "15 minute drive" from TRADOC's headquarters at Fort Story. Thus did placing TAC and the Army's training and doctrine headquarters close by each other—accomplished with TAC's formation in 1948—finally achieve results.<sup>47</sup>

<sup>&</sup>lt;sup>46</sup>Malcolm Currie, DDR&E, Memorandum for the Secretaries of the Army, Air Force, and the Director of WSEG, "Fly-Off between the A-7 and A-10 Aircraft," 23 October 1973; Malcolm Currie, DDR&E, Memorandum for the Secretary of Defense, "Fly-Off between the A-10 and A-7," 2 October 1973, both memoranda are supporting documents; Watson, "Close Air Support Aircraft," 40-43. The 23 October DDR&E memo is OSD's "tasker" to the various departments involved in the flyoff. In the 2 October memo, Currie gives a short history of the 1973 scrap over the flyoff between OSD and the Air Force on the one side, and Congress on the other. He notes concerns about using an undeveloped prototype against a combat proven plane--as well as Cannon's reply that the flyoff address pilot assessments and not aircraft development. Citing Cannon's concerns about survivability, he adds that he will direct the testers to address this. Finally, WSEG would provide an independent assessment of the results.

<sup>&</sup>lt;sup>47</sup>Adams, interview by author (worked A-10 issues at TAC staff at the time; Davis, <u>31 Initiatives</u>, 24-26; Futrell, <u>Ideas</u>, vol. II, 539-546; <u>Sweat</u>, 120 (Sweat was Vice Commnader of TAC from 1972 through 1974); LTCOL Harold Winton, USA (ret.), "Partnership and Tension: The Army and Air Force between Vietnam and Desert Shield,"

There were several reasons for the shift. Army, Air Force, TAC, and TRADOC commanders of the time either had joint-service staff backgrounds, such as Dixon, or recalled the well-coordinated air support that developed in Vietnam, such as Army Chief of Staff, General Creighton Abrams. In an interview, Dixon demonstrated his Army commitment by tartly asserting that "we would crash airplanes into the opposing troops to provide close air support, if those were the required circumstances. If you think that is a joke, it ain't a joke to me at all. That may be one of the reasons why the Army and I understand each other."48 They also did not want a repeat of the A-X/Cheyenne competition, which had nearly expanded into a major political battle with Congress dictating terms unsatisfactory to both services. Another reason was that with the end of America's involvement in Vietnam, attention shifted back to Europe and the fact that the Soviets enjoyed an increasingly lopsided numerical superiority over NATO forces, especially in tanks. After Cheyenne's cancellation, the Army possessed only Cobra attack helicopters that carried the new TOW anti-tank missile, but lacked the performance and weapons carriage capability the Army wanted. That service was only just commencing its search for another advanced attack helicopter design, a process which did not produce an operational aircraft until 1985. In the meantime, the soldiers needed firepower, something

Considering the impact of Vietnam War CAS upon senior Air Force and Army officer thinking, Momyer's recollection was that the war created an artificially benign environment that allowed CAS to be conducted with impunity. And though he conceded that CAS would be necessary in future wars, he believed that the nature of these conflicts would be much more inimical to the CAS mission. See GEN William Momyer, USAF, "Close Air Support," in <u>Supplement to the Air Force Policy Letter for Commanders</u> (Washington, D.C.: SAF-OII, June 1973), 13-21; and GEN William Momyer, USAF (ret.), "Validation of Close Air Support (CAS) Phase II Results," Memorandum for General Ralph, 9 January 1975, AFHRC Holding K168.7041-131.

Parameters (Spring 1996): 101-105 (quote, 105).

<sup>&</sup>lt;sup>48</sup>Cleary, <u>Dixon</u>, 274-276, 299-300 (quote, 300); and Edgar F. Puryear, Jr., <u>George</u> <u>S. Brown, General. U.S. Air Force: Destined for Stars</u> (San Francisco, Calif.: Presidio Press, 1983), 212. Brown was Air Force Chief of Staff from August 1973 to August 1974. Puryear relates that when Brown heard that a subordinate general berated the A-10, he wanted "a good piece of him"; the A-10 and its promise of better air support relations with the Army was too important to disparage.

that they felt the Yom Kippur War confirmed. New weapons and fire control systems made the war as costly on the ground as it had been in the air, as tank losses for both sides appalled observers. Indeed, as the A-7/A-10 controversy climaxed, TRADOC commander DePuy started work on a new, October War-inspired, Army conventional warfighting doctrine. It emphasized that the Americans had to mass their firepower to defeat a Soviet attack in Europe, because "the first battle of our next war could well be its last battle." This in turn signified that the Army needed Air Force firepower. Indeed, since the Army's Cheyenne project had failed, that service waxed more more enthusiastic about the A-10. The plane not only provided heavy antitank firepower, but also an Air Force guarantee of dedicated air support against a Soviet tank assault. Thus, in the congressionally incited controversy between the A-7 and A-10, the Army publicly stated its preference for the custom-made, durable, and long-loitering tank killer.<sup>49</sup>

Bradin recounts the extensive modifications required to make the Cobra meet the Army's increased antitank requirements after the Cheyenne project failed. Futrell identifies the 1968 Soviet invasion of Czechoslovakia as the spark for increased NATO awareness. Geddes cites Army backing of the A-10 prior to the flyoff. Gunston's work contains dates of developmental milestones for the AH-64, and notes that the Soviet armored threat in Europe continued to drive the Army's desire for an advanced attack helicopter. McMullen noted that the Army had just lost Cheyenne and saw the A-10 as a positive Air Force step. Schlesinger recalled that the Army hoped that the A-10 represented an Air Force bona fide about CAS. Winton writes that, to the Army, "the A-10 ground attack aircraft was the most tangible and, in many ways, the most significant indicator of the Air Force's commitment to air-ground operations between Vietnam and Desert Shield" (104).

<sup>&</sup>lt;sup>49</sup>Quote is from Romjue, <u>From Active Defense to AirLand Battle</u>, 6. Other sources are Adams, interview by author (cites Army support for the A-10 during the flyoff); "A-10/A-7 Flyoff Rules Drafted," <u>AW&ST</u>, 23; Bradin, "Birth of a Brave," chap. in <u>From Hot Air to Hellfire</u>, 133-156; Davis, <u>31 Initiatives</u>, 24-29; Dupuy, <u>Evolution of Weapons and Warfare</u>, 310; GEN William DePuy, USA, to GEN Frederick Weyand, USA, 18 February 1976, reprinted in John Romjue, <u>From Active Defense to AirLand Battle</u>: <u>The Development of Army Doctrine</u>, <u>1973-1982</u> (FT Monroe, Va.: TRADOC, 1984), 82-86; Futrell, <u>Ideas, vol. II</u>, 490-510, 546-548; Geddes, "A-10--USAF Choice," <u>IDR</u>, 71; Gunston, <u>AH-64 Apache</u>, 4-8, 41-44; Orr Kelly, <u>King of the Killing Zone</u> (New York: W.W. Norton, 1989), 230-231; LTGEN McMullen, interview by author (A-10 project director at this time; Romjue, <u>From Active Defense to AirLand Battle</u>, 4-7; James Schlesinger, interview by author; Winton, "Partnership and Tension," 100-106; and Worden, <u>Rise of the Fighter Generals</u>, 222-223.

Further, President Nixon's Defense Secretary, James Schlesinger, sympathized with those who wanted a strong tactical air force to fight the Soviets. He did not favor the Air Force's high-technology air superiority bent, as evidenced by its desire for as many F-15s as it could acquire. In March 1974, he "struck a deal" with Air Force Chief of Staff General George Brown about force structure. In return for extra tactical air units, he secured from Brown the promise to support the A-10 and the new low-cost, lightweight fighter prototype, the F-16. When Brown left Chief of Staff to be Chairman of the Joint Chiefs of Staff in July 1974, the new Air Force chief, General David Jones, supported the arrangement even more strongly than Brown.<sup>50</sup>

The planners worked to ensure that the test setup addressed as much as possible the concerns and desires expressed by the Army, Congress, and within the service itself. Test objectives, simply put, were to: (a) determine the pilots' ability to acquire and attack targets when flying each plane; (b) determine each plane's ability to evade modern battlefield air defenses; and (c) gather each pilot's subjective assessment of the two planes. The latter objective was OSD and the Air Force's answer to Senator Cannon. As Cannon forced the service to hold the flyoff, he said that it need not be "too long or complex." He added that its main objective was "to take experienced combat pilots and let them fly both airplanes, the A-10 and the A-7D, and then make a judgment as to which airplane they would rather

<sup>&</sup>lt;sup>50</sup>Christie, interview by author; Dörfer, <u>Arms Deal</u>, 14-15 (the "Arms Deal" is not the Schlesinger-Brown agreement, but the sale of F-16s to NATO countries--however, Dörfer discusses the agreement on these pages); GEN David Jones, USAF (ret.), telephonic interview by author, 25 March 1997, recording and notes in author's possession; Mintz, "The Maverick Missile," <u>The Washington Post</u>, reprinted in <u>More Bucks, Less</u> <u>Bang</u>, ed. Rasor, 183 (quote; page reference to reprint); Schlesinger, interview by author; Sprey, interview by author; and Stevenson, <u>Pentagon Paradox</u>, 161, 176.

Jones did not mention the Schlesinger-Brown agreement, but felt that the service had made its decision for the A-10 and that it should follow through. Sprey recalled that he helped influence Schlesinger's agreement with Brown, but Schlesinger did not cite Sprey's influence in his interview. Schlesinger was sympathetic to tactical air power, especially air support, from his time at RAND in the 1960s. Schlesinger said that, as Defense Secretary, he sensed a continued lack of Air Force interest in the CAS plane, and that he wanted something to support the Army in Europe. Puryear does not mention the agreement in his biography of Brown. Stevenson writes that Sprey influenced Schlesinger on behalf of the F-16.

fly in combat." The flyoff would occur at the Army's Fort Riley, Kansas, maneuver area against armored vehicle arrays that represented either a Soviet battalion-sized attack or a breakthrough situation (Fort Riley's rolling, wooded terrain further matched European conditions). Defenses featured Army air defense weaponry that simulated the most lethal-or at least the most notorious-of those encountered in the Yom Kippur War. The Hawk missile stood in for the SA-6 (though it was an even more effective weapon than the Soviet missile), the mobile, radar-guided, antiaircraft Vulcan Gatling gun simulated the ZSU-23, and the Redeve shoulder-launched heat-seeker served as an SA-7 surrogate. As the planes attacked the target array, Army air defense troops would attempt to track them and provide hit assessments. The attack profiles simulated European conditions by asking the test pilots to adjust their maneuvers for four simulated weather situations of decreasing quality: (a) clear skies, and unlimited visibility; (b) 5000 feet cloud ceiling and 5 miles visibility; (c) 3000 feet ceiling and 3 miles visibility; and (d) 1000 feet ceiling and 2 miles visibility. Four Air Force fighter pilots with Vietnam CAS experience in either F-4s or F-100s would fly both competitor planes and make subjective judgments. To further guarantee impartiality, none of them had flown either plane before.<sup>51</sup>

<sup>&</sup>lt;sup>51</sup>Bridges, "Realism in Operational Test and Evaluation," 39 (Fort Riley suitability); GEN George Brown, CSAF (Chief of Staff of the Air Force), to TAC/CC, AFSC/CC, AFLC/CC ("CC" stands for commander), "A-10/A-7 Fly-off Planning," 10 December 1973, supporting documents (delineates conditions for the test); Congress, Senate, Fiscal Year 1975 Authorization, Part 8, 4321-4328 (Senators wanted the planes to face sophisticated air defenses); Currie, Memorandum for the Secretary of Defense, 2 October 1973, supporting documents (Cannon quote; and Currie's intention to answer Cannon's survivability concerns in spite of fears for the cost involved); P.G. Freck, and others, "Comparison of Some Aspects of the Relative Operational Effectiveness of the A-7D and A-10 Aircraft Engaged in Close Air Support," Weapons System Evaluation Group (WSEG) Report 212, (Arlington, Va.: WSEG, June 1974), 1-7, 27-38 (Freck was WSEG's project leader for this test), Air University Library; Headquarters USAF (office symbol AF/RDPN [Research and Development]), "Program Management Directive [PMD] for the A-10/A7D Fly-Off," 11 February 1974, supporting documents (spells out test objectives and conditions, and delineates responsibilities); Geiger, and others, "History of the Aeronautical Systems Division, July 1973--June 1974," 90-91; Harold Helfman, Deputy Director, Office of Information, Headquarters, Air Force Systems Command, Memorandum for Commander and Correspondents, "A-10/A-7D Comparative Flight Evaluation," 4 April 1974 (explains Fort Riley suitability), supporting documents;

#### The Question of Comparative Weapons' Effectiveness

The above plans reflected the service's best effort to determine--or perhaps better put, to demonstrate--which was the CAS best plane as the service envisioned it. One big flight test issue to be addressed/demonstrated was which airplane employed weapons more effectively. However, the test encountered problems in this regard, the most important of which concerned the 30 mm antitank gun that so defined the A-10.<sup>52</sup>

The gun project had experienced a few developmental adventures of its own by this time. Following the same procurement process as the A-X, project leaders had by June 1971 announced two competitors for a gun evaluation: Philco-Ford Aeronautics and General Electric (GE) Company. Both companies submitted Gatling gun designs as specified in DCP 103. Into the midst of this process came a proposal from DDR&E--apparently driven by Pierre Sprey--to substitute Switzerland's Oerlikon 304RK 30 mm gun for the Gatling gun designs. The Oerlikon had been rejected earlier as an A-X candidate due to its low reliability and rate of fire. However, it delivered its full rate of fire instantaneously while the Gatlings' rotating barrel clusters required a few seconds to spin up to their maximum rate. Sprey's logic was that in a typical strafing pass, the most accurate tracking occurred in the first two seconds--a concept that some A-10 weapons instructors later taught. To Sprey, the Oerlikon gun allowed the pilot to concentrate the maximum amount of shells on his target while his aim held. Those responsible for the gun

McMullen, interview by author; "USAF Agrees to Flyoff for A-10, A-7D," <u>AW&ST</u>, 23 (Cannon quote); and Watson, "Close Air Support Aircraft," 40-46. The "attack" situation featured tanks arrayed in a line advance with armored personnel carriers (APCs) and air defense vehicles following. The "breakthrough" consisted of tanks, APCs, and air defense vehicles moving along a road.

<sup>&</sup>lt;sup>52</sup>Adams, interview by author (says that the flyoff was fair, but its setup and questions for the pilots to answer were important to the outcome); "A-7D, A-10 'Fly-Off Suggested," <u>Air Force Times</u>, 29 (Air Force concerns about flying undeveloped A-10 prototypes against the combat veteran A-7); and Watson, "Close Air Support Aircraft," 43-44.

project did not mind competition, obviously, but the introduction of a rejected candidate after they had chosen two other competitors was both an embarrassment and a hindrance.<sup>53</sup>

Further, influential members of Eglin's Armaments Lab wanted the Philco-Ford gun in spite of the fact that the January through April 1973 shooting competition graphically demonstrated that the GE gun was the best. To some members of the Armaments Lab, the Philco-Ford gun represented a more advanced lightweight design, in contrast to GE's more conventional and much heavier weapon. However, Philco-Ford's gun failed miserably. Competition rules required the guns to fire 70,000 rounds, and GE's gun fired its full allotment, while the Philco-Ford model jammed repeatedly and finally fired only 15,000 rounds. A separate test firing of the Oerlikon revealed similar problems as the Philco-Ford model; it repeatedly jammed after firing an average of 842 rounds.<sup>54</sup>

Fredericksen, who was serving as CAS programs monitor in DDR&E at the time of the gun competition, says he welcomed Sprey's influence on behalf of the Oerlikon gun, since it guaranteed competition against what he believes was GE's almost unbeatable weapon. Christie, who was in charge of the Systems Analysis Division of the Armaments Lab, says that Sprey's efforts on behalf of the Oerlikon introduced undue delay. Wall's account and sources indicate that Sprey was involved and that the Oerlikon candidacy caused some discontent. Sprey proudly acknowledges his role, and his assertion about aiming has some validity; see CAPT Sam Walker, USAF, "GAU-8A: High Versus Low Rate," <u>USAF Fighter Weapons Review</u> (Spring 1982): 2-5. Fredericksen and Sprey also liked the fact that it was cheaper, lighter, and an already developed design.

The GE Gatling gun, for example could fire rounds at two selectable rates, two thousand and four thousand per minute. The Oerlikon 304 RK fired rounds at just over thirteen hundred per minute.

<sup>54</sup>Edmund Suydam, "GAU the Giant Killer," <u>National Defense</u> 72 (September-October 1977): 132-133; Wall, 20-27, 30-31; and author interviews of Christie, Fredericksen, McMullen, Oates, Sprey, and anonymous (by request) witness "A." Oerlikon advocates Fredericksen and Sprey concede that the competition was fair. Christie, Dilger, McMullen, Oates, and "A" mention the Eglin Armaments Lab's preference for the Philco-Ford gun and give various reasons for it. Philco-Ford had a large operation at Eglin ("A"). The gun was an advanced design that was lighter than the more conventional GE model, and was supposed to be simpler to maintain (Christie and

<sup>&</sup>lt;sup>53</sup>Wall, "Development and Acquisition of the GAU-8A," ix-xi, 12-23, 32; and the following interviews by author: Christie (in addition to the previously cited interview, this material is courtesy of author's telephonic interview, 26 March 1998, notes in author's possession), Dilger, Fredericksen, Kishline, Oates, and Sprey.

In June 1973, the gun project's DSARC formally announced that GE's candidate won. But the gun, designated the GAU-8A, required substantial development work before it would be a fully functional part of the A-10. For example, contracting negotiations for, and construction of, low-cost but effective 30 mm rounds still remained. Further, the GAU-8A required flight testing aboard its host aircraft. Initial trials in late 1973 revealed no big problems, but more extensive firings in early 1974 featured a continuous secondary ignition of gun gas in front of the plane's nose during firings. The phenomenon occurred due to the propellant's chemical makeup and the fact that some of this material escaped as a hot gas through imperfectly shaped shell rings as they exited the barrel. The problem would be fixed, but both it and the competition deadline meant that the A-10s involved in the flyoff would not carry the weapon.<sup>55</sup>

#### The Flyoff

None of the A-10's other weapons delivery gear would be available either. So, in order to guarantee fairness, weapons effectiveness for both planes would be based upon postulated hits derived from recorded flight parameters matched with the various weapons' known employment envelopes. And since one could not actually shoot down the planes, the air defense assessments would also be simulations derived from tracking data. Further, the attacks on the target arrays would be flown by one aircraft, thus negating any tactical advantages derived from multi-plane attacks. The planes would not carry countermeasures gear against the defenses, either. On the face of it, the test appeared to satisfy a neophyte's view of a fair, head-to-head, competition. Certainly, it was a "test," as recommended by the Senate and GAO, but the restrictions already in place reduced the obtained data's

Oates). Concerning the Philco-Ford gun's fate, Christie, Fredericksen, "A", and Oates observe that it lacked parts and was not developed well enough. "A" and Christie are sources for the Armaments Lab's post-competition preference for the Philco-Ford gun.

<sup>&</sup>lt;sup>55</sup>Wall, 18-20, 28-30, 35-45. Wall notes that the test would evaluate effectiveness against tanks, which excited interest by LTV in a 30 mm gun pod for its A-7. The Air Force rejected the idea because the pod was too big and cost too much, especially since including the Oerlikon gun in the test incurred unexpected costs and effort already.

meaning. These results would still be useful, in their way, and Senator Cannon had told the Air Force that he did not require either a long or complex test. But given that the objective data would be based upon postulations, the four pilots' subjective assessments assumed even greater importance. Then again, Cannon seemed most interested in these.<sup>56</sup>

TAC commander Dixon was quite aware of the significance of the pilots' opinions, as well as the hard congressional scrutiny directed at the Air Force and its flyoff pilots. Just before the test commenced, Dixon informed the pilots that he would not direct their responses. As he later recalled, one of the pilots expressed concern that the Air Force seemed to want the A-10, and that they had better choose it as well. General Dixon said he answered:

The planes carried bombs during the attacks to determine how they handled in such situations, but did not drop them. Using postulations can create suspicions that the parameters are rigged to favor one plane over another. For example, Sprey is considered the "Father of the A-10," but he dismisses this fly-off as biased toward his machine. MAJ Bridges follows this line, somewhat. He writes that he was involved in the flyoff (though he dos not specify his duties), and asserts that though he witnessed a professional and fair effort, he believes that the air defense part of the test could have featured more interaction between the defenses and the pilots flying the planes. For example, the evaluators should have used Army gunners' actual ability to track the planes instead of assuming perfect tracking in all cases; and the pilots should have had radar warning devices and jammers. However, this author believes that this would have introduced too many variables and an ensuing unacceptable level of complexity. Further, it would have violated Senator Cannon's dictum that the test results be based upon unbiased pilots' opinion of the planes. Bridges concedes that the test still yielded enough information to resolve the CAS plane dispute, and even led to quicker resolution of A-10 gun sight and flight control deficiencies. In spite of this, Fairchild's President Ed Uhl thought that the test's conditions were unfair to the A-10! See Edward Uhl, letter to GEN George Brown, USAF, 4 February 1974; and GEN George Brown, USAF, letter to Edward Uhl, 28 February 1974, both letters, supporting documents.

<sup>&</sup>lt;sup>56</sup>Adams, interview by author (observes that Dixon was under great political pressure during this time); Bridges, "Realism," 41-44, 76; GEN George Brown, CSAF (Chief of Staff of the Air Force), to TAC/CC, AFSC/CC, AFLC/CC ("CC" stands for commander), "A-10/A-7 Fly-off Planning," 10 December 1973, supporting documents (contains attachment that delineates the conditions and restrictions of the test; there were a lot of simulations); Headquarters USAF, AF/RDPN, PMD for the A-10/A7D Fly-Off"; Currie Memorandum, 2 October 1973 (requirement to at least address the air defense issue); Freck, "Comparison," 4-22, 36-53; Gieger, "History," 94; Sprey, interview by author; "USAF Agrees to Flyoff for A-10, A-7D," AW&ST, 23; and Watson, 49.
No, no. You didn't listen, and you don't believe me, but I am going to say it again, and you had better believe me. You are going to do this, and you are going to say what you have to say. That is an order .... I assure you if you don't, you are going to suffer the consequences and so am I, because I have assured the Chief of Staff you will, and I have assured Senator Cannon you will. I'm not going to tell you what to say, and if you are waiting for me to tell you, you are going to wait a long ... time, boys.

To further ensure that their operational judgment would remain untainted, the pilots could not talk to each other during the test, and their base location was isolated.<sup>57</sup>

The test commenced in mid April and ended in mid May. In its first phase, the pilots flew the planes and rated their cockpit setup and handling characteristics. The second phase was the most important: it featured the attacks flown by a single plane against the defended target arrays. This phase's results revealed that, in simulated free-fall bomb deliveries, both planes did equally well; the A-10's closer employment ranges offset the A-7's advanced bomb delivery avionics. When making mock Maverick missile attacks, both planes again did equally well, with the test confirming to the Air Force that the Maverick would make a good standoff weapon (though the attacks obviously could not address the difficulties pilots later had with getting the missile to lock on to target). The decisive factor in these weapons effectiveness tests came with the postulated gun attack results. Based upon its much greater hitting power than the A-7's 20 mm gun, the test authorities judged the A-10's GAU-8A a more effective weapon. Concerning battlefield threats, the Air Force had managed to derive information from the Israelis' SA-6 war prizes, and thus learned that missile's radar and missile performance capabilities against the competitors. The Hawk missile crews had no problem tracking the two planes, but

<sup>&</sup>lt;sup>57</sup>Cleary, <u>Dixon</u>, 301, 302 (quote), 303-304. (On page 303, Dixon added that "I also had to call in the contractor[s] and tell them that if they got down there [Fort Riley] and f--ked around and interfered with the operation and did a few other little tricks that contractors are capable of, I would have thrown them off the field."); McMullen, interview by author (emphasizes the unbiased nature of the flyoff and importance of pilots' judgment; remembers that Dixon chided him for trying to give the pilots some A-10 information); and LTGEN Dale Tabor, USAF (ret.), telephonic interview by author, 4 March 1997, notes in author's possession. Tabor was a Major at the time of the flyoff, and was one of the four pilots.

SA-6 postulations revealed that both planes would defeat the missile if they maneuvered and used countermeasures. Similar testing based upon exploitation revealed that the SA-7 was not a threat if the planes used countermeasures. As for the ZSU-23, the A-10 was more likely to be hit due to its slower speed and lower attack altitudes. However, since it was a far more rugged and easily reparable plane, the evaluators rated it an overall more survivable machine against this weapon. Again, use of good tactics and countermeasures probably would help both planes.<sup>58</sup>

Though these results gave the edge to the A-10, the most important result would still be the four pilots' judgment. Retired Lieutenant General Jimmie V. Adams, who as a major served as TAC's project officer for the flyoff, later said that the questionnaire was one of the most important things about the competition--and the first question it asked was whether the plane they flew could accomplish CAS in the often poor European weather. In clear weather with unlimited visibility, the A-7 with its superb weapons delivery avionics was the flyoff pilots' unanimous choice. But as the weather scenario reached the 3000 feet cloud ceiling and 3 miles visibility, one pilot changed his mind and another rated both planes equal. For the 1000 feet ceiling and 2 miles visibility scenario, the pilots' unanimous choice became the A-10. This preference was in spite of the fact that in their assessment of the planes' respective characteristics, they liked the A-7's smoother handling and navigation/weapons delivery avionics (though most conceded that the A-10 was still an undeveloped prototype that could improve). The agility built into the A-10, based upon

<sup>&</sup>lt;sup>58</sup>Freck, and others, "Comparison," 6-22, 40-66; Geiger, et al "History," 95-96; and Watson, "Close Air Support Aircraft," 49-53. Ominously, Freck and company note that the planes' estimated survivability against the Stinger, the U.S. Army's newest shoulderlaunched, heat-seeking missile, was not good if they lacked truly effective countermeasures gear. This missile could be launched against any aspect of an aircraft, not just at its exhaust as for most heat-seekers. It was also much faster and had longer range than an SA-7, and its postulated lethality against the A-7 and A-10 was twenty to thirty times greater than that of the SA-7. It would become the scourge of Soviet attack aircraft during the Russians' war against Afghan rebels during the 1980s, and the report concludes: "Finally, if the enemy were to develop a true Stinger capability, new IR [infrared] countermeasures would have to be developed, because countermeasures effective for the SA-7, such as rearward ejecting flares, would not be nearly as effective against Stinger" (20).

the combat lessons of CAS, paid off at this point. The payoff also appeared in the aircraft characteristics ratings; most of the pilots liked the plane's cockpit visibility and believed that its maneuverability enabled them to acquire and attack targets quicker. As previous studies and tests indicated, the A-7 simply could not maneuver well enough to operate comfortably in a poor-weather CAS environment.<sup>59</sup>

In June 1974, OSD reported that the A-10 was the winner, and Air Force leaders brought the four pilots with them to brief the results to the House Armed Services Committee that same month. The legislators seemed generally satisfied, though one Texas representative wondered why the A-7's combat record did not count toward the selection. Further, another congressman wanted to know what the Air Force thought of the Piper Enforcer, a design based on the World War II P-51 fighter that Piper was then trying to sell as a counter-insurgency and CAS plane (for photo, see Appendix Fig. 42). The legislator alleged that it "could do everything these planes could do, only more cheaply," and thus previewed Congress' use of the Enforcer to threaten the Air Force when the A-10 encountered future developmental problems. And as the House hearings ended, Chairman F. Edward Hebert (D-LA) still seemed interested in the comparative costs of the A-7 and A-10. The lawmakers remained skeptical of the dedicated CAS plane's worth.<sup>60</sup>

<sup>&</sup>lt;sup>59</sup>Freck, and others, "Comparison," Appendix A, A-1 through A-22 (pilot questionnaire and pilots' recorded responses; pilots are not cited by name); and Geiger, and others, "History," 94. The first asked the pilots' preference given decreasing weather conditions--it specifically asked them to envision themselves in a European combat environment. The second asked them to rate the planes' characteristics, with sub-questions asking about handling qualities, ability to acquire targets, cockpit visibility, and ability to take evasive maneuvers. Concerning the last sub-question, two pilots preferred the A-7 since it was the faster plane, and two observed that both planes were underpowered.

A January 1974 <u>AW&ST</u> article stated that the test would "be measured against a standard based upon the A-10A's capabilities." This offset the A-7's advantage of being a fully developed, Vietnam combat-proven weapons system. See "A-10A Capabilities Set Basis for Flyoff," (7 January 1974): 53.

<sup>&</sup>lt;sup>60</sup>Congress, House, Committee on Armed Services, <u>Full Committee Consideration</u> of H.R. 8591, H.R. 11144, H.R. 15406, 93d Cong., 2d sess., 20 June 1974, 16-50 (quote, 29); and author interviews with McMullen and Schlesinger (both remembered some, but not many, complaints by the Texas delegation). The pilots' names and backgrounds are

But in the meantime, the A-X had become the A-10, having experienced review by Senate committee hearings, a flyoff between two A-X candidates, and a flyoff competition against the A-7. The Senate CAS hearings were supposed to reduce the competing CAS aircraft designs to one, but the issue's complexity defeated the senators, and the hearings ended with one more candidate, the A-7. The A-X flyoff was a trial in its way; the Air Force and OSD ran a fair competition to determine the best design, in spite of some political pressure on behalf of the competitors. Congress then forced a flyoff between the A-X flyoff winner and the A-7. Combat results charged the atmosphere for the A-7/A-10

The test did not address the competitor planes' ability to defeat fighter attacks, but in the hearings, Air Force officials cited a study stating that the A-10 was better able to outmaneuver and evade enemy fighters.

Through late spring and early summer, the Air Force and Congress sparred over the implications of the test results. Initially, the service did not announce a clear winner, reflecting its desire to retain a mix of planes. The other reason was that the service was trapped between two factions in Congress: those who wanted it to pick one plane, and the Texas delegation which threatened to block funds for the A-10 in favor of more A-7s. By July, congressional and service compromises having been achieved, the Air Force declared the A-10 the flyoff winner, retained some A-7s, and appeased the Texans. See the following <u>AW&ST</u> articles which recount the minor scrap: "Decision on A-10 Production May Sway Action in Congress," 100 (1 July 1974): 23 (Air Force has announced winner, and apparent congressional compromise that removed wording that would allow Congress to reject the flyoff results); "Flyoff Decision Favoring A-10 Expected," 100 (17 June 1974): 16; and "Lack of Clear Flyoff Decision Could Postpone Funds for A-10," 100 (3 June 1974): 22.

Indeed, the Texas delegation would press the A-7's case for a long time. In 1981, <u>The Washington Post</u> noted that neither the Air Force nor the Navy had A-7s in their budget, but the Texans appropriated money anyway. See "Opponents Find Vought Corporation's A7 Impossible to Shoot Down," 13 March 1981, A3.

included in this hearings document; beyond their combat backgrounds, three were graduates of the Air Force's prestigious Fighter Weapons School and one was a graduate of the service's equally prestigious Test Pilot School. GEN Dixon recalled that, as the pilots testified before the Senate Armed Services Committee, "One of the questions he [Senator Cannon] asked them was, 'Did General Dixon tell you what to tell me?' One of them told me later--he almost died laughing--he was about to say, 'Yes, he did,' meaning 'He told us to tell you the truth,' when suddenly he realized if he said, 'Yes, he did,' that might be as far as he got. So he said, 'No. He didn't tell us what to tell you.''' See Dixon Oral History, 304. Also, both LTGEN McMullen and LTGEN Tabor both say that the first time the pilots learned the results and the other pilots' opinions was when they were presented to Congress; McMullen and Tabor, interviews by author.

flyoff, as many in Congress doubted whether a plane like the A-10 could survive over the modern battlefield. However, by this time, both the Air Force and the Army worried about whether their combined forces were strong enough to stop the Soviets in Europe. As a result, the flyoff was oriented toward operations in the often-poor European weather against armored units, a condition for which the A-10 was designed. The flyoff ended the overt, direct-competition, contests aimed to determine the Air Force CAS plane's fate, but it would not end questions about whether the plane should be built. As the Air Force briefed the flyoff results to Congress, some lawmakers still expressed skepticism about the requirement for the plane as well as its cost. Upcoming and less overt trials would involve the A-10 SPO demonstrating that the plane, its manufacturer, and the Air Force could meet both cost and effectiveness goals. Successfully meeting these challenges would allow the plane to enter the operational inventory as the first dedicated CAS plane in the history of the independent Air Force.

# CHAPTER VII THE A-10'S FURTHER TRIALS, AND ENTRY INTO THE OPERATONAL AIR FORCE, 1974-1983

The A-7 flyoff victory and the Schlesinger-Brown agreement did not end the challenges to the A-10's existence. Skeptics and opponents still existed. However, now the primary threat was not a rival CAS concept or another CAS aircraft. Instead it was the plane's own developmental progress.

The plane encountered problems in several areas: its cost, weight, and gun. All of these invited carping from various quarters. Congressmen who either had dealings with airplane designer David Lindsay, or wanted a cheaper CAS plane, or doubted the A-10's combat prowess, pushed Lindsay's Enforcer attack plane as an A-10 alternative. Though there was no direct flyoff competition, the Enforcer did as its name implied, and helped goad the Air Force to make the A-10 operate and cost as planned.

The A-10 did so. OSD and the Air Force ruthlessly cut any item deemed unnecessary to meet the design-to-cost goal set in 1970. This involved cutting equipment items that later were added to ease the pilot's workload—indeed, some pilots asserted that design-to-cost failed as a program because of the capability penalties that it incurred in the A-10. Nor did Fairchild-Republic escape scrutiny; an Air Force report criticizing its management and construction practices led to organizational changes both at the company and within the Air Force's A-10 SPO. The plane remained slightly overweight, due in part to General Electric's GAU-8A 30 mm gun. Some people did not believe that this weapon would be as reliable, cheap, and effective as claimed. However, aggressive, innovative work on the part of its developers ensured its success.

In March 1976, the A-10 finally joined the operational Air Force. Officially nicknamed the Thunderbolt II in honor of the rugged Republic P-47 Thunderbolt, its pilots acknowledged its ungainly, ugly, appearance by calling it the Warthog. The nickname was one of honor and affection, as the pilots who flew the Warthog became its fiercest defenders. Still, there were skeptics and operational questions to answer. Belying its previous institutional skepticism about such planes, the service strove to prove the plane's worth via equipment upgrades, exercises, and favorable media reports. In this regard, the Army helped the Air Force. The growing climate of cooperation between the two services had already manifested itself in an agreement which acknowledged each service's right to conduct air support with its respective types of aircraft. Further, the Army's new warfighting doctrine, "Active Defense," emphasized heavy firepower directed against a Soviet armored onslaught in Europe. Both services needed the A-10.

In joint exercises, the pilots for both services created a new operating concept, the Joint Air Attack Team (JAAT). JAAT involved coordinated A-10 and attack helicopter attacks that sharply increased kills on enemy vehicles while reducing losses to enemy antiaircraft defenses. One of these late-1970s exercises was a congressionally influenced test to compare attack plane and attack helicopter's fortunes against European--read Yom Kippur War--defenses, the Joint Test of Tactical Aircraft Effectiveness in Close Air Support Anti-Armor Operations (called TASVAL). Though there was some tension between the services during TASVAL, given its possible procurement implications, the test proved that their respective air support machines and pilots worked better together. Also during this time, energetic staffers successfully organized a system for procuring affordable 30 mm rounds, which guaranteed a much cheaper overall program. Further, they conducted firing tests against T-62s captured in the October War to demonstrate conclusively the GAU-8A's value as an antiarmor weapon.

Finally, the A-10 proved itself via its operational deployment. Air Force staffers set up A-10 bases near Army units in the U.S. and the two regions featuring the greatest tension between U.S. and communist forces, Europe and Korea. Most impressive was the European A-10 operation, in which six Warthog squadrons based at Royal Air Force base (RAF) Bentwaters and RAF Woodbridge, England, formed the Air Force's largest tactical fighter wing. From there, A-10 flights routinely deployed to forward bases in Germany to work with their Army counterparts.

The Warthog's future seemed bright, but problems loomed close by. The Air Force considered, and then rejected, a two-seat, night/all-weather A-10 due to its lack of

performance and the problems extant with performing CAS in such conditions with even the most advanced bad-visibility equipment. The service showed no inclination to buy any more than its planned number of A-10s. This was in accordance with the service's normal CAS force structure needs. It also indicated that there was a limit to the service's interest in this mission.

## The Enforcer Interlude

The A-7 flyoff should have been the final challenge for the A-10, but a variety of external and internal factors made the last two years before its operational debut exciting. Several legislators continued attacking the plane from the time of the A-7 flyoff through the end of the 1970s. Some, such as Robert Giaimo (D-CT) and Jim Lloyd (D-CA), opposed the plane due to continuing doubts about its suitability for modern combat. Others, like George Mahon (D-TX), seemed against the A-10 due to resentment over its defeating a Texas-built plane, the A-7, in a flyoff competition. Many others, including Les Aspin (D-WI), Mahon, and influential staffer Anthony Battista, wanted further military procurement cuts and considered the A-10 program, with its escalating costs, a good candidate.<sup>1</sup>

The result was that, by August, the legislators introduced the Piper Enforcer, an even simpler and slower plane than the A-10, as yet another competitor. The Enforcer's creator was politically influential newspaper publisher David Lindsay, and except for the wingtip tanks, and a nose elongation due to its turboprop engine, the plane looked like a P-51. In 1970, he submitted a prototype for consideration in the Air Force's

<sup>&</sup>lt;sup>1</sup>Battista, interview by author; Congress, House, Hearings, <u>H.R. 8591</u>, 49-50; Congress, House, Hearings before a Subcommittee of the Committee on Appropriations, <u>Department of Defense Appropriations for 1975, Part 7</u>, 93rd Cong., 2d sess., 23 May 1974, 1050-1058; William Dickinson, telephonic interview by author, 25 March 1997, notes in author's possession (Democratic Congressman from Alabama during the 1970s; skeptical of the A-10's modern combat suitability); Giaimo, interview by author; Jim Lloyd, telephonic interview by author, 17 March 1997, notes and recording in author's possession; Pike, interview by author; and Price, interview by author.

counterinsurgency/light-attack plane candidate search project, known as PAVE COIN. The Air Force judged the Enforcer "a strong candidate for source selection," but finally rejected it and other candidates in favor of the OV-10 and A-37. The winning planes' capabilities, and the fact that they were already operational, made them the service's choices for the counterinsurgency attack mission.<sup>2</sup>

In an August 1974 special briefing requested by the House Armed Services Committee, Lindsay claimed that he did not want his plane to compete with the A-10. This was not true. Not only did he frequently attack the A-10 then and later, but an <u>Aviation Week & Space Technology</u> article appearing that same August cited his contempt for the A-10 and desire for an A-10/Enforcer flyoff. The congressmen ably abetted him, in that they were upset with the A-10 program's costs and lingering uncertainties. At the start of the briefing, the chairman of the subcommittee convened to hear it, Melvin Price (D-IL), submitted for the record letters from other congressmen--one was Armed Services Committee Chairman F. Edward Hebert (D-LA)--criticizing the A-10 for cost overruns and suggesting the Enforcer as a cheap alternative. The congressmen's leading questions, as well as his own apparent strong desire to secure government purchase of his plane, led Lindsay to shed his initial reluctance about publicly endorsing the Enforcer over the A-10.<sup>3</sup>

<sup>&</sup>lt;sup>2</sup>J. Lynn Helms, telephonic interview by author, 23 April 1997, notes and recording in author's possession (Helms was President of Piper Aircraft Corporation during the 1970s; believes that the Air Force also preferred the AC-130 for counter-insurgency warfare); Jacquelyn Porth, "Enforcer Out of Mustang Came," <u>Defense & Foreign Affairs</u> (October 1981): 6-14 (notes the Mustang connection); Clarence Robinson, "Flight Test Program Sought for Enforcer," <u>AW&ST</u> 101 (12 August 1974): 50-55 (recounts how Lindsay modified P-51s that he owned, and then derived the Enforcer design from the Mustang); U.S. Air Force, Project PAVE COIN, "Forward Air Control (FAC) and Light Strike Aircraft (LSA) Evaluation Report," Task No. 327, Project 1559, P.E.-647085, September 1971, iii-xv, 153-204 (quote, 162), AFHRC Holding K143.054-2.

<sup>&</sup>lt;sup>3</sup>Congress, House, Hearings before the Committee on Armed Services, <u>Military</u> <u>Posture and H.R. 3689 [H.R. 6674]</u>, <u>Department of Defense Authorization for</u> <u>Appropriations for Fiscal Year 1976 and 1977</u>, <u>Part 4</u>, 94th Cong., 1st sess., 9 April 1975, 5151 (Linday asserts no contest with A-10), 5154-5155 (Lindsay and congressmen challenge A-10); Congress, House, Subcommittee No.1 of the Committee on Armed Services, <u>Briefing on the Military Airlift Capability during the Middle East Conflict and</u>

Indeed, the reluctance further decreased as the congressmen repeatedly invited Lindsay and Piper Aircraft Corporation President J. Lynn Helms to present their plane's case specifically against the A-10. They returned in 1975, 1977, and 1978. The 1977 hearings alone spent 125 pages of testimony and featured a congressionally orchestrated debate over the A-10 and Enforcer's relative merits between Lindsay and Helms on one side, and Air Force general officer witnesses on the other. A key reason for their continued popularity was Senator Strom Thurmond, who had political connections to Lindsay. Other congressional support, such as that from Congressman Les Aspin and Senator William Proxmire, was due to a simplistic desire for ever cheaper planes. These lawmakers ignored performance deficiencies that would generate even more spending either to make the planes fit for combat, or to procure more of them to do the same job as

Lindsay's shift to comparisons to the A-10 in the 1974 congressional briefing is on 8-9 (at first sees Enforcer as a complement to the A-10), 19-21, 32-35 (asserts Enforcer's superiority to A-10 in projected European conflict). Lindsay also complained about the Air Force's judgment against his plane in the PAVE COIN test, 22-23.

Enforcer Aircraft, 93rd Cong., 2d sess., 8 August 1974, 2-40; Congress, Senate, Hearings before the Committee on Armed Services, Fiscal Year [FY] 1978 Authorization for <u>Military Procurement, Research and Development, and Active Duty, Selected Reserve,</u> <u>and Civilian Personnel Strengths, Part 7</u>, 95th Cong., 1st sess., 16 March 1977, 5141-5155 (Lindsay testimony attacking A-10 and praising Enforcer); Porth, "Enforcer Out of Mustang," 8 (notes that Lindsay came to see Enforcer acceptance more as a matter of pride than of financial gain; he was independently wealthy and not directly employed by Piper); Robinson, "Flight Test Program Sought for Enforcer," <u>AW&ST</u>, 50-55.

Even in later hearings, Lindsay and Piper President Helms commenced their testimony with an assertion that they were not competing with the A-10. In the 1975 House hearings, <u>Military Posture and H.R. 3689</u>, Lindsay said, "At no time did we seek to attack the A-10 aircraft. The decision to pit up against the A-10... was that of the Air Staff" (5151). In the 1977 Senate hearings, <u>FY 78 Authorization, Part 7</u>, Helms asserted that "we have never, and do not now, suggest that the Enforcer can and should replace the A-10" (5165). And in the 1978 House hearings, <u>Enforcer Aircraft</u>, Helms repeated, "I wish to emphasize in the strongest possible way that this is in no way meant to be a critique of or comparison with the A-10" (11).

Lindsay also gave confusing statements about the Enforcer's P-51 lineage. In the 1977 Senate Hearings, Lindsay asserted that "the Enforcer is not a P-51. I cannot stress that enough gentlemen" (5143). Yet, news articles included in the hearings' report mention how he derived the plane from that very design (5196-5200; not to mention Porth's "Enforcer Out of Mustang," 6-8.

fewer A-10s. Some congressmen considered offering it to the Army if the Air Force resisted, but the Army backed away, apparently fearing another roles-and-missions fight.<sup>4</sup>

<sup>4</sup>Jack Anderson, "Secrets Leak Out of Foggy Bottom," <u>The Washington Post</u>, 23 August 1980, E3 (notes Thurmond's support); MAJ Lloyd Bryant, USAF, and MAJ Thomas Dapore, USAFR, A Man for the Time: An Oral History Interview with Lieutenant General James T. Stewart (Fairborn, Ohio: Aeronautical Systems Division [ASD] Historical Office, 16 October 1983), 95-96, transcript, AFHRC Holding K239.0512-1927 (former ASD commander talks about Strom Thurmond and political push for Enforcer); Congress, House, Hearings, Military Posture and H.R. 3689, Part 4, 5150-5169 (in this hearing, the lawmakers allowed Lindsay to present his case with no opposition--except for Congressman William Dickinson [D-AL], who pressed Lindsay hard on his financial claims); Congress, House, Hearing before the Research and Development Subcommittee of the Committee on Armed Services, Enforcer Aircraft, 95th Cong., 2d sess., 22 June 1978, 3-4 (Lloyd's discussion of A-10/Enforcer issue); GEN Wilbur Creech, USAF (ret.), telephonic interview by author, 30 March 1997, notes and recording in author's possession (Creech commanded TAC from 1978 to 1984); LTGEN McMullen, interview by author; Crosby Noyes, "Taxpayers Deserve Test of Less Expensive Plane," Washington Star, 18 November 1975, reprinted in Congress, Senate, Hearings, FY 78 Authorization, Part 7, 5199; and the following previously cited interviews by the author: Battista, Christie, Fredericksen, Helms, Lloyd, Myers, Pike, and Sanator.

In the 1977 Senate Hearing, FY 78 Authorization, Part 7, 5204, Thurmond gushed over Helms' Enforcer briefing: "I wish to state that in my judgment, I have never heard a more convincing or more effective presentation in the 22 years that I have been in the Congress of any defense weapon, Mr. Helms, than you made this morning" (5204). Anderson, Battista, Christie, Creech, and Myers all note that Senator Strom Thurmond was a firm source of Enforcer congressional support and/or note political connections (Myers told the author that Lindsay had "clout"). Helms told the author that Thurmond was upset with the Air Force because he thought that the service had lied to him concerning comparative performance and cost figures between the Enforcer and the A-10. After Lloyd entered Congress in 1975, he supported the Enforcer because he believed the A-10 was still too vulnerable a plane for the money spent on it. Pike supported it because of his desire for the best counterinsurgency weaponry. The Noyes article mentions that, in 1974, Senators Goldwater and Cannon followed the Air Force's wishes and cancelled Enforcer test funding.

Creech recalled the Enforcer's popularity with those who favored cheaper, simpler fighters, but Lindsay's plane actually split some of the Fighter Mafia group. Chuck Myers, who at the time served in DDR&E as Director of Air Warfare, thought the Enforcer was a great plane (in fact, the Robinson <u>AW&ST</u> article noted OSD's conclusion that the Enforcer's performance matched Lindsay's claims). However, Christie who was at the Eglin Armaments Lab, and Fredericksen, who was in OSD Systems Analysis, did not support the plane.

Congressmen's intent to offer the Enforcer to the Army and the Army's reluctance

If Lindsay and Helms thought that congressional interest and attacking the A-10 would obtain an Enforcer government contract, they were wrong. Neither Congress nor the Air Force ever seriously pursued buying it. The Enforcer might have been good for small-scale, counter-insurgency wars, but it could not compete with the A-10 for CAS prowess in all situations. Air Force witnesses testily pointed out that the Enforcer's maximum ordnance load was only a fraction of what the A-10 carried. When Lindsay's creation carried no ordnance, it was already slightly slower than the "slow" A-10--and later studies revealed that ordnance carriage indeed incurred serious maneuvering performance penalties. The Air Force men also criticized its durability. To obtain an unbiased assessment, they deliberately disregarded the P-51's difficulties with CAS-related battle damage in past wars, and still found the Enforcer highly vulnerable to any battle damage. Among other things, it lacked redundant controls, and its ceramic armor did not match the A-10's titanium armor.<sup>5</sup>

<sup>5</sup>GEN Lew Allen, USAF (ret.), telephonic interview by author, 3 April 1997, notes in author's possession; Battista, interview by author; Congress, House, Briefing on Military Airlift and the Enforcer, Attachment I, 12-15, 19 (disingenuous comparison on range); Congress, House, Hearings before the Committee on Armed Services, Military Posture and H.R. 3689, 5163 (Lindsay attacks PAVE COIN findings, but figures bear out Air Force); Congress, Senate, Hearings before the Committee on Armed Services, FY 78 Authorization, Part 7, 5140 (Air Force Deputy Chief of Staff for Research and Development, GEN Alton Slay, summarizes Air Force position, which agrees with Enforcer advocates' performance claims; but says that A-10 is more survivable and lethal), 5205-5251 (Helms and Lindsay debate Slay and A-10 SPO chief, BGEN Jay Brill; Air Force rebuttal documents performance and vulnerability); 5220, 5244-5251 (Slay testimony features competitive bidding, P-51's CAS history discarded, and Enforcer weapons carriage maneuverability problems); Creech, interview by author (TAC commander from 1978 through 1984, said that neither the Air Force nor Congress seriously wanted the plane); and U.S. Air Force, PAVE COIN, "Evaluation Report," 157-171 (Enforcer had strengths but required further development work to be acceptable).

Allen was Air Force Chief of Staff from July 1978 through July 1982, and said that the Enforcer was never a serious contender. Perhaps as proof, he could not remember much about it.

is from Congress, Senate, Hearings, <u>FY 78 Authorization, Part 7</u>, 5216-5217; "House Unit to Urge Enforcer Flight Test," <u>AW&ST</u> 101 (23 September 1974): 27; and Robinson, "Flight Test Program Sought," <u>AW&ST</u>, 50-55.

Lindsay and Helms tried to rebut these assertions by playing up the Enforcer's strengths. First, it was cheaper than the A-10. The plane had exceptional loiter performance and handled better on unpaved runways. It carried a remarkable amount of ordnance for its size, and Lindsay and Helms made all sorts of promises through the years about what weapons it could be adapted to carry. They emphasized that its small size made it less vulnerable to air defenses, especially against radar weapons. But their testimony often became special pleading as they shifted the terms of their argument to make the best point and perhaps swing the sale. As Air Force leaders made clear, the plane was simply not the optimum design for CAS, especially European CAS. Concerning vulnerability, they explained that the Enforcer's propeller was a natural radar reflector, and that vulnerability to hits was not only a factor of size but more importantly, what there was inside the plane to hit and how well internal components withstood hits. The Enforcer's airframe did not have the A-10's backup systems and ruggedness. Lindsay and Helms complained about the PAVE COIN evaluation during these hearings, but PAVE COIN identified as many developmental problems as currently vexed the A-10. The A-10 had already achieved two flyoff successes, and yet its developmental glitches spurred hearings on behalf of another potential competitor, the Enforcer. As such, the Air Force representatives pithily observed that, if the Air Force wanted such a plane, it would have to accept competitive bidding and the Enforcer might lose to some other aircraft.<sup>6</sup>

<sup>&</sup>lt;sup>6</sup>Congress, House, <u>Military Airlift and the Enforcer</u>, 8-9, 17-21, 25-27, 34-35 (Lindsay and Helms assert, erroneously, that the A-10 could not fly from unimproved fields, but it could; see Congress, Senate, <u>FY 78 Authorization, Part 7</u>, 5220, 5225), 37-39 (sweeping claims for Enforcer's ordnance carriage potential); Congress, House, <u>Military Posture and H.R. 3689, Part 4</u>, 5151-5169 (5162, Lindsay claims that the PAVE COIN test limited the Enforcer's maximum maneuverability envelope in demonstration exercises, but cites minuscule weapons loads carried for these maneuvers; thus, he inadvertently demonstrates the plane's limitations); Congress, House, <u>Enforcer Aircraft</u>, 5-21 (attacks previous Air Force rebuttals, as well as the service leaders' assertion that competitive bidding is required for an Enforcer-type aircraft), 140-153 (discussion of lack of foreign sales possibilities--the State Department was an obstacle); Congress, Senate, Hearings, <u>FY</u> <u>78 Authorization, Part 7</u>, 5141-5155 (Lindsay testimony), 5155-5162 (testimony of Andrew Baker, who helped create the Enforcer's ceramic armor), 5162-5204 (Helms briefing, and inclusion of pro-Enforcer press articles), 5241-5243 (further argument by

Lindsay and Helms, with an able assist from Thurmond, at least secured an Air Force flight test for their plane in 1984, but the service delivered the same findings as before. The Enforcer was a good machine, but not as good as the A-10 for CAS—and the service did not need another counter-insurgency aircraft.<sup>7</sup> If nothing else, they made a remarkable effort to secure a government contract—a struggle made more desperate by the fact that they found no foreign buyer. Their hearings testimony featured impressive double-talk and a remarkable ability to tactically argue both sides of various issues in order to sway the legislators. The congressmen's motives were fair neither to true circumstances nor to the active players involved. Senator Thurmond pushed a political favorite's plane as far as he could, while other legislators shopped for weapons bargains by playing a

<sup>7</sup>The Enforcer's 1984 fate is from COL Marvin Bass, USAF (ret.), telephonic interview by author, 7 July 1998, notes in author's possession; The Honorable Verne Orr, letter to The Honorable Strom Thurmond, 27 March 1981, Verne Orr Papers, AFHRC Holding K168.7270-28; Verne Orr, telephonic interview by author, 12 June 1997, recording and notes in author's possession; and the following previously cited author interviews: Creech, Helms, and McMullen.

Orr was Air Force Secretary at the time of the test, and reported that political pressure was ongoing even in the early 1980s. This fact is confirmed by Orr's reply letter to Thurmond assuring the senator that Orr "is keeping on top of the Enforcer program." The test report is still classified, but Orr said that it revealed nothing new. Further, Bass was a TAC staffer assigned to monitor and report on the test, which involved noting the plane's performance and ability to carry and deliver certain types of ordnance. His general observations matched earlier assessments. It could not carry much ordnance without suffering serious performance penalties, and interestingly, pilots still could not see targets over the plane's long nose.

Lindsay and Helms); U.S. Air Force, PAVE COIN, "Evaluation Report," 163 (weak roll response and no redundant controls), 164 (modifications to landing gear required), 165 (Enforcer has weapons carriage versatility, but gun sighting problems due to long nose), 168 (unknown tip tank performance), 186 (Enforcer "weaknesses" include insufficient cost estimates by Piper).

In his bid to demonstrate that the Enforcer had the same lethality against tanks, Lindsay claimed that recoilless rifles could be attached to his plane. What Lindsay failed to mention or did not know was that, in 1970, the Air Force Close Air Support Gun System Study Group that decided upon the A-X gun design rejected recoilless rifles due to their poor accuracy and slow firing rate. See Congress, Senate, Hearings, <u>FY 78 Authorization</u>, <u>Part 7</u>, 5196, 5201, Fredericksen, interview by author; Sprey, interview by author; and Wall, "Development and Acquisition of the GAU-8A," 3-4.

simplistic unit cost comparison game. They liked the Enforcer's projected cheaper price tag, but disregarded the required development work--with the associated cost escalation--to yield a machine lacking the A-10's performance, adaptability, weapons carriage, lethality, and durability. Even more remarkable in this regard was the fact that the A-10's total cost, with alleged small cost overruns, paled in comparison to other jets procured at this time, such as the B-1, F-14, and F-15. One had to conclude, as two observers close to the scene have, that the lawmakers did with the Enforcer as its name implied and pushed the Air Force to guarantee the A-10's planned performance and cost. In so doing, the congressmen also created a lot more work than was perhaps necessary for those on both sides of this debate.<sup>8</sup>

Examples of Lindsay and Helms' behavior from the hearings and other sources follow, with parenthetical references. Already noted are their misleading statements regarding the Enforcer's lineage, recoilless rifles, and their intentions regarding the A-10. In his 1975 House Hearings testimony, Lindsay concluded by observing that the A-10 weighed as much as some World War II bombers but lacked those planes' gun turrets and rearward lookout (5168). Apparently appealing to the lawmakers' simplistic attitudes about cost and combat aircraft capabilities, his story ignored tactical planes' dramatic increase in size and performance since that war. He also knew nothing of the A-10's cockpit visibility, for it was designed with good cockpit vision in mind. The most spectacular examples of misleading testimony came in the 1977 Senate hearings. Helms over-simplified the vulnerability issue to one of size, opening himself to sharp rebuttals from GEN Slay (5172-5183, 5206-5214, 5221-5223, 5248). Senator Thurmond and Helms agreed that the Enforcer could fire the Maverick missile, even though the plane was not then configured to carry the weapon (5205-5206). Further, Lindsay and Helms erroneously extrapolated chart data and took Air Force performance statements out of context to make their plane appear competitive with the A-10. However, they could not mask the fact that the Enforcer carried only a fraction of the A-10's ordnance load. Further, in arguments over the two planes' combat range, they avoided saying that the Enforcer lacked air-to-air refueling capability. Finally, Lindsay asserted that the 30 mm Aden (DEFA) gun was as lethal as the GAU-8A, but in a previous chapter, this work points out the Aden gun's known Six Day War shortfalls (5183, 5188-5189, 5225-5227, 5250-5251). When Senator Goldwater pressed Lindsay about Enforcer performance deficiencies versus the A-10,

<sup>&</sup>lt;sup>8</sup>Sources for Piper's inability to secure foreign sales are Congress, House, Hearings, <u>Enforcer Aircraft</u>, 142-147; and Porth, "Enforcer Out of Mustang," 9 (notes that many nations would not buy American planes that the U.S. military would not buy). The two observers' conclusion about the legislators' ultimate motives is from author interviews with Battista and Christie. Battista is a good source, because he was a staffer in the 1974 House briefing and 1978 House hearings.

# A Challenge from Within the Project

Though the A-10 was indeed nowhere near as expensive as the B-1 or F-15, whose per-unit costs were over \$60 million and \$15 million, respectively, questions about its cost made it vulnerable to initiatives by such people as Lindsay, Thurmond, and Lloyd. As Congressman Giaimo told DDR&E Director Malcolm Currie in hearings one month before the A-10's operational debut: "I remember when this plane was first sold to us ... one of the real key things about it was the reasonableness of the plane. [Now] It is already up to \$3.6 million." This was the rub; depending upon how one did the accounting, A-10 per-unit expense either hovered around the design-to-cost \$1.7 million goal or had done like other current designs and encountered unwanted overruns. The design-to-cost estimate accounted for inflation and other outside influences upon the original 1970 figure; but some estimates, based upon later costs, put the A-10's cost at Giaimo's \$3.6 million and even over \$4 million. Lindsay and Helms used the inflated figures in their congressional testimony. Determining and later defending the design-to-cost figure was tough, given such factors as political and defense trends, inflation estimates, evolving demands, life cycle estimates, and varying fuel, labor, and parts costs. Facing tough congressional questioning about the A-10's original cost estimate, Air Force General Alton Slay said that "in 1970, we didn't know too much about how to do design-to-cost analysis."9

Lindsay replied that "the aircraft were not designed to the same specifications" (5242). This comment came after nearly one-hundred pages of unfavorable comparisons of the A-10 to the Enforcer in the European CAS mission. In his 1978 testimony, Helms appealed to the Israelis' opinions and the Yom Kippur experience. He noted that the Israelis did not believe that any aircraft could perform CAS against the defenses they faced early in the war, but after the defenses were taken out, most any aircraft could. Therefore, the Enforcer could fly CAS more cheaply in such a situation, and a flying tank like the A-10 was unnecessary (5-6, 9).

<sup>&</sup>lt;sup>9</sup>Congress, House, Hearings before a Subcommittee of the Committee on Appropriations, <u>Department of Defense [DoD] Appropriations for 1975, Part 7</u>, 93rd Cong., 2d sess., 23 May 1974, 1050-1058 (congressional concerns about A-10's developmental costs, and Air Force Deputy Chief of Staff, GEN William Evans' observation that costs will increase if interludes such as flyoffs throw the developmental schedule off track); Congress, House, Hearings before a Subcommittee of the Committee on Appropriations, <u>DoD Appropriations for 1977, Part 3</u>, 94th Cong., 2d sess., 1 March

The Air Force stuck to its assertion that, if the plane was over its cost goal, it was not by much. Nonetheless, congressional attention left the service quite aware of the peril created by any sort of cost inflation. For example, in the Milestone IIIA review after the A-7 flyoff, the DSARC members discussed the A-10's developmental problems and potential cost overruns. The Deputy Secretary of Defense, William Clements, approved the DSARC's findings, which included a limited buy of fifty-two planes, but stipulated that the A-10 project had to conduct various handling tests and demonstrate the functionality of its GAU-8A gun. The aircraft handling issues resolved themselves well enough, but the gun's performance became the most critical factor in the project's survival, and it took a while to demonstrate its worth. And as the service continued work upon the gun, it

Congress' auditing body later admitted that design-to-cost was a complex goal to meet. In a 1978 letter to the Secretary of Defense, the GAO reviewed various military design-to-cost programs, including the A-10, and found that initial estimates were too simplistic, and too short-sighted. The letter cited the A-10 as an example of the latter pitfall, in that program managers actually traded away performance enhancements in order to meet specific short-term financial limits. Of course, GAO did not mention that the service set harsh design-to-cost limits because of hard congressional attention. See R.W. Gutmann, Director, Procurement and Systems Acquisition Division, GAO, to The Secretary of Defense, 20 March 1978, B-163058, copy in author's possession.

Lindsay and Helms references to A-10 costs are in Congress, House, Hearings, <u>Military Posture and H.R. 3689</u>, 5154; Congress, House, Briefing, <u>Military Airlift and The</u> <u>Enforcer Aircraft</u>, 9; and Congress, Senate, Hearings, <u>FY 78 Authorization</u>, <u>Part 7</u>, 80 (in these proceedings, Helms asserted that the A-10 cost \$6.3 million per plane).

<sup>1976, 121-123 (</sup>questions about A-10 cost and performance, and Giaimo quote, 123); Congess, House, Hearings before a Subcommittee of the Committee on Appropriations, <u>DoD Appropriations for 1977, Part 5</u>, 94th Cong., 2d sess., 8 March 1976, 104-112 (hard questions about A-10 cost hikes and performance shortfalls, and GEN Slay's answer concerning developmental and design-to-cost pitfalls, 110); Congress, Senate, Hearings before a Subcommittee of the Committee on Appropriations, <u>DoD Appropriations for Fiscal Year 1976, Part 4</u>, 94th Cong., 1st sess., 26 February 1975, 324-325 (aircraft cost estimates); and Odgers, "Design-to-Cost, The A-X/A-10 Experience," 24 (Odgers was formerly on the A-X SPO, and observes that, although the design-to-cost concept had to account for many complex variables and still needed work, it instilled cost discipline upon the project players); and "Some Fun Program Working Paper," Headquarters Air Force staff paper spoof, supplied by LTCOL Thomas J. McGrath, USAF (ret., and former staffer) to author (the piece lampoons funding complexity).

attended to another concern that abruptly surfaced: the performance of the primary contractor, Fairchild-Republic.<sup>10</sup>

In summer 1974, with Congress upset over the A-10's cost and David Lindsay hawking the Enforcer, the service scrutinized difficulties with Fairchild concerning its operational efficiency. As the Air Force Systems Command's historian of this phase of A-10 development wrote, the biggest problem was that the company had not undertaken an aircraft project of this size in some time. This created various problems, to which the service demanded corrective action. One of these was the Air Force's desire to move at least some A-10 construction to the company's Hagerstown, Maryland, plant, where the service believed that better production facilities existed. When Fairchild rejected Air Force queries on this matter, the service sanctioned a study by current TAC Vice Commander and former chief of the A-7 project, Lieutenant General Robert Hails, which focused upon the company's organizational setup.<sup>11</sup>

The other items to be tested were the plane's air loads and performance, stall performance, spin avoidance capability, engine performance, in-flight refueling, and external stores certification.

<sup>11</sup>LTGEN Robert Hails, USAF, "Report Relative to Production Readiness Posture of the A-10 Program, 4-30 September 74," n.d., 3-4, Part I, 19-35 (this report will henceforth be called the Hails Report), supporting documents; and Watson, "Close Air Support Aircraft," 65-66. Watson gives the impression that the service was mostly

<sup>&</sup>lt;sup>10</sup>The following sources are from Systems Command supporting documents: William Clements, Deputy Secretary of Defense, "A-10 Production Decision," Memorandum for the Secretary of the Air Force, 31 July 1974; Chief of Staff, Air Force (CSAF), "A-10 Production Approval," Message to Major Commands, date-time-group (DTG) 312150Z JUL 74; Defense Systems Acquisition Review Council, "DSARC IIIA Review of A-10 Aircraft Program," 9 July 1974, 1-7; Headquarters U.S. Air Force, "Report of the Program Management Review of Aircraft Gas Turbine Engine Acquisition and Logistics Support," February 1976; and Arthur Mendolia, Assistant Secretary of Defense, Installations and Logistics, "A-10 Close Air Support Aircraft Program," Memorandum for the Secretary of Defense, 26 July 1974, (Mendolia chaired the DSARC's Milestone IIIA meeting, and this is record of it). The other sources are from Systems Command History Office: U.S. Air Force Systems Command, "History, 1 July 1974-30 June 1975," n.d. 255-257; U.S. Air Force Systems Command, "History, 1 July 1975-31 December 1975," n.d., 79; and Watson, "A-10 Close Air Support Aircraft," 55, 57-59.

Hails' group conducted its investigation throughout most of 1974, and its objective findings were harsh for Fairchild. The ensuing Hails Report, as it was known, criticized company managers for their inexperience in handling a project of this magnitude. The top management did not oversee the operation well enough, and thus created confusion about responsibility at the lower levels. As a result, Fairchild lost control of the pricing and delivery of subcontractors' goods. Further, both the machinery and skilled work force were getting old. This meant that the company faced problems with equipment reliability and, as the workers retired, work force competence. Many people who comprised the skilled labor force were aging as well, and their expected retirements threatened the company with even more production problems in the future.<sup>12</sup>

The Hails Report shook Fairchild throughout late 1974 and early 1975, as the company changed top-level managers and streamlined its responsibility and communications channels. More manufacturing went to Hagerstown, but not as much as

<sup>12</sup>Hails Report, Parts I, II, and III, supporting documents; John McLucas, Secretary of the Air Force, letter to Senator John McClellan, n.d., supporting documents; LTGEN Thomas McMullen, interview by author; Dr. Robert Sanator, interview by author; MGEN John Toomay, USAF (ret.), telephonic interview by author, 5 March 1997, recording and notes in author's possession; and Watson, "Close Air Support Aircraft," 67-89 (outstanding synopsis of the Hails investigation and results, given the issues and actions involved).

McLucas' letter was a response to McClellan's questions about the Hails investigation, and describes the issues and people involved. McMullen said that Fairchild's Farmingdale facilities were poor and that those at Hagerstown were not much better. Sanator was Fairchild's Director of Technical Development during this time, and later moved through a variety of positions to company president in 1983. He recalled that lack of major program experience caused many problems. Toomay worked technology development issues on the Air Force Pentagon staff in the 1970s, and later chaired Air Force Scientific Advisory Board studies. He observed that Fairchild-Republic's construction practices and equipment were antiquated.

concerned with Fairchild's recent combat plane production experience. Though the author agrees that this was the root cause of the Hails investigation, the study's timing leads the author to believe that the actual spark for it came due to outside pressures about the budget. After all, the Air Force would have known about Fairchild-Republic from the start, and could have conducted an investigation much earlier. It certainly could have been an issue during one of the flyoffs. Indeed, the Hails report mentions that the company induced delays and cost overruns due to its organizational shortcomings (35).

originally planned. Fearing the loss of constituents' jobs, the New York congressional delegation pressed the Air Force to reexamine its findings, which led to its conclusion that the move would not be as profitable, after all. The management changes and improvements on the factory floor led to an operation which could compete with that of any other aerospace company. Finally, there were shakeups on the Air Force side as well. The service revamped the official relationship between the A-10 project office and the Air Force corporate liaison office to ensure better responsiveness and understanding. And though the action was considered non-punitive, Air Force Chief of Staff General David Jones removed Brigadier General Thomas McMullen as head of the A-10 SPO and replaced him with Brigadier General-select Jay Brill. There were other personnel additions to the Air Force A-10 SPO, and one of them was a hard-charging fighter pilot, Colonel Robert Dilger, who oversaw A-10 armaments issues. Dilger was already a seasoned veteran of A-10 gun debates due to his previous job handling gun development projects at Headquarters Air Force staff. Others had important roles in ensuring the GAU-8A's success. Colonel Samuel Kishline, the A-10 SPO Deputy Director, was such a one, and Lieutenant Colonel Ronald Yates, the Director of A-10 Development Test, was another--but Dilger would be the standout.<sup>13</sup>

Interestingly, one Hails Report finding criticized government efforts to meet design-to-cost goals and ensure the best CAS plane through flyoffs. Both the report and Air Force congressional testimony pointed out that disruptions in the form of

<sup>&</sup>lt;sup>13</sup>Thomas Downey, telephonic interview by author, 20 March 1997, recording and notes in author's possession (Democratic congressman from New York at the time); COL Kishline, interview by author; LTGEN Thomas McMullen, interview by author; Dr. Robert Sanator, interview by author; Watson, "Close Air Support Aircraft," 67-89; and Warren Wetmore, "A-10 Program Approach Reshaped," <u>AW&ST</u> 102 (10 February 1975): 44-47.

McMullen said that GEN Jones told him his relief was due more to a desire to clear the air, His career continued and he was later Vice Commander of TAC. Sanator believed that McMullen's relief was more due to unfortunate timing than any particular failing. Watson notes that the Air Force initially cited comparative labor costs as another reason for relocating production to Hagerstown, but the congressionally driven review of its figures indicated that savings would be minimal.

congressionally directed flyoffs cost Fairchild time and money for development. Further, these sources and later studies criticized the headlong push to meet design-to-cost goals for inducing performance penalties not only upon Fairchild management practices but also upon the A-10 itself. The A-10 that entered the operational inventory in 1976 lacked an inertial navigation system and associated heads-up display, chaff and flare antiaircraft countermeasures dispensers, and a proper flight control augmenter. The service considered these worthwhile sacrifices until the plane achieved final acceptance; after all, it was still not a high priority program such as the B-1 or F-15. As mentioned, the July DSARC listed several items requiring demonstration, but the gun performance and cost items were most important. As the service worked through 1974 and early 1975 to resolve Fairchild's problems, it also had to work to prove the A-10's gun.<sup>14</sup>

# The Gun Proves Itself

Clements and the DSARC specifically wanted the gun to demonstrate reliability, effectiveness, and ability to meet cost goals. Their reasoning was good, because the General Electric GAU-8A gun comprised not only the lion's share of the A-10's attack

<sup>&</sup>lt;sup>14</sup>Hails' observation matched that of the later R.W. Gutmann GAO letter. Other sources for this paragraph are Bridges, "Realism in Operational Test," 44 (notes that A-7 flyoff hurt the A-10's test schedule); Carleton, "The A-10 and Design-to-Cost," 6-11, 16-21; Congress, House, Hearings, <u>DoD Appropriations for 1975, Part 7</u>, 1050-1053, 1057-58 (GEN Slay responds to congressional questions about slight deficiencies in the A-10's takeoff/landing and loiter capabilities by saying that cost constraints do not allow meeting the precise stipulations); Congress, House, Hearings, <u>DoD Appropriations for FY 1976, Part 4</u>, 72, 325; Hails Report, 12-13, 65, 68; and GEN Welch, interview by author.

In the Senate hearings, Air Force Secretary McLucas testified: "The A-10 is the first aircraft to which we applied the design-to-cost concept. We set a limit. We said the airplane will not be allowed to cost more than that. If people think of wonderful things to do to improve it, we are not interested" (72). Welch said that removal of radar range device for aiming the gun was another casualty of design-to-cost; but that since A-10 was a low priority project with several enemies, design-to-cost stuck. The flight control augmenter mentioned was in fact called a stability augmentation system. Its purpose was to coordinate rudder movement with aileron movement so that turns and other maneuvers were coordinated properly.

capability but also the A-10 itself. From the earliest developmental stages, the designers intended for the gun to be the plane's primary tank killing weapon. Its complete barrel, engine, and magazine apparatus was bigger than a Volkswagen Beetle car. It was one reason for the weight increase and corresponding flight performance decrease that caused congressional carping.<sup>15</sup>

From late 1974 through 1975, the Air Force and General Electric tackled the reliability issue head-on. GE successfully conducted a fifty thousand round test of a GAU-8A in various environmental conditions, including salt fog, dust, humidity, and extremes of temperature. The service fired GAU-8As using various types of rounds. In all cases, it did well.<sup>16</sup>

Verifying the GAU-8A's weapons effectiveness required overcoming various difficulties. The ammunition initially used in aerial firings created a critical problem. The secondary ignition of gun gas in front of the plane's nose disrupted airflow to the engines, threatened to blind the pilot during night firings, and even scorched the cockpit windscreen on one test flight. Also, some people wondered about the safety, feasibility, and costs surrounding the production, stowage, and use of depleted uranium armor piercing shells. Friction came from the armaments laboratories. The Army's Ballistic Research Laboratory (BRL) was involved with the GAU-8A project as part of the Defense Department's Joint Technical Coordinating Group, and questioned whether a 30 mm gun really could destroy a tank. As Colonel Dilger later wrote, people wondered that, if tanks used guns of over 100 mm barrel bore displacement to destroy other tanks, what could a gun of one-fourth that displacement do? Along with this sensible skepticism went more parochial motives, such as fear of what a successful 30 mm aerial gun would do to Army tank procurement efforts. Both BRL and Eglin Laboratory wanted controlled firings of single rounds against

<sup>&</sup>lt;sup>15</sup>COL Robert Dilger, USAF, "Tank Killer Team," <u>National Defense</u> 71 (November-December 1976): 190-191 (page 191 has a picture of the GAU-8A sitting next to, and dwarfing, a Volkswagen Beetle); and Wall, 30, 37, 63-64.

<sup>&</sup>lt;sup>16</sup>Geiger, and others, "History of the Aeronautical Systems Division," 101; and Wall, 64-66.

steel plates. They believed that they could determine weapons effectiveness against tanks from this result; but their model did not account for the synergistic effect of dozens of rounds hitting a combat-loaded tank. Finally, since it was more a research organization used to big budgets and its own deadlines, Eglin seemed oblivious to how increasing weapons costs or developmental difficulties affected the overall program.<sup>17</sup>

The battle to address these problems began immediately. The June 1973 DDR&E approval for full scale ammunition provided for dual-source contracting for ammunition to lower costs, as well as analysis leading to the best armor piercing shell. GE had already contracted with Aerojet for ammunition supply, and the government added Honeywell as a second competitive source. But Aerojet wanted to remain sole source, and in early 1974 even contacted congressional allies to ensure this. In response, the A-10 SPO successfully insisted upon the dual-source policy. The gun gas problem that surfaced in February 1974 took more time to solve. The Eglin Lab wanted extensive studies to resolve the problem, However, as Colonel Kishline and others later averred, the program had neither the time, the money, and the powerful backing to do this. A-10 SPO staffers worked around--and in some accounts, ran over--Eglin to remix the propellant and create a shell that yielded no combustible gases outside the barrel but retained the required high muzzle velocity. To

<sup>&</sup>lt;sup>17</sup>The gun gas problem sources are Wall, 42-45; and author interviews with Dilger, Kishline and Oates (assistant to Dilger, also source for scorched windscreen). The sources for the Army BRL's suspicions are previously cited author interviews with Buchta (ammunition program manager at Eglin from 1972-1975), Dilger, O'Bryon; and GEN Ronald Yates, USAF (ret.), telephonic interview by author, 21 April 1997, recording and notes in author's possession (A-10 SPO Director of Development Test). Sources for Eglin's position are author interviews with Buchta, Christie, Dilger, Kishline, Oates, and Yates.

O'Bryon worked as a BRL ballistics engineer until June 1974, followed by a research fellowship at MIT until August 1975, and then was Assistant to the Director, BRL, from August 1975 through September 1976. Though he was not at BRL for the one year when many of the GAU-8A gun issues climaxed, he was there both immediately before and afterwards, and was familiar with the issues involved. His observation was that the BRL takes the worst case scenario for weapons effectiveness, and uses only one-round firings to base its assessment. It did not then have the technology to postulate the effect of several rounds hitting a tank; nor did it do realistic testing until much later.

rings with plastic ones. This not only prevented propellant gas from escaping, but also reduced barrel wear and provided a cheaper source of shell rings. Though there would be occasional problems with bad lots of ammunition in later years, the gun gas fix was tested and found sure enough that the Air Force Systems Command Headquarters declared the problem closed in November 1974.<sup>18</sup>

The SPO also strove to prove the ammunition's effectiveness against tanks. Though the government determined that depleted uranium contained the desired mass and ability to burn metal upon impact (called "pyrophoric effect") early during concept development, outside players still interfered. Back in 1971, Packard's Close Air Support Study Group insisted upon tungsten and steel rounds. The Air Force tested the various candidate rounds, and in July 1973 repeated its assertion that depleted uranium was the best for the armor piercing incendiary function. Still, the service had to show that depleted uranium would not produce harmful radioactive side effects during production, handling, and battlefield use--both Dilger and Kishline recalled several congressional inquiries on this matter. Perhaps to ensure an unbiased judgment, DoD's Joint Technical Coordinating Group handled the study, and in April 1974, reported that the material had "no significant

<sup>&</sup>lt;sup>18</sup>LTGEN Al Casey, USAF (ret.), telephonic interview by author, 17 May 1998, notes and recording in author's possession (Casey assisted Dilger with gun issues at the A-10 SPO); Buchta, interview by author; Dilger, "Tank Killer Team," 190; Edward Elko and T.R. Stuelpnagel, "The 30-mm GAU-8A Ammunition Story," <u>National Defense</u> 66 (September 1981): 51; Kishline, interview by author; COL John Lieberherr, USAF, personal interview by author, Fairfax, Va., 4 May 1998, notes in author's possession; Oates, interview by author; Robinson, "USAF Plans A-10 Deployment to Europe," <u>AW&ST</u>, 45; Suydam, "GAU the Giant Killer," <u>National Defense</u>, 133-134; Sweetman, A-10, 14; Wall, 35-45; and Watson, "Close Air Support Aircraft," 94.

The change was to use potassium nitrate in the gun propellant; the SPO borrowed this practice from the Navy and its battleship guns. Another gun firing problem was gun gas residue accumulation on the windscreen and engine blades. The solution involved including a windshield wash system and ensuring regular engine washes. Lieberherr was involved with A-10 weapons issues from 1977. He recalls an A-10 dual-engine flameout caused by secondary gun gas ignition in 1978.

Edward Elko was President of Aerojet, and praises the competitive bidding. This does not square with SPO interviewee account of Aerojet's initial sole contractor efforts. However, Elko also praises the SPO for granting to contractors the freedom to efficiently meet specifications, as well as sharing in some production facilities costs.

medical and environmental impact." The other issue with this material was ease and cost of production, something which SPO staffers' initiative solved. They discovered that Ohio-based Battelle Laboratories knew how to mass-produce depleted uranium shell cores cheaply, and was also willing to support the two ammunition manufacturers.<sup>19</sup>

In the end, the most dramatic means of proving the gun came with realistic testing. At the time, this was a novel concept, since most weapons evaluations were either pure computer studies or controlled, small-scale tests whose results were extrapolated via computer modelling to make larger conclusions. In gun tests, for example, the Army and Air Force weapons labs fired rounds singly at a piece of armor and derived conclusions about what this did to an entire tank. The labs did this due to an institutionalized faith in computer analysis and the not-unreasonable fear of runaway test costs. And though this may not have been another reason, analysis left itself open to manipulation of the premises. One can say that any test carries such pitfalls, but computer and other engineering analysis was especially vulnerable due to the lack of actual, perhaps conflicting, experience. In this case, the Army BRL wanted to downgrade the GAU-8A's effectiveness due to its potential for demeaning the importance of tanks, and it did so. As for Eglin, as well as a new Air Force test monitoring agency called the Air Force Test and Evaluation Center (known by the acronymic "AFOTEC," and the A-10 was its first aircraft project), the issue apparently threatened the validity of their own methods.<sup>20</sup>

<sup>&</sup>lt;sup>19</sup>Dilger, interview by author; Elko and Stuelpnagel, "Ammunition Story," <u>National</u> <u>Defense</u>, 51-52; Geiger, and others, 98; Charles Gilson, "Can the A-10 Thunderbolt II Survive in Europe?" <u>International Defense Review</u> (henceforth abbreviated to <u>IDR</u>) 12 (February 1979): 186 (sidebar about GAU-8A and ammunition); Kishline, interview by author; Oates, interview by author; and Wall, 49-57.

One anonymous interviewee, who was associated with gun testing in the late 1970s, opined that depleted uranium in large quantities could be a hazard. The author sides with the government study. It occurred during the 1970s, when there was great skepticism about military weapons in general and nuclear test safety in particular. The Congress had a post-Watergate, post-Vietnam Democratic majority that probably would have challenged any suspicious findings.

<sup>&</sup>lt;sup>20</sup>Author interviews with Buchta, Dilger, Christie, Kishline, Oates, and Yates. A good primary source account of the battle to make the BRL adopt realistic weapons testing

Against this resistance, and knowing that the A-10's survival possibly depended upon it, A-10 SPO staffers Kishline and Dilger set up a live fire demonstration against tanks at the Nellis Air Force Base test ranges in Nevada. It featured A-10s flying attack profiles against combat-loaded tanks---that is, normal fuel and ammunition load---using armor piercing 30 mm ammunition. The results were spectacularly successful, and Dilger, who was the actual live-fire project manager, made sure that they were filmed. The hail of shells produced in a firing burst set the tanks on fire, and in some cases, blew them up. At an autumn 1974 DSARC meeting, Kishline impressed the attendees with these films and emphatically ended any development phase questions about GAU-8A effectiveness. Autumn 1975 live firings against T-62 tanks captured by the Israelis in the October War punctuated the gun's success.<sup>21</sup>

Still, there remained the issue of per-round cost, and the SPO needed to reduce it as much as possible to relieve pressure about A-10 program cost overruns. Ensuring that there continually be two competitive contractors for ammunition allowed the service to

is COL James Burton's <u>The Pentagon Wars</u>. In his telephonic interview with the author, COL Burton said that the realistic gun tests for the GAU-8A inspired this approach to Army testing.

<sup>&</sup>lt;sup>21</sup>DDR&E, "Development Coordinating Paper, A-10 Specialized Close Air Support Aircraft, #23B," (henceforth known as DCP 23B), 1, 4 supporting documents; Dilger, "Tank Killer Team," 190-191; Elko and Stuelphagel, 52; Kaplan, "Beast of Battle," 12; and author interviews with Dilger, Kishline, O'Bryon, Oates, Stolfi, and Yates; and Wall, 66-67. The official live fire details were that A-10s made 22 passes against 15 tanks, immobilizing all 15 and destroying 8. O'Bryon intimated BRL suspicions that the Air Force put gasoline inside the turrets to create a more spectacular display. This was something that Oates, who participated in the gun tests, denied. The author sides with Oates in this case. After all, the tanks also carried diesel fuel in their fuel tanks and explosive ammunition inside their turrets, just as in real combat. One must consider the effect of 30 mm shells upon this setup. GAU-8A rounds contact the turret and either penetrate outright with pyrophoric effect or at least cause spalling effect (pushes the armor inward and causes it to liquify and separate at roughly the same velocity as the impacting round). Molten, flaming balls of the material ricochet and splatter within the turret at high rates of speed. If the material contacts explosive shells and causes them to in turn detonate, the result could be equally dramatic. There is a limit to realistic testing, of course, and no crew was aboard during the live fire. However, one can easily imagine the 30 mm rounds' effect upon them.

work the cost per round from nearly eighty dollars per round to around twenty dollars per round. When one considers that the gun fired seventy rounds in a two-second burst, and that pilots would require a great many rounds for both practice and combat, this created spectacular savings. Additionally, the A-10 SPO staff found that aluminum shell casings worked as well as steel or brass, which not only saved money but also weight. The SPO staff also suppressed various Eglin shell improvement initiatives that would have increased costs and added development time and risk. Finally, Colonel Dilger spearheaded creation of an automatic loading machine that would reduce time, complexity, and cost when conducting routine reloadings.<sup>22</sup>

Resolving gun issues was the last major hurdle before OSD and the Air Force allowed Fairchild to commence full production of operational models. Upon the DSARC's Milestone IIIB recommendation in early 1976, OSD approved a total buy of between six hundred and seven hundred aircraft (though Congress would approve spending on a year-by-year basis). This meant that the plane still had to prove itself somewhat, as the later Enforcer hearings attested. There was resistance within the service as well, as A-10 defenders allegedly spoiled an attempt to place responsibility for the program in some OSD bureaucratic backwater in 1975. This brings up the issue of the A-10 SPO staffers' efforts on behalf of their plane. In later years—especially in the 1980s when the military reform movement decried the inverse evils of increased weapons costs and allegedly decreased military quality—observers cited the A-10 and its project staffers as paragons of what common sense and initiative could do for military effectiveness. Specifically, reformist writers presented Colonel Bob Dilger as an example of a hard-charging innovator single-handedly challenging an incompetent defense management. Certainly, Dilger was aggressive and innovative; all accounts agree on that point. From his service while at the

<sup>&</sup>lt;sup>22</sup>James Coates and Michael Killian, <u>Heavy Losses: The Dangerous Decline of</u> <u>American Defense</u> (New York: Viking Press, 1985), 154-155; MAJ Michael Riley, USA, "The A-10 Thunderbolt as an Organic Army Asset" (Master's thesis, Army Command and General Staff College, 1991), 77 (praises automatic loading system as part of the plane's easy maintainability); and Wall, 17-20, 36-37, 69-70, 78-80 (Wall cites one study that pointed out that ammunition accounted for 90 percent of costs in the life of a gun system); and the following interview by author: Buchta, Casey, Dilger, Kishline, and Oates.

Pentagon, through the development stage just recounted, and onward to later actions, he substantially contributed to the A-10 gun's success. However, he was not the only man involved with some of decisive actions mentioned. The official accounts and personal interviews reveal that others, such as Al Casey, Bob Buchta, Tom Christie, John Foster, Sam Kishline, and Ron Yates played big roles in securing such things as dual-source contracting and realistic tests.<sup>23</sup>

On 30 March 1976, General Dixon presided over the Langley Air Force Base ceremony that formally welcomed the A-10 into the Air Force operational inventory. There were still obstacles to overcome, but the aircraft was the product of nearly ten years of extensive concept development work, competition, challenges, and constant paring and refining to make it meet both operational and financial demands. The issue about whether it actually met its design-to-cost goal was still open to interpretation--though even if one

<sup>&</sup>lt;sup>23</sup>Examples of the heroic Dilger accounts are Burton, <u>Pentagon Wars</u>, 24-25, 58-59 (Burton worked with Dilger on other gun projects, and was impressed with his no-nonsense, can-do style); Coates and Killian, <u>Heavy Losses</u>, 154-155; "Cost Cutter," <u>Time</u>, March 1983, 29; Frank Greve, "A Career Cut Short by a Mission Well Done," <u>San</u> <u>Jose Mercury</u> 15 November 1982, reprinted in <u>More Bucks, Less Bang</u>, ed. Rasor, 284-288; Kaplan, "Beast of Battle," 12; and Mintz, "The Maverick Missile," in <u>More Bucks, Less Bang</u>, ed. Rasor, 176.

The A-10's approval for production is from U..S. Air Force Systems Command, "AFSC History, 1 January 1976-31 December 1976," n.d., 168-169, DCP 23B, 1; and Watson, "Close Air Support Aircraft," 96-97.

In his "Maverick Missile," article, Mintz writes that, in mid-1974, people within both OSD and the Air Force attempted to stall A-10 production indefinitely. In this account, Tom Christie (then working in OSD's Programs, Analysis and Evaluation Office) learned of it and not only threatened to propose transferring the A-10 to the Army but also alerted both Deputy Defense Secretary William Clements and TAC Commander Robert Dixon, who halted the effort. On 12 March 1997, the author phoned Mintz for more details, but Mintz could not remember specific sources. In their interviews with the author, neither former TAC Commander Dixon nor former Air Force Chief of Staff Jones remembered any such action. Dixon said that Air Force generals may have opposed the A-10 (Mintz mentioned U.S. Air Forces in Europe commander, GEN John Vogt), but added that it was unwise to attempt terminating a project that the top leaders supported. Tom Christie told the author that there were two attempts within OSD and the Air Force to halt production, but that both were stopped long before they gained any momentum. He did not provide extensive details, however.

accepted the pessimistic estimates, it had not missed by much. It was now time to prove itself outside the developmental world as well.

#### The Warthog

The Air Force later christened the A-10 the Thunderbolt II, in honor of the Republic Aviation Company's rugged P-47 Thunderbolt that did such good ground support in World War II. However, both supporters and detractors among the service's pilots called the plane the "Warthog" for its ugly appearance compared to other tactical planes (it was also simply called the "Hog"). Indeed, one late-1970s commander of a new A-10 wing later recalled his wife's reaction upon first seeing the Warthog. She said that she was always confused about identifying other jets he had flown, but she would never have any problem remembering this one. Before too long, jokes about the Warthog's relative lack of speed and technological sophistication appeared. One was, "What is the greatest threat to the A-10 during low-level flight? Bird strikes from the rear." Another joke went, "Two tanks are driving down the road, and the commander of one radios the other, 'A-10s are attacking us from behind! Step on it, and we'll outrun 'em!'" And still another informed, "What is the speed indicator in an A-10? A calendar."<sup>24</sup>

<sup>&</sup>lt;sup>24</sup>Adams, interview by author (wife anecdote); Lou Drendel, A-10 Warthog in Action (Carrollton, Tex.: Squadron/Signal Publications, 1981), 3-5 (Drendel gives the official naming date as April 1978, which apparently occurred during the ceremony honoring Fairchild-Republic's production of the 100th A-10); Len Famiglietti, "A-10, Thunderbolt II, Harks Back to P-47," Air Force Times, 17 April 1978, 10; Lieberherr, interview by author; "Remarks of General Dixon at 100th A-10 Ceremony on April 3, 1978," AFHRC Holding K417.168-119 (Dixon refers to the P-47's exploits, and then refers to the A-10, "which we now call the Thunderbolt II"); Smallwood, Warthog, 16-19; Sweetman, A-10, 12, 15 (notes official name and unofficial name; cites Eglin AFB Tactical Air Warfare Center [TAWC] Major Michael G. Major with the first recorded use of "Warthog" nickname in a 1974 TAWC Review article on the plane). Drendel, Lieberherr, and Smallwood note that A-10 pilots embraced the nickname and insisted to newcomers that it be called thus. Lieberherr recalled that TAC headquarters initially banned use of the nickname (apparently due to fears about A-10 unit morale and negative public image), but Air Force aviation painter Keith Ferris' picture, "Warthog at Work," illustrated, so to speak, the ban's futility. Jokes are courtesy of author's Air Force tours as an A-10 pilot, as well as Smallwood, Warthog, 9.

The acceptance issue was an important one, for the plane had its Air Force enemies. General John Vogt, at the time commander of the U.S. Air Forces in Europe (USAFE), bluntly told people that the plane would not long survive European air combat. Nellis Air Force Base in Nevada was the service's premier fighter base, since its fighter weapons and tactics testing, Fighter Weapons School (FWS), and the newly created "Red Flag" tactical combat exercise were all there. The Nellis non-Warthog pilots' attitude toward the A-10 was and remains cool, if not downright contemptuous. Also, one aviation weekly noted that "Ninety-five percent of the pilots transitioning to the A-10 do not want to come because of the fighter pilot's traditional value on speed and looks."<sup>25</sup>

However, for the men who flew it, the plane inspired fierce loyalty. The same journal that commented upon pilots' unenthusiastic reaction to an A-10 assignment also noted their dramatic conversion after flying it. Indeed, some of the men who later

<sup>&</sup>lt;sup>25</sup>Sources for Air Force and Nellis pilot contempt for the A-10 from the time of its operational debut are COL Marvin Bass, USAF, telephonic interview by author, 7 July 1997, notes in author's possession (Bass commanded Air Warrior, the air support exercise operation at Nellis, in the early 1990s, and felt that doctrine/budget considerations drove Nellis attitudes); COL Robert Chaleff, USAF (ret.), telephonic interview by author, 28 May 1997, notes in author's possession (worked A-10 weapons and tactics test issues at Nellis for years; said that the Nellis leadership tolerated the Warthog as part of service policy, but that it was the "bottom dog of the plate"); Lieberherr, interview by author (Lieberherr, who served in the initial flight instructor cadre of A-10's Fighter weapons School, noted Nellis attitude and the fact that the A-10 became operational at the same time as more glamorous planes, such as the F-15); Lloyd (as congressman, heard informal complaints about the plane); MAJ Norman Mekkelsen, USA, "Close Air Support in Europe: Fact or Fiction?" (Research Report, Air Command and Staff College, 1980), 5-7; and Sanator (heard complaint stories while at Fairchild).

Also, MGEN James Hildreth commanded the Tactical Fighter Weapons Center (TFWC), which was the umbrella command for most of Nellis' operations, from 1977 to 1979. In his Air Force Oral History Program interview, Hasdorff, <u>Hildreth</u>, 64-66, he doubted the plane's survivability in part because of his assumption that the A-10 incorporated no survivability improvements learned from Vietnam (?).

The quote is from "First A-10 Squadron Operational Ahead of Schedule Despite Transition Difficulties," <u>AW&ST</u> 108 (6 February 1977): 208; and the Vogt sources are Mintz, "The Maverick Missile," in <u>More Bucks, Less Bang</u>, ed. Rasor, 177; and <u>Talbott</u>, 144.

commanded A-10 units during and after Desert Storm finished their pilot training in the late 1970s and made the A-10 their first choice among fighter assignment options or chose the plane as soon as an assignment came available.<sup>26</sup>

Calling themselves "Hog drivers," A-10 pilots embraced the Warthog nickname and laughed off the derision. A-10 training unit instructors teased pilots transitioning from other jets: "Don't worry, we'll let you put a sack over that mother before you get in and fly it." Addressing the Hog drivers' enthusiasm, one Air Force general asserted that pilots naturally develop a loyalty to their specific machine. This was often true, but there were other reasons for the Warthog pilots' attitudes; and though every pilot had his own motivations, one can still derive general reasons through accounts and interviews. The Hog was easy to fly, and its maneuverability not only helped during CAS but also made it a hard plane for ground gunners and fast jet fighters to successfully track. Its ruggedness generated confidence in its survivability. Its simplicity and easy maintainability meant that it flew more than other jets-something quite attractive to pilots. Simplicity generated affection in another way. To pilots turned off by new jets' emphasis upon complex combinations of autopilots, radar, inertial navigation systems, and computers, the Hog was a return to pure tactical flying. The A-10's primary weapon was not a functionally temperamental radar missile, but a simple gun whose destructive impact bred confidence in the plane (though its secondary armament, the Maverick TV missile, provided its own vexations). The challenge involved in successfully accomplishing a CAS mission motivated pilots, as they had to evade defenses, maintain formation integrity, and then find and hit

<sup>&</sup>lt;sup>26</sup>"First A-10 Squadron Operational Ahead of Schedule," <u>AW&ST</u>, 208-212; LTCOL Arthur "Cub" George, USAF, telephonic interview, 2 June 1997, recording and notes in author's possession (A-10 FWS commander in the mid 1990s); LTCOL Bruce "Spanky" Hennigar, USAF (ret.), telephonic interview, 16 May 1997, recording and notes in author's possession (Nellis squadron commander, A-10 weapons and tactics test project officer chief, and FWS instructor during the late 1980s and early 1990s); LTCOL Ron Henry, USAF, telephonic interview, 28 May 1997, notes in author's possession (A-10 National Guard squadron commander); COL Lieberherr (A-10 squadron commander and FWS deputy commander, late 1980s); LTCOL Daniel Swift, USAF, telephonic interview, 27 May 1997, recording and notes in author's possession (Desert Storm A-10 wing weapons officer and A-10 National Guard unit commander).

often fleeting targets. And just as trench-strafing pilots discovered during the first CAS missions back in World War One, helping one's own ground troops bred commitment, since it was a worthy task that yielded direct, tangible results. One Army historian noted that this was perhaps the most important part of the Air Force's A-10 purchase; the Hog created a corps of pilots whose mission outlook consisted only of successfully performing CAS. A saying at the A-10 FWS summed up the attitude: "You can shoot down every MiG the Soviets have, but if you return to base and a Soviet tank commander is eating chow in your snackbar--you've lost the war, Jack." The saying had an edge, and it revealed another source of pride. Other fighter pilots' contempt for the plane generated not a little defiant camaraderie among Hog drivers.<sup>27</sup>

Other author A-10 pilot interview sources are COL Marvin Bass; LTGEN Stephen Croker, USAF (ret.), personal interview by author, Washington, D.C., 9 May 1997, notes

<sup>&</sup>lt;sup>27</sup>"A-10: A NATO Preview," <u>NATO's 15 Nations</u> 22 (April-May 1977): 99-104 (cites pilot praise, especially from LTCOL Dale Tabor, who says that he wanted to help validate his choice of the A-10 when he participated in the A-7/A-10 flyoff); "A-10 Program Unaffected by Crash at Paris Airshow," AW&ST 106 (13 June 1977): 36 (describes difficulty of tracking A-10s with anti-aircraft weapons); "A-10 Reliability Expands Crew Training," AW&ST 108 (6 February 1978): 229; GEN Wilbur Creech, USAF, "USAF Fighter Weapons Instructor Course, A-10," TAC Syllabus #A1000ID0PN (Langley AFB, Va.: Headquarters TAC, 1983), 3-7 and 3-8, 5-23 through 5-26, AFHRC Holding K-WG-57-HI (the A-10 FWS contained ten hours of academics on Army operations and four joint air attack missions with Army helicopters); Drendel, A-10 Warthog in Action, 3; "First A-10 Squadron Operational Ahead of Schedule," AW&ST, 208-212 (also describes good flying rate due to high reliability); MAJ John Gulick, USAF, "The A-10 Does It Better," Air Force Magazine (henceforth known as AFM) 59 (July 1976): 75-79 (interview of A-10 test team pilots, who tout their plane's lethality, maneuverability, survivability, and challenging mission); John Halbert, Hugh Lucas, and Ron Sherman, "The Warthog," NATO's Fifteen Nations 25 (June-July 1980): 72; LTCOL Steve Ladd, USAF, A-10 Division Commander, FWS, "The Pulse, the Word, and the Difference: the A-10 School," Fighter Weapons Review (henceforth known as FWR) (Fall 1984): 20 (FWS saying); William Schlitz, "Lethal Against Armor: The Joint Air Attack Team," AFM 63 (September 1980): 48-49 (pilots boast of simplicity and survivability; they also like using basic pilot skills: "they can fly, instead of 'zipping along above the clouds punching black boxes," p. 48); Smallwood, Warthog, 1-9, 16-19 ("sack" quote, 17); LTCOL Dale Tabor, USAF, "An Open Letter to A-10 Pilots," TAC ATTACK 16 (August 1976): 5-7; and BGEN Rudolph Wacker, USAF, "A-10 Close Air Support Operations in Europe," AFM 62 (August 1979): 76-77; and Winton, (the "Army historian" cited herein).

Still, even A-10 pilots wanted improvements for their plane. The final DCP, as well as the A-10 test team, identified a number of weaknesses: lack of chaff/flare dispenser, inertial navigation system (INS), stability augmentation system, cockpit heads-up display, and Maverick TV missile cockpit display. In late summer 1976, GAO investigators gathered from the testers one other major complaint-the plane's lack of available engine thrust. This issue would remain unresolved, however, because such a change was far too ambitious and costly at this point. It was also the price paid for a wing designed for short-field capability, high weapons carriage, and long loiter time operations. The extra thickness required for success in these flight regimes created too much drag even for a powerful engine to overcome (and overpowering the wing's drag also required unacceptably high fuel consumption). As for the other items, the service's design-to-cost philosophy meant no purchase until the plane became operational and the pilots proved the need. As TAC commander Dixon later said, the main objective was to get the plane on the ramp and then purchase the nice to haves. Except for the INS, the service fixed these other items within the A-10's first five operational years. Given the urgency created by increased air defense lethality, the chaff/flare modification occurred within the first two years. The INS modification required A-10 European deployments to fully prove its need, and the service did not make the change until 1983. The pilots did not want a high-technology avionic platform like the A-7 or F-111, but they came to believe that an INS enhanced CAS mission success. It reduced pilot workload in navigation, area orientation, and target acquisition-especially during low-level attacks. This was especially

in author's possession (former 8th Air Force commander who only flew the A-10 a few times, but liked it; likened the Hog to a crop duster with a big gun); COL Charles Fox. USAF, personal interview, 10 April 1997, MAFB, notes and partial recording in author's possession (chief of A-10 wing operations center during Desert Storm); COL Ed Houle, USAF (ret.), telephonic interview, 6 June 1997, notes and recording in author's possession (member of one of the first A-10 test squadron and FWC instructor); COL David "Bubba" Jenny, USAF, telephonic interview by author, 28 June 1997, notes in author's possession; MAJ Mark Koechle, USAF, letter response to author's written questions, 21 June 1997, letter in author's possession (on wing weapons staff during Desert Storm); and LTCOL Seth G. "Growth" Wilson, USAFR, telephonic interview, 20 May 1997, notes in author's possession (squadron operations officer in Desert Storm).

so in Europe, where defenses were supposed to dictate such an approach. As the Hog pilots observed, Europe's often flat, nondescript terrain and poor visibility required much greater pilot attention to navigation chores than that needed on American Southwest Desert weapons ranges where one had large terrain landmarks and unlimited visibility. Further, the battlefield's ever-changing nature meant that one often could not precisely plan for and study CAS navigation details. Once at the target, hard maneuvering to avoid defenses required maximum situational and geographic awareness. One could do the mission without the high technology--after all, pilots did it all the time at higher altitudes in World War II--but the INS made the hard low-level job easier.<sup>28</sup>

<sup>&</sup>lt;sup>28</sup>"A-10: A NATO Preview," NATO's Fifteen Nations, 90 (this April-May 1977 issue reports that the HUD and Maverick capabilities are in place); GEN Adams, interview by author (notes performance penalties of wing and engine); "Air Force Studies Fighter Pilot Workload," Electronic Warfare/Defense Electronics 10 (April 1978): 55-58 (discusses addition of laser spot tracker to alleviate difficulties finding CAS targets; also notes difficulty of low-level CAS mission); "Attack and Observation Aircraft," AFM 61 (May 1978): 117 (lists HUD and chaff/flare as modifications); "Attack and Observation Aircraft," AFM 67 (May 1984): 160-161 (announces INS modification); David Brown, "A-10 Pilots Stress Navaid Requirement," AW&ST 107 (19 September 1977): 52-53 (instructor pilots from A-10 training unit conducted test deployment to Europe and worked well, but wanted INS to ease workload; HUD fix underway); Carleton, "The A-10 and Design-to-Cost," 5-11, 22-29; "Center Seeks New Combat Techniques," AW&ST 108 (6 February 1978): 81-82 (discusses push for INS); DCP 23B, 13-17; Crawford, "Low Level Attacks of Armored Targets," 11-12 (discusses low level navigation difficulties); "First A-10 Squadron Operational Ahead of Schedule," AW&ST, (Maverick being used; need for INS and stability augmentation system; A-10 to get better HUD and radar warning receiver; fixes for chaff/flare dispensers underway); Halbert, Lucas, and Sherman, "The Warthog," NATO's Fifteen Nations, 70-73; MAJ Tony Helbling, USAF, "Do It in the Spinich," Aerospace Safety (April 1978): 1-3 (notes high workload associated with low altitude tactics required against modern air defenses); Oates, interview by author (recalls that Whitley's complaints about the engines earned a warning from superiors); Robinson "USAF Plans A-10 Deployment to Europe," AW&ST, 47; Summary of AFTEC internal letter, 30 September 1976, AFHRC, copy in author's possession (contains outline of GAO questions and A-10 test pilot answers); Will Schaeffer, "A-7 Strikefighter--Rebirth of the Corsair II," Asian Defense Journal (December 1986): 39 (speed problems due to wing design and weight of reinforced airframe); Sweetman, 42-44, 56-57; COL Alton Whitley, USAF (ret.), telephonic interview by author, 2 July 1997, notes and recording in author's possession (Whitley was on the test team and remembered the GAO investigation; he said that he did not mind official heat for pointing out deficiencies if this improved the

## Initial Demonstrations of the A-10's Operational Capability

TAC commander Dixon later said that, regardless of what various Air Force people thought of the plane, it was up to the service to make it perform as well as possible. This took some time, since more planes had to be built and pilots trained to fly them. Further, the pilots then had to gain experience and develop tactics. Many in the initial test and instructor cadre either had no CAS experience or had experienced CAS flying fast jets in Vietnam's relatively low-threat combat environment. They had to develop procedures for using the A-10's unique weapons against the kind of defensive situations the Israelis faced in the October War. Thus, active participation in exercises did not really commence until 1977. Even then there were only small test units at Edwards Air Force Base (AFB) and Nellis AFB, a pilot training wing at Davis-Monthan AFB, Arizona, and an operational wing still forming at Myrtle Beach AFB, South Carolina.<sup>29</sup>

Nonetheless, the A-10 community pushed to validate its new tactics as soon as possible, and in spring 1977 the training wing, the 355th Tactical Fighter Training Wing (TFTW), participated in a Red Flag exercise. Conducted at Nellis' extensive desert weapons ranges, Red Flag was an ongoing series of exercises representing General Dixon's

<sup>29</sup>Drendel, <u>A-10 Warthog in Action</u>, 4-6; "First A-10 Squadron Operational Ahead of Schedule," <u>AW&ST</u>, 208-209; Gilson, "Can the A-10 Thunderbolt Survive in Europe?" <u>IDR</u>, 189 (notes challenges to pilot adjustment); and GEN Ronald Yates, USAF, interview by author (recalls the test pilots' varied backgrounds, and the fact that the plane presented new problems).

plane); and GEN Yates, interview by author (notes performance penalties of wing).

An inertial navigation system uses gyros and a computer to track and display an airplane's position, as well as plot and display courses to programmed destinations. A head-up-display is not only a gunsight, but also shows aircraft airspeed and altitude. The more advanced HUDs use INS information to present such things as an aircraft flight path symbol, destination marking symbol, and INS-assisted weapons aimpoints. Some proof of the Hog drivers' emphasis upon pilot and not computer skills is in MAJ Rod Schraeder, USAF, "Augustine's Law XXIII: Hardware Works Best When It Matters Least," Fighter Weapons Review (Fall 1987): 29-32. Schraeder was an A-10 FWS graduate and wing weapons officer. Writing a few years after A-10s received INS devices, he warns about the pitfalls of over-reliance upon such equipment, and recommends that Hog drivers base their skills upon flying fundamentals. Interestingly, Schraeder flew F-117s in Desert Storm and served as one of the Stealth wing's weapons officers.

effort to ensure that his fighter pilots experienced the most realistic simulation of modern air combat. This spring 1977 Red Flag combined its own operations with those of Army maneuvers at nearby Fort Irwin, California, and it was here that A-10 pilots first demonstrated the tactics they believed would ensure A-10 effectiveness and survival. Since they expected to remain on their own side of the lines until just before attacking troops at or just behind the front lines, they flew very low and made every use of the mountainous terrain to hide from antiaircraft radar. They liberally used their gun and Maverick missiles, both of which allowed them to stand off from the target and still hit it. When operating within range of known radar gun emplacements, they jinked hard and spoiled the gunners' tracking solutions. Finally, they could easily turn to face any jet fighter that attacked them, thus negating the fighters' speed advantage. Finally, the plane proved its easy maintainability as the 355th conducted its operations from a desert dry lake and exceeded all maintenance reliability expectations.<sup>30</sup>

Though flown in the Nevada desert, these tactics had the tough European combat environment in mind; this was where the 355th sent its pilots in June 1977. (There was also a tour of American bases in Asia, but Europe was the arena that dominated Air Force and defense media attention during this time.) The trip had a number of objectives. Not only would the pilots learn about using the plane in a different environment, but they would also demonstrate to the Europeans the plane's usefulness. Fairchild also wanted to advertise the A-10 to potential European buyers. After all, General Dynamics had recently completed a huge sale of its F-16 to several NATO countries.<sup>31</sup>

Europe was a hard case, in more ways than one. Also in June, Fairchild leased an A-10 back from the Air Force to use for demonstration flights at the internationally

<sup>&</sup>lt;sup>30</sup>Drendel, 5-6; Donald Fink, "A-10 Survivability in Attack Role Shown During Simulated Combat," <u>AW&ST</u> 106 (20 June 1977): 88-93; Donald Fink, "Joint Combat Exercise Tests Tactics," <u>AW&ST</u> 106 (23 May 1977): 24-25; and COL Houle, interview by author. (Houle flew in this exercise.)

<sup>&</sup>lt;sup>31</sup>Drendel, 4-5; and Ben Kocivar and John Rhea, "A-10 Ready for Attack," <u>Flight</u> <u>International</u> 112 (22 October 1977): 1191. For the big F-16 sale in Europe, see Dörfer's <u>Arms Deal</u>, which is about this event.
prestigious Paris Air Show. While watching a company promotional film featuring A-10s demolishing tanks at the Nellis weapons range, one German Luftwaffe general scoffed:

That's all very well for the Nevada desert; for the clear weather conditions predominating in the Middle East and South-East Asia! [?] But what of Central Europe? If the Russians come, they are unlikely to court suicide by choosing a bright summer's day with visibility to the horizon; they will come at night, exploiting the murkiest weather that their forecasters can predict, and they will travel beneath a sophisticated air defense umbrella. What use will your fair-weather A-10 be then?

The general's comments reflected many NATO officers' attitudes; throughout the late 1970s, European defense journals and officers questioned the Hog's ability to handle Continental weather and defenses. And ominously for Fairchild, the Europeans did not care for its commitment to only one mission. With their limited defense budgets and relatively small forces, they wanted multirole fighters. Indeed, some questioned how the United States could commit some of its already outnumbered Europe defense resources to a mission that they believed yielded too little result for too much cost. Meanwhile, Fairchild-Republic probably did not change many minds at the airshow when its test pilot crashed his A-10 during a flight demonstration and was killed.<sup>32</sup>

<sup>&</sup>lt;sup>32</sup>"A-10 Program Unaffected by Crash at Paris Air Show," AW&ST, 36; "A-10 Testing to Continue in Europe," Air Force Times, 20 June 1977, 43; GEN Adams, interview by author; Drendel, 5-6; Futrell, Ideas, vol. II, 498-499; Gilson, "Can the A-10 Thunderbolt II Survive in Europe?" IDR, 184-189 (mentions doubts, and answers that the plane can flourish in Europe; it is an improvement over other Air Force CAS machines, and its simplicity and easy maintainability means that more planes could operate from austere fields to help stop the Soviet tank onslaught); Gunston, Attack Aircraft, 270-271 (Gunston was a former RAF fighter pilot and current European defense journal writer, and the summary of his A-10 chapter expresses many of the Europeans' concerns); Halbert, Lucas, and Sherman, "The Warthog," NATO's Fifteen Nations, 74-75 (talks about foreign military sales [FMS] difficulties of A-10); David Harvey, "Aircraft for Export: Cutting Off the US Nose?" Defense & Foreign Affairs 8 (April 1980): 45-46 (further discussion of A-10's FMS difficulties); Group Captain Ian Madelin, RAF, "The Emperor's Close Air Support," Air University Review (henceforth known as AUR) 31 (November-December 1979): 82-86 (RAF exchange officer serving at Air University questions Air Force dedication to CAS because he feels that more lucrative Soviet targets will exist behind the lines); GEN Donn Starry, USA, Commander TRADOC, to ALFA, "Close Air Support," 8 August 1977, GEN Donn Starry Papers, Box 3C, August 1977, Item 13, AMHI, Carlisle Barracks; GEN Donn Starry, USA, Commander TRADOC, to Steven Canby, defense

The European arguments were the same as those raised by many American airmen through the years. The Europeans were unaware of the plane's excellent survivability features, maneuverability, and weapons effectiveness. Most of all, their own qualms about the A-10 and night/all-weather (N/AW) CAS raised again the issue of just how this type of air support was supposed to be done--especially in Europe where CAS missions were expected be flown at very low levels against heavy Soviet air defenses. As mentioned in an earlier chapter, the technology required to identify enemy and friendly troops did not exist. Historically, even the pilots' eyes had trouble discerning the reported CAS target. The workload required to fly completely by reference to instruments, identify and employ weapons against a fleeting target, and evade enemy air defenses, was simply overwhelming. Troops on the ground probably could not see their opponents in the weather that the night/all-weather CAS plane advocates envisioned. The A-10 actually represented the best answer to an intractable problem for fixed-wing CAS. Its slow speed and maneuverability allowed it to work in marginal weather, just as the A-7 flyoff had demonstrated. Finally, the Soviets might launch an attack on a stormy night, but this condition would not obtain for long.33

The Hog pilots in Europe wanted to show their plane's poor weather strengths. Participating in NATO's annual Reforger exercise, which tested American-based forces' ability to deploy and then help other NATO units repel a Soviet assault, the Hog impressed

writer, reply letter, GEN Donn Starry Papers, Box 3C, August 1977, Item 23, AMHI Carlisle Barracks, Pa. (in both letters, Starry notes European resistance to CAS); GEN Johannes Steinhof, Luftwaffe, cited in "The Fairchild Can-Opener: Shturmovik of the Eighties?" <u>Air International</u> 16 (June 1979): 267 (quote; Steinhof was a renowned World War II Luftwaffe fighter ace who also flourished in the postwar Luftwaffe), 267-287 (the article discusses the A-10's struggle against the skeptics); and Sweetman, <u>A-10</u>, 46-48, 52-53.

Fairchild had leased back an A-10 from the Air Force the previous year, to take to England's Farnborough Air Show. The Farnborough and Paris shows occur on alternating years, and are Europe's biggest airshows.

<sup>&</sup>lt;sup>33</sup>One previously cited RAND study during this time brought out the difficulties of night/all weather air support; see H.W. Wessely, "Limiting Factors in Tactical Target Acquisition."

NATO troops who saw it fly. The Hog drivers demonstrated their plane's ability to operate in marginal weather, as they flew under overcast ceilings as low as eight-hundred feet and visibilities as poor as one and a quarter miles (normal visual flight rules minimums are one thousand feet and three miles). Still, they repeated their desire for an INS to back up their navigation work. They were realistic about the A-10's projected fortunes should war come; they would have to use good tactics and exploit the Hog's strengths. Apparently, they were flying well enough in the new environment, because one defense journal article covering the deployment observed that the plane was hard for gunners to track. However, some U.S. Army helicopter pilots expressed skepticism about the Hog's worth. They believed that since they were *Army* pilots and since their aircraft could hover, they would provide more dedicated air support in even poorer weather.<sup>34</sup>

# The A-10 and the Army

Regardless of what the Army helicopter pilots in Germany thought, the Army leadership still liked the A-10 because as Army historian Harold Winton observed, its CAS-dedicated design made it the Air Force's physical bona fide of its commitment to supporting the Army. In the late 1970s, both the Air Force and the Army believed that air support was vitally important. During this time, officers in these two services and military leaders in other NATO countries questioned the West's ability to counter the growing Soviet conventional military threat in Europe. A prime example was the 1978 bestseller by British Army General Sir John Hackett and others, The Third World War: August 1985. Hackett and his team envisioned a fight in Germany between NATO and the Warsaw Pact which produced a near-run Western victory primarily due to military improvements accomplished between the late 1970s and 1985. Air Force and Army leader

<sup>&</sup>lt;sup>34</sup>"6 A-10 'Tank Killers' Win NATO Acclaim in Europe," <u>Air Force Times</u>, 3 October 1977, 38; "A-10, A NATO Preview," <u>NATO's Fifteen Nations</u> 99-105; "A-10 Program Unaffected by Crash," <u>AW&ST</u>, 36 (observation about tracking difficulties); "A-10 at Exercise Reforger," <u>Flight International</u> 112 (22 October 1977): 1193-1194 ("Reforger" stood for "Return of Forces to Germany"); Brown, "Pilots Stress Navaid Requirement," <u>AW&ST</u>, 52-53; Drendel, 5; and Ben Kocivar and John Rhea, and Winton, 105.

pronouncements during this time repeatedly stressed NATO's quantitative inferiority, especially in tanks, and demanded that they be allowed to develop both the A-10 and attack helicopters. Indeed, the anxiety over stopping a Soviet tank assault raised CAS to a higher level of importance. A cartoon of the time revealed this heightened concern as it showed two Soviet Army generals reviewing their tanks' victory parade in Paris, with one asking the other: "By the way, who did win the air superiority battle in the end?" The Air Force itself produced a study showing that the A-10 would be a critical item in stopping the projected invasion.<sup>35</sup>

<sup>&</sup>lt;sup>35</sup>A-10: A NATO Preview," NATO's Fifteen Nations, 110 (cites Air Force Chief of Staff David Jones' contention that the A-10 is vital to stopping Soviet attack); MGEN James Currie, USAF, Director of Programs, Deputy Chief of Staff, Programs and Resources, statement before House Budget Committee, 28 June 1977, reprinted as "Tactical Air Programs," Supplement to the Air Force Policy Letter for Commanders 9-1977 (Washington: SAF-OII, September 1977): 24 (page number from reprint); Davis, 31 Initiatives, 27-30; GEN Robert Dixon, USAF, draft of speech before Langley AFB Officers' Wives Club, 14 October 1975, AFHRC Holding K417, 168-96; GEN Dixon, 100th A-10 Ceremony Speech, K417.168-119; GEN William Evans, USAF, "Thinking 'We," EurArmy (May 1978), reprinted in Supplement to the Air Force Policy Letter for Commanders 8-1978 (Washington: SAF-OII, August 1978): 9-11 (page numbers from reprint); "The Fairchild Can-Opener," Air International, 267; Futrell. Ideas. vol. II, 548; Gilson, "Can the A-10 Thunderbolt II Survive in Europe?" IDR, 189 (concludes that A-10 must survive, in order to counter the Soviets' tank hordes); GEN Sir John Hackett, British Army, and others, The Third World War: A Future History (New York: MacMillan Publishing, 1978), passim; GEN Sir John Hackett, British Army, The Third World War: The Untold Story (Toronto, Canada: Bantam Books, 1982), xiii-xv (recounts his thinking behind writing the best seller); Isby testimony in Congress, House, Close Air Support, 101st Cong., 19 September 1990, 16 (cartoon quote and Air Force study); Mekkelson, "Close Air Support in Europe," 1-2 (cites his own experience with European military exercises as proof of CAS requirement); COL Craig Powell, USAF (ret.), "The A-10," Army (March 1976): 43 (describes need for A-10 to help against tanks); Schemmer, "Tactical Air Command: Getting Ready for Blitzkrieg War," Armed Forces Journal 114 (March 1977): 18-19; GEN Starry letter to ALFA; GEN Starry letter to Canby (in both letters, Starry insists upon CAS in spite of European skepticism because it is so necessary); "Where USAF's A-10's Fit in NATO's Defense," Armed Forces Journal International, 116 (June 1979): 18 (cites Defense Secretary Harold Brown's belief in the A-10's usefulness in Europe-the same Brown who was involved in the A-X purchase decision); Worden, Rise of the Fighter Generals, 222; and Winton, "Partnership and Tension," Parameters, 103-106 (relates joint Air Force-Army efforts of the late 1970s, and is the "Army historian" cited above).

The shared anxiety bred greater overall cooperation. A 1975 House directive to determine how the A-10 and attack helicopters duplicated missions produced no interservice bickering; instead, it generated a formal Air Force-Army agreement that the CAS plane and armed helicopter were complementary weapons systems. Repeating assertions made earlier by the 1971 Packard Committee, the agreement observed that the helicopter provided limited range and firepower in support of its parent Army unit and that Air Force planes--including the A-10--provided wider-ranging heavy firepower in support of theater objectives. Air Force TAC commander Dixon and Army TRADOC commander DePuy appeared together at classified 1976 hearings before both the House and Senate Armed Services Committees, and demonstrated their unity in the face of some occasionally provocative questions. When Representative Jim Lloyd, of Enforcer fame, and other congressmen asked about the survivability and effectiveness of the A-10 and the Army's Cheyenne successor, the Advanced Attack Helicopter, the generals did not argue about which was best. Instead, they touted their weapons' respective merits and emphasized joint service efforts, such as the ALFA staff. In the Senate Hearings, Barry Goldwater probed the generals' feelings about two different types of air support aircraft to see if any of the previous interservice bickering still existed. Dixon and DePuy assured him there was none; the two aircraft complemented each other. Dixon observed, "I think that we have grown up. I think we understand each other. I think the overwhelming size of what we have to do takes first priority with us." Though there were occasional problems and suspicions involved with precisely coordinating the two services' battlefield operations, the spirit of cooperation continued with Dixon's and DePuy's respective successors, Generals Wilbur Creech and Donn Starry.<sup>36</sup>

The subtitle for Hackett's best seller was also known as <u>August 1985</u>. He mentions A-10s twice in the book, noting that they flourished in the CAS role. Chapter 28 (349-358) summarizes his and other NATO defense officials' fears that, as of 1977, Europe could not survive a conventional Warsaw Pact assault without major upgrades.

<sup>&</sup>lt;sup>36</sup>The two hearings are courtesy of declassified transcripts at the AFHRC, Maxwell AFB, AL. They are "Tactical Airpower Subcommittee of SASC [Senate Armed Services Committee], March 1976," referring to Military Procurements, Fiscal Year 1977, hearings

The A-10 embodied joint service ideals, and further operations in the 1978 and 1979 timeframe enhanced its value in this regard. In the midst of familiarizing themselves with the Hog, A-10 units flew with Army Cobra attack helicopters during summer 1977 exercises at Fort Benning, Georgia. They discovered that if they coordinated their attacks against simulated air defenses, their kill claims rose while their own postulated losses decreased. The result rated a brief mention by a couple of defense journals as well as

Other sources for interservice cooperation on air support are "AF, Army Agree on Role of Copters," Air Force Times, 17 September 1975, 4; F. Clifton Berry, Jr., "TAC and TRADOC Talk a Lot, But Do They Communicate?" AFJI 117 (September 1979): 27-36 (interviews with GENs Starry and Creech about interservice dialogue); Cleary, Dixon, 287-300 (297-298 feature his specific recollection of his and DePuy's appearance before Congress; Dixon felt that Congress wanted to start an argument about the A-10 and attack helicopters); MGEN Currie, "Tactical Air Programs," 24; GEN Evans, "Thinking "We," 9-11; "The Journal Interviews ... BG Sidney L. Davis," Field Artillery Journal 43 (September-October 1975): 11-13 (Davis, the TAC Assistant Deputy Chief of Staff/Operations for Control and Support, mentions specific artillery-air cooperation initiatives; the Israelis' October War tactic of using artillery to suppress anti-aircraft weapons for CAS planes is one); MAJ Jimmie Quinn, USA, "Deadly as a Praying Mantis," Armor 86 (July-August 1977): 13-15 (in this article introducing the A-10, Army officer Quinn sees it as worthy member of the Air Force-Army battlefield team); "Remarks of General Dixon at 100th A-10 Ceremony," AFHRC Holding K417.168-119 (GEN Starry also attended); GEN Starry letters to ALFA and Canby (in both. Starry stresses importance of CAS in Europe); U.S. Army/U.S. Air Force Understanding of Relationship of Helicopters and Fixed-Wing Aircraft in Close Air Support, 16 September 1975, reprinted in Wolf, Basic Documents, 401-405 (also contains Wolf's background description as well as a joint letter from the Air Force and Army Chiefs of Staff to Congressman Melvin Price explaining the agreement); and Winton, 103-106.

In her TRADOC Historical Monograph Series work, <u>The Origins and</u> <u>Development of the National Training Center, 1976-1984</u> (Fort Monroe, Va.: Office of the Command Historian, TRADOC, 1992), 30-39, Anne Chapman discusses efforts to incorporate air support into the Army's realistic warfare training exercises at Fort Irwin, CA. The period that she addresses featured interservice disagreements over such things as weapons "hit" determination, when and how many planes would participate, Army unit training objectives, etc. Still, the Air Force instituted Air Warrior, its National Training Center air support operation, in an effort to improve involvement. Likewise, the Army remained enthusiastic about, and encouraged, Air Force participation.

date 17 March 1976, AFHRC Holding K417.168-122 (Dixon quote, 5640); and "CAS Panel, Investigations Subcommittee, HASC [House Armed Services Committee], September 1976, no other information, AFHRC Holding K417.168-123.

increased attention from both services' leadership. One of the journals observed that this tactic could answer "a pressing need to demonstrate to a skeptical Congress that the armed forces need a variety of attack aircraft."<sup>37</sup>

The ensuing exercise, called JAWS (Joint Attack Weapons Systems), was conducted at the Army's test range at Fort Hunter-Liggett, California, and it further verified the tactic. The exercise was as "free-play" as the two services could engineer. The overall battle scheme matched an October War/Warsaw Pact invasion scenario, in which Cobra attack helicopters and A-10s helped stop a massed armored attack protected by air defense weapons. The Army used equipment simulating the latest Soviet tactical air defenses, and the Air Force also supplied fighters to oppose friendly CAS efforts. The tactic used the Cobra formation leader as a "Battle Captain," who roved about the area coordinating ground, helicopter, and A-10 firepower against enemy forces. Flying very low, maneuvering hard, and using Hunter-Liggett's rolling terrain to their advantage, the Cobras and A-10s individually did well in evading defenses while striking their targets. But their coordinated action massed firepower against critical areas, deceived and surprised enemy air defenders, and also allowed each element to cover the other during its attack. The most glaring result came in the exercise judges' assessment of weapons effects. Coordinated attacks improved "kill ratios"—the grim proportion of air losses and enemy losses—by

<sup>&</sup>lt;sup>37</sup>"A-10/AAH Together Pack More Punch than Separately, TAC/TRADOC Find," <u>AFJI</u> 114 (June 1977): 18; BGEN Bahnsen, interview by author (Bahnsen told the author that DePuy wanted him to help develop joint Cobra/A-10 tactics, which he first attempted at the Fort Benning exercise); BGEN John Bahnsen, USA (ret.), "A New Army Air Corps or a Full Combat Arms Team Member?" 123 <u>AFJI</u> (October 1986): 70 (excellent discussion of transition from Air Force-Army friction over advanced attack helicopter, which led to A-10, to threat-induced cooperation in the form of joint tactics); F. Clifton Berry, Jr., "JAWS Chew Armor in Different Ways," <u>AFJI</u> 14 (January 1978): 32 (Berry boasts that <u>AFJI</u> "exclusively" reported the tactic's development in the June 1977 article); Kocivar and Rhea, "A-10 Ready for Attack," 1193 (quote; this article did not focus as intently upon the Benning exercise, but it did mention it, and made an astute observation about its importance); and MAJ Charles Ray, USA, "JAAT," [Joint Air Attack Team] <u>U.S. Army Aviation Digest</u> (henceforth known as <u>USAAD</u>) 25 (January 1979): 42, 44-47 (describes initial joint tactics efforts as well as Army aviator interest).

"multiples of three, four, or more." Enthusiastic leaders in both services sanctioned even more exercises.<sup>38</sup>

They had a good opportunity with an operation which had congressional and OSD interest, the Tactical Aircraft Effectiveness and Survivability in Close Air Support Anti-Armor Operations Joint Test and Evaluation (TASVAL). The test partially answered requests made for realistic CAS testing during the early 1970s CAS debates. In this case, the Under Secretary for Defense Research and Engineering (USDRE) ordered that an evaluation be conducted to resolve continued "uncertainties" surrounding CAS aircraft effectiveness and survivability. TASVAL also was OSD and the services' response to congressional skepticism about tactical air support in general and attack aircraft in particular. The tactical concerns existed since the Yom Kippur War, while the specific aircraft criticisms stemmed from continued political parsimony over defense budgets. The test was underway for only three months in June 1979 when GAO completed a classified report criticizing both Army and Air Force aircraft for their European combat environment weaknesses. It claimed that the Cobra and its Advanced Attack Helicopter successor, now identified as Hughes Aircraft Company's AH-64 Apache, could not survive against modern defenses. As for the A-10, GAO continued the quest for the mythical night/all-weather (N/AW) CAS plane by criticizing the Hog's lack of the appropriate equipment. The report recommended hearings to determine the A-10's adaptability for night/all weather

<sup>&</sup>lt;sup>38</sup>Author interviews with BGEN Bahnsen and COLs Lieberherr and Whitley (Bahnsen directed the Army side of JAWS, and Lieberherr and Whitley flew A-10s in it); Konrad Alder, "Airborne Anti-Tank Warfare, Part I," <u>Armada International</u> 4 (July-August 1980): 42-44; MAJ Joe Beach, USA, "JAWS," <u>USAAD</u> 24 (September 1978): 44-47; Berry, "JAWS," <u>AFJI</u>, 32-34 (kill ratios quote, 32); Drendel, 36-38; Gilson, "Can the A-10 Survive," 187-188; CAPT John Lieberherr, USAF, "JAAT," <u>USAAD</u> 25 (January 1979): 42-43 (article paired with MAJ Ray's piece; describes ensuing JAWS exercises); LTCOL Lauren Mullendore, USA (Defense analytical paper, U.S. Air Force Air War College, 19189), 3-4; and Sweetman, 62-63.

operations, and tests of attack helicopters' ability to face defenses. If these aircraft could not adapt, GAO recommended cancelling their funding.<sup>39</sup>

TASVAL's objectives and scope were ambitious. First, the test aimed to determine kill ratios versus various air defense combinations. It would also evaluate the worth of combined tactics involving Cobras and A-10s, and evaluate weather effects upon operations (the latter was nearly impossible, given the test location's mostly fair weather). These goals seemed benign enough, but more ominous, given OSD and congressional budget attention, was that TASVAL had to determine which tactics, weapons, and *aircraft*—or combinations thereof—generated the best kill ratios. As with JAWS, the services conducted TASVAL in the rolling terrain of the Fort Hunter-Liggett exercise area. TASVAL's scale was impressive. Conducted from April through September 1979, it included two armored battalions opposing one another, with the "enemy" battalion accompanied by a full complement of simulated Soviet tactical air defense threats. These matched the threats that the A-10's go-ahead DCP predicted that it would face—not only the SA-6s, SA-7s, and ZSU-23s of Yom Kippur War fame, but also the new SA-8 short-range, radar-guided missile. As for the TASVAL aircraft, there was a Nellis Air Force Base detachment of eight A-10s, an Army helicopter regiment, and some FAC

<sup>&</sup>lt;sup>39</sup>Bahnsen, "A New Army Air Corps?" 70 (writes that JAAT also helped save the future of the advanced attack helicopter, the Apache); BGEN Jerry Max Bunyard, USA, "Tomorrow's War Today," AFM 63 (October 1980): 64; LTCOL Hugh Dayton, USAF, "57 TTW [Tactical Training Wing] TASVAL Detachment After Action Report," October 1979, Air University Library Holding Number M-41737-597-U, 1-2, 1-3 (Dayton quotes a USDRE Memorandum which mentions that previous tests yielded conflicting results, and therefore wanted a definitive evaluation; quote, 1-1); GAO, Aerial Fire Support Weapons; How Useful Would They Be In a European Conflict? PSAD-79-65, 11 June 1979, i-iv (this is an unclassified digest of the report); Richard Hartman, "Airborne Anti-Tank Capabilities Scrutinized, Part I," Defense Electronics 11 (November 1979): 53-54; LTCOL Lowell LaRue, USA, "TASVAL," Air Defense (January-March 1980): 26; and LuAnne Levens and Benjamin Schemmer, "Loyalty Down Is as Important as Loyalty Up," AFJI 116 (February 1979): 28 (interview with Air Force Chief of Staff, GEN Lew Allen, which mentions the GAO report in passing); and Riley, "Organic Asset," 14-15 (writes that congressional pressure drove the test, but sees it only concerning the A-10; Bahnsen and the other sources make clear that the threat was to both helicopter and A-10).

planes. TASVAL's most significant aspect involved the tracking instrumentation used to assess results; for its size, it was the most heavily monitored test yet seen. Laser tracking recorded, and computers assessed, all of the players' shots.<sup>40</sup>

For six months, A-10s flew nearly five hundred TASVAL test missions supporting friendly troops against various types of armored assaults. As planned, the air attack scenarios featured A-10s and helicopters attacking separately, and then together. The kill ratios were better than expected for the separate attacks, but the combined attacks-now called JAAT, for Joint Air Attack Team (or Tactics, depending on the source)-notably improved the ratio. This was a good thing for both services, because the participants later observed that, at least initially, TASVAL had a competitive flyoff air. The A-10 pilots did not know the precise reasons for TASVAL, but they understood that there were serious consequences for not doing well. As such, they worked very hard to prove their plane, and the defenses that they faced ensured maximum effort. Randomly varied approaches to the target were not a tactically desirable action but a requirement, and actual wings-level firing passes had to be five seconds or less. To help minimize dawdling in the target areas looking for targets, the Hog drivers strove for good target orientation, and often made a guick reconnaissance pass before commencing attacks. Indeed, they looked for moving armored vehicles, and if they could see nothing distinct, they exited quickly. Additionally, their formations featured one "shooter" pilot who primarily attacked the armored vehicles

<sup>&</sup>lt;sup>40</sup>Bunyard, "Tomorrow's War," <u>AFM</u>, 64-66; Dayton, "57 TTW TASVAL," 1-1 through 4-4; DCP 23B, 4-8; "Eastern Bloc Augments Attack Force," <u>AW&ST</u> 108 (6 February 1978): 57-61; Richard Hartman, "Airborne Anti-Tank Capabilities Scrutinized, Part I," 53-62; Richard Hartman, "Airborne Anti-Tank Capabilities Scrutinized, Part II," <u>Defense Electronics</u> 11 (December 1979): 54-64; LaRue, "TASVAL," <u>Air Defense,</u> 26-29; and John Taylor, "Gallery of Soviet Aerospace Weapons: Surface-to-Air Missiles," <u>AFM</u> 61 (March 1978): 109.

All of these articles address the weapons instrumentation setup, but Hartman's two-part series is the best. It is a detailed breakdown of how the instrumentation system operated and which Army weapons simulated which Soviet air defense threats. The Taylor and <u>AW&ST</u> articles are included to show that TASVAL simulated all of the low-altitude battlefield threats envisioned at the time (the SA-4, which TASVAL did not replicate, was a mobile battlefield SAM lacking low-altitude capability).

and a "cover" pilot who watched for and shot at threats. At times they even designated "decoy" pilots to distract defenses. Any in-cockpit radar warning indication generated instant evasive maneuvers and use of chaff and flares. The intense air defense environment led the A-10s to rely on the Maverick guided missile more than the gun; its longer range enabled greater standoff. In those situations where the defenses slackened, the Hog drivers used tactics which allowed everyone to attack.<sup>41</sup>

With JAAT, the results were even better. Hog drivers found that the roving Cobra Battle Captain provided even better target information than their own FACs. The Battle Captain also positioned other Cobras as visual references to cue Hog drivers on the best attack axis to follow or the best spot to climb for the attack run. As with JAWS, the Cobras and Hogs covered each other in their respective attacks. Their continuous, random axis attacks confused the defenses and also directed maximum sustained firepower upon enemy armor. JAAT beat TASVAL's surrogate Soviet forces, and helped end any congressional action against the A-10 and attack helicopters due to an alleged inability to fly CAS against European defenses. It was also a remarkable Air Force-Army effort to prove their respective weapons instead of the traditional zero sum interservice squabble.<sup>42</sup>

<sup>&</sup>lt;sup>41</sup>Crawford, "Low Level Attacks of Armored Targets," 12-16 (discusses difficulties of target acquisition during low-level, high air defense threat operations; concludes that special aids for target acquisition are necessary); Dayton, "57 TTW TASVAL," 4-4 through 4-6, 6-3 through 6-9, and 7-3 through 7-5; Hartman, "Airborne AntiTank, Parts I," 53-62; Hartman, "Airborne Anti-Tank, Part II," 59-64; COL Patrick "Doc" Pentland, USAF, telephonic interview by author, 3 June 1997, notes in author's possession; and the following previously cited interviews by author, GEN Adams, BGEN Bahnsen, LTCOL Henry, COL Jenny, COL Lieberherr, and COL Houle.

With the exception of Adams and Pentland, all of the above interviewees participated in TASVAL. Dayton's record of events mentions that one "decoy" action induced a simulated SA-8 battery to fruitlessly fire out all of its allotted shots.

<sup>&</sup>lt;sup>42</sup>Author interviews with Bahnsen, Henry, Houle, Jenny, and Lieberherr. All agreed that JAAT made a big difference in TASVAL success. Other sources are Berry, "TAC and TRADOC Talk a Lot, but Do They Communicate?" <u>AFJI</u>, 28, 30, 36 (Starry and Creech comment upon JAAT and TASVAL); Dayton, 7-5; Drendel, 7; SSGT Bob Hubbert, USA, "JAAT," <u>USAAD</u> 25 (October 1979): 61-64 (sees JAAT as the key to TASVAL success); and Schlesinger, interview by author (observed that after the Hostage Crisis and Soviet invasion of Afghanistan, hard military budget questions disappeared).

# Night/All-Weather Plans, and the Move to Europe

What TASVAL did not resolve was the congressional push for a N/AW CAS plane; the operation occurred during day and fair weather. However, congressional testimony by USDRE William Perry and TAC commander Dixon at least took some pressure off of the A-10. Perry observed that a night requirement did not exist when OSD laid plans for both the A-10 and the soon-to-be-operational hot rod fighter, the F-16. Further, he pointedly reminded the legislators that, if one wanted cheap planes, one could cheat oneself later when extra requirements surfaced. Dixon told Congress that a rugged, simple attack plane like the A-10 met CAS requirements, but added that the INS the pilots wanted could enhance its capabilities.<sup>43</sup>

JAAT required effort and close coordination. COL Lieberherr recalled that during TASVAL, cooperation became so good that the pilots even devised means of visually signalling each other when opposing forces jammed their radio communications. (This is not an easy thing to do, given that even the A-10's relatively slow speed is much faster than a helicopter's speed.) Like CAS, JAAT required constant practice, as revealed in CAPT Gaeta's call for more intensive training to keep JAAT operations safe and effective.

JAAT became a cornerstone CAS tactic, and both during this time and later, various books, defense journals and military professional publications addressed it. Examples (not including previously cited works) are: CAPT Mark Ferrell, USA, "Advanced Joint Air Attack Team: AJAAT," Air-Land Bulletin #88-2 (30 June 1988): 11-14 (describes JAAT using AH-64 Apache helicopters); MAJ William Filippini, USA, and CAPT David Prewitt, USA, "JAAT: A Present Concept," USAAD 28 (November 1982): 2-7; CAPT Robin Gaeta, "JAAT-Playing It Smart," Air-Land Bulletin #87-1 (31 March 1987): 15-18; MAJs Thomas Green and Michael Sullivan, USA, "JAAT: The Joint Air Attack Team Lives!" USAAD 26 (September 1980): 7-9; MAJ Lauren Mullendore, USA, "The Future of the Joint Air Attack Team in the Air-Land Battle" (Defense analytical study, Air War College, 1989); MAJ Gene Patton, USAF, "Close Air Support," U.S. Army Aviation Digest 25 (September 1979): 42-44; CAPT Patrick "Doc" Pentland, USAF, "Joint Air Attack Team Employment and Training in Central Europe During the 1980s," Memorandum for Record, 16 January 1980; MAJ Robert Roper, USAF, and MAJ Gail Tatum, USAF, "The A-10 Close Air Support Mission in the NATO Environment: Is It a Viable Mission" (Research report, Air Command and Staff College, 1980), 30-33 (concludes that JAAT is a key to surviving and winning the CAS battle); William Schlitz, "Lethal Against Armor: The Joint Air Attack Team," AFM 63 (September 1980): 45-53; and Sweetman, 62-63.

<sup>&</sup>lt;sup>43</sup>Perry's assertions are in Congress, Senate, <u>FY 1979 DoD Appropriation, Part 5</u>, 232-233; Senate, <u>FY 1981 DoD Authorization, Part 4</u>, 2249; and Congress, House, <u>1981</u>

Fairchild acted upon the congressional interest by proposing in 1977 an N/AW version of the A-10. The modified plane would carry the extra equipment needed for such operations, as well as the two-man crew required to operate it. The company needed the business for its plane. Congress still balked at funding the full purchase of approximately seven hundred planes, and the Air Force believed that this many planes amply represented CAS commitment within its force structure. Further, the company could not sell the plane overseas, though there were fleeting sale possibilities with countries such as Ecuador, South Korea, and Thailand. These countries were neither willing nor able to buy a plane dedicated to one mission-especially one which most air forces considered low in warfighting priority. Not only this, but one current observer noted that the State Department would probably fight the sale anyway. The plane's purpose so far may have been to resist enemy armored assault, but its "A," for "attack," designation made it an offensive weapon with those Foggy Bottom officials responsible for keeping allies from starting trouble. As a result, Fairchild pressed on with its N/AW A-10 plans, and in 1979 even produced a prototype model for the Air Force to test at Edwards Air Force Base. Though the N/AW Hog flew night, low-altitude, high-threat CAS better than any other plane with the latest such technology, such a mission still required much preparation and all systems in working order. The crewmembers had to match their radar image and INS location information with a small infrared image of the outside world, and then maneuver (gingerly, because these devices could look only so far ahead into a turn) their plane to attack infrared scope symbols which designated the target. (The infrared scope's narrow field-of-view made using it akin to viewing things through a soda straw.) The Hog's speed and maneuverability helped it identify and attack targets with less effort than faster planes, but the infrared screen sometimes blanked if turns were too sharp. This further limited the Hog's maneuver capability, which was its saving feature during daytime operations in a high-threat environment. Combine these problems with the obviously heavy workload, and

DoD Appropriations. Part 5, 379-380; all quoted in Futrell, Ideas. vol. II, 559.

Dixon's comments are in Congress, Senate, FY 1978 DoD Authorization, Part 6, 4499; and Congress, House, <u>1981 DoD Appropriations</u>, Part 5, 379-380; all quoted in Futrell, <u>Ideas, vol. II</u>, 559.

one could see why N/AW high-threat CAS was still not viable. Nonetheless, Congress funded the project through 1982, when the N/AW A-10 project ended due to a combination of factors. Among these were: the A-10 production line ended, the Air Force determined that night tactical air support plan required further development, and other planes appeared which the service preferred for such work.<sup>44</sup>

Note that Fairchild tested the plane for night conditions only. Operating in the clouds prevented the infrared device from seeing anything. The crew would have to use radar which, unlike infrared, provided no "visual" picture of the target area. Even infrared clarity depended heavily upon the relative heat returns of the target and its surroundings, not to mention the nature of the heat return and atmospheric conditions.

<sup>&</sup>lt;sup>44</sup>GEN Allen, interview by author (said that Air Force studied N/AW, but not too seriously; N/AW was better for interdiction); "A-10 Assembly Line Geared for 1982 Peak," AW&ST 106 (7 March 1977): 15 (mentions Fairchild's N/AW proposal); "A-10 Program Unaffected by Crash," AW&ST, 36 (discusses foreign sales efforts); MAJ Howard Barnard, USAF, "Is Tactical Air Support of an Airborne Battalion Feasible in Adverse Weather?" 33-34; "CBO Views Europe Defenses," AFT, 31 January 1977, 12 (mentions initial congressional interest in N/AW A-10); GEN Creech, interview by author (Creech, who was TAC commander during this time, said that he was interested in the N/AW A-10, but was not too serious about it; N/AW CAS was very hard); "The Fairchild Can-Opener," Air International, 287; Futrell, Ideas, vol. II, 560-561 (nice summary of N/AW low-level CAS difficulties; mentions that the Air Force rejected the N/AW Hog because the plane it had in mind would have to perform interdiction missions); David Harvey, "Aircraft for Export: Cutting Off the U.S. Nose?" Defense and Foreign Affairs 8 (April 1980): 45-46 (the "observer" who discussed State Department difficulties); David Harvey, "Dangerous Midnight," Defense and Foreign Affairs 8 (November 1980): 12-15, 43 (recounts Fairchild's efforts on behalf of its N/AW A-10 program); Ramon Lopez, "Night/Adverse Weather A-10 at the Crossroads," Interavia 35 (August 1980): 707-709; "Korea Eyeing A-10," AW&ST 110 (17 September 1979): 48 (also mentions Turkey, Egypt, and Morocco); Robert Ropelewski, "Night/Adverse Weather Version of A-10 Provides Confident Low-Level Operations,"AW&ST 110 (17 September 1979): 46-48, 53-56 (Ropelewski describes his flights in the plane, likes it, but his description reveals heavy cockpit workload); GEN Robert Russ, USAF (ret.), telephonic interview by author, 26 March 1997, recording and notes in author's possession (as Deputy Chief of Staff for Research and Development in the early 1980s, dealt with force structure issues as they pertained to procurement; said that the Air Force A-10 buy provided enough planes to meet CAS force structure); Sweetman, 48-51 (excellent summary of Air Force A-10 purchases, Fairchild-Republic's foreign military sales difficulties and N/AW A-10's fate); and Wessely, "Limiting Factors," 1-21.

In the meantime, one might wonder that, if OSD and the service tested the Hog so hard for Europe's poor-weather and high-threat conditions, did these agencies ever do anything more than occasionally deploy A-10 units there? By 1977, OSD was so concerned about the Soviet conventional superiority in Europe that it ordered studies on permanently basing A-10s somewhere on the Continent. Exercises like TASVAL answered some of the basic questions about the A-10 and European warfare, whether A-10 units were stationed in Europe or not. The more basic issue involved how to base the A-10s in Europe. Since the plane was supposed to operate from austere locations, just how far did the service want to go with this concept? A diverse basing scheme met the desire for basing A-10 units closer to the Army units that they supported, and it also answered NATO planners' concerns about air base availability after a Soviet air assault. Big American bases like Ramstein in Germany and Lakenheath in England were already crowded with planes and expected heavy attacks. On the other hand, austere basing's major pitfall involved logistical support. This was an issue that arose in the 1971 Senate CAS Hearings, as well as in hearings on the Enforcer. It was one thing to say that the CAS plane could operate from rough fields, but quite another to consistently provide fuel, ordnance, maintenance facilities, and parts to numerous isolated bases in order to keep CAS planes flying and fighting.<sup>45</sup>

After numerous studies, the Air Force compromised. A large A-10 wing at a Main Operating Base (MOB) would routinely deploy flights (up to seven aircraft), and

<sup>&</sup>lt;sup>45</sup>"A-10 Deployment," <u>AW&ST</u> 107 (19 September 1977): 53 (small sidebar article reports Air Force intention to permanently deploy A-10s to Europe and wonders about basing, since other American bases are crowded); "A-10s Set for European Deployment in January, but USAF Buy May End in FY 81," <u>AFJ</u> 116 (December 1978): 17 (Defense Secretary Harold Brown cites the A-10's tank killing potential as a big reason for basing it in Europe); Christie, interview by author (recalls that initial Air Force intention was to base F-16s with tactical nuclear weapons, and that OSD forced a change to a more conventional force structure); MAJ Kenneth Engle, USAF, and COL Orin Patton, USAF, "Basing the A-10 in Europe: Strategic and Mobility Problems," <u>AUR</u> 31 (March-April 1980): 82-85; Schlesinger, interview by author; Sweetman, 46-48, 52-53; and "Where USAF's New A-10s Fit in NATO Defense," <u>AFJI</u> 116 (June 1979): 18 (also mentions desire to have the A-10's tank-killing power readily available in Europe).

occasionally squadrons (approximately twenty planes), for training at various Forward Operating Locations (FOLs). Thus, the A-10s would have a central location for training and logistical support. Routine FOL deployments allowed practice of combat logistical resupply, and guaranteed the pilots' familiarity with the terrain and friendly ground units of their particular sector. Such operations, combined with the A-10's slow speed and maneuverability, enabled pilots to fly confidently in weather which would ground nearly all other air support planes.<sup>46</sup>

The service validated the FOL concept in April 1978 when it deployed Hogs from its first operational A-10 unit, the 354th Tactical Fighter Wing at Myrtle Beach, South Carolina, to simulate such operations at Shaw AFB across the state. That January, the 354th passed its Operational Readiness Inspection (ORI) to ratify the combat-ready status that it attained ahead of schedule the previous October. Most impressive during this build-up to formal readiness was the plane's high sortie rates, which its simplicity and easy maintainability guaranteed. (A sortie is one aircraft mission.) The Shaw evaluation also demonstrated the same thing, as pilot, and not aircraft, availability limited sortie totals.<sup>47</sup>

The gun was one other issue available to skeptics of the A-10's worth in Europe, as well as to congressmen intent upon limiting the total A-10 buy. The A-X concept planners

<sup>&</sup>lt;sup>46</sup>Engle and Patton, "Basing the A-10," <u>AUR</u>, 82-85; COL Robert Rasmussen, USAF, "The A-10 in Central Europe" A Concept of Deployment-Employment," <u>AUR</u> 30 (November-December 1978): 27-44; COL Robert Rasmussen, USAF, "The Central Europe Battlefield," <u>AUR</u> 29 (July-August 1978): 2-20; and Sweetman, 52-53, 60-62.

At the time he wrote for the <u>AUR</u>, COL Rasmussen was assigned to the Deputy Directorate for Force Development in the Directorate for Plans, Headquarters Air Force. As such, his ideas represent the thinking behind the A-10 European basing concept. In the "Central European Battlefield" article, Rasmussen matches the then-current Army doctrine by emphasizing direct strikes against the Soviet attack--there would be no time to await the effects of interdiction attacks.

<sup>&</sup>lt;sup>47</sup>Drendel, 6-7; "First A-10 Squadron Operational Ahead of Schedule Despite Transition Difficulties," <u>AW&ST</u>, 208-212 (the "difficulties" were lack of an INS, weapons ranges, and engine thrust; however, the plane still impressed both pilots and maintenance people); and LT Patrick "Doc" Pentland, USAF, "A-10 Completes FOL Validation Test," <u>TAC ATTACK</u> 18 (December 1978): 18-20 (this is the same Pentland from the author interview).

devised gun specifications which apparently accounted for the more low-threat arena of Vietnam-style CAS. The gun's shells worked best in medium-altitude, high-angle dive attacks against a tank's more vulnerable upper sections. (The thickest armor is at the forward turret and upper front chassis; tank designers expect it to face the enemy, and they save weight and improve mobility by reducing armor thickness on the rest of the turret and rear chassis where enemy ground shell hits are less likely.) The 1974-1975 live fire attacks against tanks used such higher-angle deliveries, and one observer wondered how A-10s could survive conducting attacks so high in the air when facing tough defenses. Therefore, the question remained as to whether the gun could destroy tanks in the shallow angle attacks required to avoid antiaircraft coverage. The second gun issue concerned renegotiation of ammunition contracts, and keeping cheap the large ammunition buys needed for proficiency training and combat reserve. Since this was *still* the time of the Enforcer hearings and the TASVAL test, congressional and other enemies might stop yearly purchases altogether.<sup>48</sup>

<sup>&</sup>lt;sup>48</sup>"A-10 Program Unaffected by Crash at Paris Show," <u>AW&ST</u> 36; DCP 23, 12-13; Dilger, "Tank Killer Team," <u>National Defense</u>, 191; Hogg, <u>Tank Killing</u>, 8, 20; Kocivar and Rhea, "A-10 Ready for Attack," <u>Flight International</u>, 1191; Pentland, "Evolution of A-10 Mission Requirements"; CAPT Carl Pivarsky, Jr., USAF, "30mm Gun Employment," <u>FWR</u> (Fall 1984): 26-32; Dr. Russel Stolfi, Dr. John Clemens, and Raymond McEachin (Combat Damage Assessment Team), "A-10/GAU-8 Low Angle Firings Versus Individual Soviet Tanks, February-March 1978" (WPAFB: A-10 SPO Armaments Directorate, n.d.), 1-2, copy in author's possession; and the following interviews by author: Christie, Dilger, LTCOL Henry, COL Jenny ("observer"), Oates, Pentland, and Stolfi.

Oates wrote the test plan for the Lot Acceptance Verification Program (LAVP) test which aimed to answer the gun skeptics. He recalled that the test was a "save the program" event. Christie believed that LAVP was driven by an Army challenge to the gun. The challenge was in turn driven by the Army's desire to control GAU-8A round production, as well as that service's effort to show the antitank advantages of its new attack helicopter, the Apache. This has merit, for as shall be seen, Army helicopter advocates frequently boasted of the Apache's antiarmor lethality versus the A-10. LTCOL Henry was the schedules officer for the LAVP tests, and recalled the pressure to prove the gun or possibly face funding consequences.

The journal articles discuss the A-10 congressional funding schedule for the 1978-1979 timeframe. Pentland asserted in both the 1988 staff memo and the author interview that the gun's initial intent was for dive deliveries. The basis for this is the

If Colonel Bob Dilger shared credit for the gun's good fortune during the A-10's preoperational-operational days, he earned greater distinction for its success after the Hog became operational. As Chief of the A-10 SPO's Armaments Directorate, he orchestrated a test, the Lot Acceptance Verification Program (LAVP), which not only validated the 30 mm rounds' projected effects but also proved that the A-10's GAU-8A could destroy Soviet tanks in low-altitude, shallow dive angle attacks. LAVP project officer, Captain Lonnie Ratley, joined the Directorate after visiting the A-10 SPO for research supporting his Naval Postgraduate School thesis. The thesis addressed Ju-87 Stuka Eastern Front antitank operations, and concluded that the Stuka did well against tanks. It also predicted equal success for the A-10. For LAVP, Ratley invited his graduate advisor, Dr. Russel Stolfi, a Marine Corps Reserve officer and History Ph.D. who had surveyed damaged and destroyed Arab tanks after both the June, 1967 and October, 1973 Arab-Israeli Wars. Stolfi provided the same sort of rigorous damage assessment that he accomplished in the Mideast. (He discounted nearly all of the Israeli airmen's tank claims.) Stolfi did not want a "technical event," such as a computer study. He wanted "an effectively constructed simulation of an historical event," and insisted that the tanks, the planes, and the tactics match combat conditions as much as possible. Dilger obliged him, as the A-10 Armaments Directorate overcame the now-familiar resistance from Eglin Armaments Lab people who

requirement for maximum accuracy at four thousand feet slant range, which corresponds to certain dive recovery altitudes. DCP 23 states a preference for steep dive gun attacks in order to strike a tank's more vulnerable top side. Dilger confirmed the harmonization of the gun for four-thousand feet, but did not say it was for dive deliveries.

The author believes the designers did not explicitly create the gun for dive deliveries. As described in the previous chapters, the gun was a compromise of size, expense, and lethality. Certainly, one prefers shooting a tank from a steep dive angle; the tank's crewmembers cannot see their attacker and the shells hit vulnerable areas. But as CAPT Pivarsky points out in his essay, even some dive deliveries can hinder gun effectiveness due to the obliquity of impact. (Instead of a perpendicular impact, the shell strikes at an angle which forces it to travel through more armor or makes it ricochet.) The important thing is to hit the tank's vulnerable areas, if possible. Nonetheless, the author agrees that in the late 1970s, people believed that low angle attacks were a serious issue because the Air Force had not addressed them in the 1974-1975 firings (see Stolfi, Clemens, and McEachin).

wanted the test done differently. LAVP tests ran intermittently between 1978 and 1982, and conclusively proved that the GAU-8A worked as advertised. Shots hitting the heavily armored forward turret of T-62 tanks were not effective; but given the GAU-8A's shell size and velocity, no one had ever claimed that they would be. The GAU-8A was not as big as a tank's cannon, of course. But unlike a tank, an A-10 could maneuver quickly for a better shot. And during LAVP, A-10 shots on the tanks' sides and rear were very successful, as shells tore through the treads, engine, fuel tanks, and the more lightly armored turret sections.<sup>49</sup>

The test used T-62 tanks in the early stages and American M-47s later on; this was due to limited T-62 availability. As such, the test team did not put live ammunition in the tank's magazines, but instead used dummy rounds. Stolfi analyzed every shell impact just as he had in Israel. The LAVP not only assessed individual A-10 attacks upon tanks but also attacks against tank and armored personnel carrier arrays. The effectiveness rating used three classifications. A Mobility Kill (M-Kill) is when a tank can no longer execute controlled movement; a Firepower Kill (F-Kill) occurs when the tank cannot direct controlled fire from its main gun; and a Catastrophic Kill (K-Kill) means that the tank is destroyed and cannot be repaired. The 1978 T-62 LAVP test featured K-Kills for all rear aspect attacks, and a combination of M-Kills and F-Kills for side attacks.

The issue of credit arose here as well. Another Directorate officer--MAJ Richard Hackford--thought up LAVP, and Dilger assigned Ratley as project officer. Dilger's own account to the author seemed confused as to dates and events; he mixed up the earlier

<sup>&</sup>lt;sup>49</sup>Elko and Stuelpnagel, "Ammunition Costs," 52; LTCOL Alexander McDermott, USAF, "The Avenger Cannon," FWR (Fall 1978): 13 (discusses initial LAVP lessons; one round did "kill" a tank in four of ten cases, but the real damage occurred when multiple rounds hit a tank); CAPT Lonnie Ratley, USAF, "A Comparison of the USAF Projected A-10 Employment in Europe and the Luftwaffe Schlachtgeschwader Experience on the Eastern Front in World War Two" (Ratley's Naval Postgraduate School thesis, previously cited); CAPT Lonnie Ratley, USAF, "A Lesson for Today? Air Power at Kursk," Military Review 58 (April 1978): 54-62 (derived from his thesis); CAPT Lonnie Ratley, USAF, "The 'A-10 Pilots Coloring Book' Christmas 1977, or 'What You Always Wanted to Know about the T-62 but Were Afraid to Ask," A-10 Formal Training Unit (FTU) pamphlet, n.d., in author's possession (displays T-62 vulnerable areas); COL Lonnie Ratley, USAF (ret.), telephonic interview by author, 29 July 1998, notes in author's possession; Stolfi, Clemens, and McEachin, "A-10/GAU-8A Low Angle Firings Versus Individual Soviet Tanks," passim; CAPT AI Whitley, USAF, "A-10 OT&E [Operational Test & Evaluation] TD&E [Tactics Development & Evaluation]," FWR (Fall 1977): 34 (writes about upcoming LAVP test and intentions to not only evaluate rounds but also answer operational questions); and the following interviews by author: Dilger, Henry, Oates, Stolfi, and Whitley.

Dilger reduced ammunition costs further, and used the LAVP testing to guarantee good products. During the A-10's developmental stage, the SPO chose civilian competitive contracting for shells instead of using the Army, which normally produced this caliber ammunition for all of the services. The reason for the switch was the Army's poor quality control, which bred high costs and delays. After the A-10 became operational, the Army still produced the GAU-8A rounds' percussion caps; but when testing revealed defects in these, Dilger "fired" the Army and brought in another civilian company to make them. LAVP also discovered that the shell tips of some ammunition lots broke away during firing. Like the Army items, Dilger and the SPO quickly rejected these. But instead of performing a costly and lengthy study, they directly worked the fix through the contractors. The benefit was not only in fiscal savings. As Dilger and others recalled, these discrepancies could have incurred serious problems during combat, or even during training. Bad percussion caps caused barrel explosions, while shell tip breakage destroyed accuracy and created particles which damaged jet engines. Concerning the contractors, Dilger modified the competitive bidding procedure-the contract was renegotiated yearly during the late 1970s-to provide an extra 10 percent of the total production amount to the winner. Considering that a contract often involved over a million rounds, this incentive was significant. He worked around military specifications for the shells if this maintained quality while reducing cost. As a result, the cost per GAU-8A round remained at one-fifth the early-1970s original cost estimate-from over eighty dollars to consistently less than fifteen dollars. Dilger also oversaw a shell packaging cost reduction to one-fourth of the original estimate. He used the resulting GAU-8A budget surplus to sustain large ammunition lot buys, and then shifted to multiyear contracts in 1980. These actions created an economy of scale and guaranteed consistent purchase amounts instead of the more common feast-famine procurement cycle which induced high purchase costs. By all accounts, Dilger ran around, over, and through rules and officials, and used sympathetic Pentagon contacts to help get his way. He kept the GAU-8A rounds cheap and effective,

<sup>1974-1975</sup> tests with the later ones. However, other accounts cite his drive in making LAVP happen.

but his abrasive, driven style antagonized superiors and earned him an early retirement to an Ohio farm.<sup>50</sup>

If the gun was a success story, the Hughes Aircraft Corporation's Maverick missile that was its more high-technology counterpart in the A-10's antitank arsenal had a more rocky history. The Maverick concept was attractive: use a television camera in a missile's nose to track a visually contrasting object and thus guide that missile to its target. The pilot achieved "lock-on" onto the object via a cockpit TV screen which displayed the Maverick's TV seeker's view, fired the missile, and then escaped while the missile did its business. The result would be target destruction while the attacking aircraft, having fired the missile outside of lethal AAA and tactical SAM range, survived. The Israelis used Mavericks with apparently mixed results during the October War, and the U.S. Air Force, seeing an answer to the tactical air defense problem, pressed for large-scale Maverick production. The problem concerned seeing and locking targets with this device. At the longer ranges, one could not recognize the objects on the cockpit TV screen. Additionally, the target had to contrast visually with its surroundings. The Israelis might have been able to discern and lock on to tanks which stood out in the desert, but shooting camouflaged tanks on an

<sup>&</sup>lt;sup>50</sup>Coates and Killian, <u>Heavy Losses</u>, 154-155, 172-173; "Cost Cutter," <u>Time</u>, 7 March 1983, 29; Elko and Stuelpnagel, 52-54 (high praise for the later contracting setup); Frank Greve, "A Career Cut Short by a Job Well Done," <u>San Jose Mercury</u>, reprinted in <u>More Bucks, Less Bang</u>, ed. Rasor, 284-288 (page references are to reprint); Peter Rodman, <u>More Precious than Peace: The Cold War and the Struggle for the Third World</u> (New York: Charles Scribner's Sons, 1994), 336; LTCOL James Sbolka, USAF (ret.), telephonic interview by author, 5 June 1997, notes in author's possession (Sbolka worked weapons effectiveness issues at Air Force Pentagon Headquarters, and was familiar with Dilger's intentions for LAVP); and the following interviews by author, Buchta, Dilger, Oates, and Ratley.

Dilger's handling of his budget surplus is also remarkable. Normally, a higher authority uses a subordinate department's surplus for other operations, but Dilger successfully resisted this.

Rodman's work and the Ratley interview reveal a bittersweet postscript to Dilger's rambunctious style and postservice years. Dilger devised a gun for Afghan Rebels to use against the Soviet troops invading their country. He tried to sell it to the U.S. government, and drove around with both it and its ammunition in the back of his vehicle. While carelessly handling a round at a gas station, he accidently set it off, blowing up the gas station (Dilger survived).

overcast day in Europe was another matter. In 1977, Hughes introduced a modified missile, the Imaging Infrared (IIR) Maverick, which used an infrared seeker to track objects which thermally contrasted from their surroundings. The problem remained the same. Many factors determined a vehicle's thermal appearance, and these often combined to create an image which did not resemble a vehicle. Further, conditions might be such that the vehicle did not thermally stand out from its surroundings, thus hindering lock on. The result was a series of congressional hearings and critical news reports--at forty thousand dollars apiece, Maverick missiles were high interest items. However, the service pressed on with a weapon that it considered its best chance for tactical air support success against tough air defenses.<sup>51</sup>

<sup>51</sup>GEN Allen, interview by author; Battista, interview by author (congressional staffer, participated in congressional hearings critical of Maverick); Coates and Killian, 155-157; Cordesman and Wagner, The Lessons of Modern War, Vol. I, 95 (skeptical of Israeli Maverick claims); Futrell. Ideas, vol. II, 559-560 (nice summary); Mintz, "The Maverick Missile," in More Bucks, Less Bang, ed. Rasor, 135-185 (highly critical of the Maverick); Nordeen, Air Warfare in the Missile Age, 168 (more generous to Israeli claims); V.H. Reis, "Close Air Support Systems: A First Order Analysis," (Lexington, Mass.: MIT Lincoln Laboratory, 19 February 1980), 29, 32, 35 (criticizes both the GAU-8A and AGM-65 for various weaknesses--both have some standoff capability but require good tactics to exploit it, and both are not really suitable for N/AW work--but seems to prefer the GAU-8A and its lethality); CAPT Rod Shraeder, USAF, "Using the AGM-65D in Combat," 81st Tactical Fighter Wing (TFW) training pamphlet, 6 January 1987, in author's possession; Richard Simpkin, Antitank: An Airmechanized Response to Armored Threats in the 90s (Oxford: Brassey's, 1982), 212 (this remarkable piece does not even mention the GAU-8A, but instead praises the Maverick's potential); Sweetman, 39-42; and U.S. Air Force, TAC Headquarters Training Directorate (HQ TAC/DOT), "A-10 AGM-65D IR Maverick Training Program," (July 1984), MAFB, Air University Library Holding #M-42844-455-U (training pamphlet discusses IR complexities).

The official designations for the Electro-Optical (EO) Maverick versions were the AGM-65A and AGM-65B, while the IIR Maverick was designated the AGM-65D. A later Maverick model, the AGM-65G, carried a bigger warhead and incorporated IR target tracker modifications. Nearly all Air Force ground attack planes--the A-10, F-4, F-16, and F-15E--carried the missile. The Maverick remained a difficult weapon to employ well, as evidenced by <u>Fighter Weapons Review</u> articles addressing how best to exploit its strengths and/or handle its idiosyncrasies; see LTCOL Michael Blohm, USAF, "AGM-65D Algorithms for Aircrews: An Aircrew Oriented Look," (Spring 1990): 10-14 (a reminder to pilots of the IIR Maverick's criteria for achieving target lock); CAPT Ralph Hansen, USAF, "The AGM-65A/B Television Maverick: It Isn't Dead Yet!" (Summer 1993):

## The A-10 Wing in Europe

The Air Force worked hard to make its CAS plane succeed in Europe. The European Main Operating Base for the A-10 was actually two closely located American bases in British East Anglia, Royal Air Force base (RAF) Bentwaters and RAF Woodbridge (the two were within five miles of each other, and the "RAF" designation was due to basing agreements with the British). The setup required two bases because the command in charge of A-10 operations, the 81st Tactical Fighter Wing (TFW), would be the largest tactical fighter wing in the service. The 81st already existed as a three-squadron F-4 wing, but it expanded to six squadrons as it switched to A-10s. The transition began in January 1979, as the 92nd Tactical Fighter Squadron (TFS) began operations. To show its commitment to Army support, the 81st immediately deployed 92nd TFS planes to Germany to support an Army exercise. The Germany deployment underscored the Forward Operating Location (FOL) part of the A-10 operational setup in Europe. The 81st routinely deployed A-10s to four German FOLs arrayed from north to south: Ahlhorn, near Bremen; Nörvenich, near Cologne; Sembach, near Wiesbaden; and Leipheim, near Ulm. The 81st's squadrons each flew from one specific FOL. In this way, the pilots became intimately familiar with both the terrain and the NATO ground units for that FOL's sector.52

<sup>20-23 (</sup>a review of how the older Mavericks operate); CAPT Bruce Hennigar, USAF, "IR Maverick--It's All Done with Mirrors and Magic," (Winter 1984): 2-5 (the journal's introduction to IR Maverick); CAPT Mike Isherwood, USAF, "Combat Hammer: Tactical Maverick Execution," (Winter 1988): 5-8 (emphasizes good preparation for any Maverick shoot); and MAJ Ken Schanke, USAF, "Forced Correlate," (Summer 1992): 26-29 (involved discussion of how to best use the tracker modification).

<sup>&</sup>lt;sup>52</sup>F. Clifton Berry, Jr. "The 81st Tactical Fighter Wing," <u>AFJI</u> 116 (June 1979): 17-18; David Brown, "A-10 Crews Sharpen Air Support Skills," <u>AW&ST</u> 110 (2 April 1979): 37-39; Drendel, 7; Mark Lambert, "A-10s in the German Front Line," <u>Interavia</u> 36 (November 1981): 1146; William Schlitz, "Getting A-10 Firepower Forward," <u>AFM</u> 66 (July 1983): 44-51; Sweetman, 47-48, 57, 60-62; BGEN Rudolph Wacker, USAF, "A-10 Close Air Support Operations in Europe," <u>AFM</u> 62 (August 1979): 73-77 (Wacker commanded the 81st during the A-10 transition); Graham Warwick, "The A-10 and Europe," <u>Flight International</u> 115 (3 November 1979), reproduced as a Fairchild-Republic Corporation brochure; Graham Warwick, "A-10: Europe's Anti-Tank Vanguard," <u>Flight</u>

The Air Force and the 81st's pilots understood the challenges facing good CAS plane operations in Europe and rose to meet them. The A-10's own excellent fuel endurance and maintainability ironically became potential problems, as pilots found that repeated long (for tactical jets--approximately two hours) low-level flights in poor weather induced high fatigue. The Hog far surpassed other jets for operating in marginal weather, but flying in such conditions required skill and concentration. The 81st ensured that the transition to A-10s included a judicious balance of experienced and junior pilots, in order to establish and maintain an effective and safe pilot force. Another A-10 strength which created a small problem was its gun. The GAU-8A quickly destroyed training targets that withstood many hits from other aircraft guns. Tight European defense budgets did not allow for frequent target replacement, and weapons ranges restricted A-10 strafing until they could obtain suitable targets.<sup>53</sup>

As the 81st accepted the Hog, other units also transitioned to the new plane. The 23rd TFW at England AFB, Louisiana, switched from A-7s to A-10s in 1978, and both it and the already-formed 354th TFW at Myrtle Beach trained for combat contingencies in Europe and elsewhere in the world. Later, in 1983, A-10 squadrons formed in both Alaska and Korea. But European operations and the reported tough Soviet air defenses dominated American thinking. Thus, the Air Force always ensured that the 81st was the first A-10 unit to receive all of the best and newest tactical equipment: chaff and flare dispensers, radar jamming pods, the IIR Maverick, and the INS.<sup>54</sup>

International 115 (24 February 1979): 523-524.

<sup>53</sup>Brown, "A-10 Crews Sharpen Air Support Skills," <u>AW&ST</u>, 37; LTCOL Hennigar, interview by author; Schlitz, "Getting A-10 Firepower Forward," <u>AFM</u>, 50; Sweetman, 47; and "Targets Lacking," <u>AW&ST</u> 110 (2 April 1979): 38.

<sup>54</sup>Drendel; 6-7; "Gallery of USAF Weapons," <u>AFM</u> 58 (May 1975): 115-116; "Gallery of USAF Weapons," <u>AFM</u> 62 (May 1979): 119-120; "Gallery of USAF Weapons," <u>AFM</u> 65 (May 1982): 156-157; "Gallery of USAF Aircraft," <u>AFM</u> 66 (May 1983): 150-151; "Gallery of USAF Aircraft," <u>AFM</u> 75 (May 1992): 142; LTCOL Hennigar, interview by author; and Sweetman, 47-48.

The A-7s went to Air National Guard (ANG) and Air Force Reserve units, just as GEN Dixon said they would. Indeed, the Texas congressional delegation dictated A-7

For their part, the 81st's pilots seriously prepared for European combat. Incorporating lessons from TASVAL, they almost exclusively practiced low-level attack tactics, and were aware of and used terrain just like their Army clients. They flew JAAT, and practiced good formation and various attack schemes designed to outwit enemy gunners. Their weapons delivery practice emphasized minimum run-in times to reduce vulnerability during attack runs. They understood that a European war might entail heavy losses, but they believed that their training, tactics, and their plane's unique construction would keep them from suffering greater losses than any other NATO aircraft. After all, if the defenses were as fearsome as some estimates indicated, one wondered what attack plane could survive. Further, Hog drivers believed that they would inflict as much damage as they received. They knew that their plane was rugged enough to withstand hits, and they planned to use their gun to exploit the weaknesses of Soviet tanks--and even the infamous (from the 1973 October War) multi-barrelled, radar-guided ZSU-23/4 air defense cannon. Still, they liked having the potential for standing off from the enemy and striking an accurate blow. Thus, they wanted to carry the Maverick, in spite of that missile's problems; and the 81st TFW's preferred combat weapons configuration included both gun and Mavericks.<sup>55</sup>

purchases to the Air Force through the early 1980s; see George Wilson, "Opponents Find Vought Corporation's A7 [*sic*] Impossible to Shoot Down," <u>The Washington Post</u>, 13 March 1981, A3. There were A-7s in the Guard and Reserves through the early 1990s. A-10s started entering Guard and Reserve in 1982; and ultimately nine units used them.

<sup>&</sup>lt;sup>55</sup>Previous and newly cited author interview sources are as follows: MAJ John Allison, USAF, telephonic interview, 20 May 1997, notes in author's possession (81st TFW pilot and weapons officer, 1984-1988; weapons officer at 10 TFW, RAF Alconbury, after the 81st split into two wings in 1988); COL Bass (81st TFW pilot, early 1980s; observed that the air defense estimates made any air attack seem impractical); LTCOL Condon (weapons officer at 10th TFW, 1988-1991); COL Charles Fox, USAF, personal interview, MAFB, 10 April 1997, recording and notes in author's possession (81st TFW weapons officer, 1985-1986); LTCOL George (81st TFW weapons officer, 1985-1988; USAFE staff for A-10 weapons, 1988-1991); LTCOL Hennigar (81st TFW pilot from A-10 arrival to 1981); COL Lieberherr (81st TFW squadron commander [91st Tactical Fighter Squadron], 1985-1987; wing operations staff, 1988); Dar Kemp, telephonic interview, 27 March 1997, recording and notes in author's possession (81st TFW pilot,

## The Air Force and Its CAS Plane in the Late 1970s/Early 1980s

It was not that the service completely forgot about A-10s elsewhere. As mentioned, it set up wings in the United States with world-wide operational responsibilities; and it created a squadron in that other perennial hot-spot, Korea. However, Korean CAS tactics were reminiscent of Vietnam, since North Korea lacked the sophisticated air defenses and mobile warfare opportunities of the Soviets in Europe. Indeed, the rugged Korean terrain channelled any communist assault into well-known avenues of approach, thus easing overall the American and South Korean defense effort.<sup>56</sup>

The "Coloring Book" offers Hog drivers tips on evading or *shooting* ZSU-23s. It notes the ZSU's thin armor. (It looked like a small tank, with four machine guns protruding from the turret instead of a large cannon.) It also notes the ZSU's difficulty in tracking fleeting or maneuvering targets, as well as its need for constant maintenance. Also, its requirement for location in exposed areas to give it better tracking opportunities in turn made it an obvious target. And if a ZSU hit an A-10, the Coloring Book cited the early-1970s survivability tests in asserting that the A-10 could sustain hits better than any other plane.

<sup>56</sup>MAJ James Spencer, USAF, "Army Field Manual 100-5 vs. Sun Tzu: Operational Problems Facing Korea AirLand Battle Planners" (Research report, Naval War College, 1988), 4-12, 16-19 (notes terrain and North Korean fighting style, which favors CAS against forces massed within approach corridors); and the following interviews by author: LTCOL George, LTCOL Hennigar, and LTCOL Wilson (noted that preferred weapons included bombs, which meant that the planes intended to overfly the target rather than stand away from it).

<sup>1985-1988; 10</sup>th TFW pilot 1988-1991); MAJ Koechle (81st TFW pilot, 1985-1989); LTCOL Wilson (81st TFW pilot from A-10 arrival to 1982); MAJ Jefry "Rowdy" Wykstrom, USAF, telephonic interview, 26 March 1997, notes in author's possession (81st TFW pilot, 1983-1987); and MAJ Kent Yohe, USAF, telephonic interview, 3 April 1997, notes in author's possession (81st TFW pilot, 1986-1989).

Other sources are Armaments Systems Division (ASD), "Christmas 1978: The A-10 Pilot's Multi-Color Guide to Touring in Central Europe, or Are ZSU-23/4 Drivers Really Ten Feet Tall?" (WPAFB: ASD, n.d.); Brown, "A-10 Crews Sharpen Air Support Skills," 37-39; Builder, <u>The Masks of War</u>, 120-121 (remarks that when he interviewed Air Force pilots in Europe, Hog drivers were the only ones who realistically assessed war with the Soviets and prepared for it); Lambert, "A-10s in the German Front Line," <u>Interavia</u>, 1143-1145; LTCOL Thomas Lyon, USAF, "The Battlefield Bruisers" interview by Alfred Price, in <u>Air Battle Central Europe</u>, by Alfred Price (New York: The Free Press, 1986), 92-101; Schlitz, "Getting A-10 Firepower Forward," 45-47; Sweetman, 46-47, 52-63; and Wacker, "A-10 Close Air Support Operations in Europe," 74-77.

On the other hand, the European situation scared American military leaders throughout the 1970s, and continued to dominate American warfighting preparation into the 1980s. The Soviets' overwhelming superiority in tanks promoted a high degree of Air Force-Army cooperation, especially when it came to supporting a CAS plane. The Army needed the A-10, for though its Cobra attack helicopter carried antitank weapons, the Advanced Attack Helicopter that the Army really wanted for this role remained trapped in budget and developmental problems. Indeed, one could say that the lean 1970s military budgets also played a part in the Air Force's attitude, since the service had to defend its CAS plane against various challenges. These in turn forced the service to deliver on its promise of a cheap but effective CAS plane. Even after the plane became operational, the Air Force proved its weapon against any remaining skeptics via postproduction tests of tactics and the gun. The A-10 may have been a plane conceived during a relatively low-intensity Asian war, but the military and political influences of the 1970s ensured that it was a plane which could excel at CAS in a much more hostile environment.<sup>57</sup>

The Air Force not only tried to make the A-10 a success in Europe, but it also generated journal articles to ensure that others accepted the idea as well. For example, the Air Force Association published several articles in its periodical, <u>Air Force Magazine</u>, touting the A-10's chances in that theater. These efforts during the late 1970s and

All three interviewees flew A-10s in Korea. LTCOL Hennigar mentioned that the Alaska A-10 squadron also supported Korean operations.

Unlike A-10s in Europe, Hogs in Korea generated no defense journal interest.

<sup>&</sup>lt;sup>57</sup>Bradin, <u>From Hot Air to Hellfire</u>, 133-154; J. Phillip Geddes, "AH-64: The US Army's Advanced Attack Helicopter," <u>IDR</u> 11 (August 1978): 1249; Gunston, <u>AH-64</u> <u>Apache</u>, 5-8; Lambert, "A-10s on the German Front Line," <u>Interavia</u>, 1145 (notes that the Army supports the A-10 because it is the one fixed-wing aircraft dedicated to CAS); Benjamin Schemmer, "Army's YAH-64 Attack Helicopter Survives DoD Attempt to Kill It," <u>AFJI</u> 117 (24 January 1980): 24.

Bradin recounts 1970s Cobra modifications and Apache's initial travails. On page 150 he cites the Carter administration's skepticism toward, and budget cuts of, the AAH program; and he also hints that Defense Secretary Harold Brown preferred the A-10, as he describes Brown as the "godfather of the A-10." All of the above Apache accounts note that it was nearly as complex as the Cheyenne.

early 1980s represented the zenith of Air Force interest in traditional CAS: supporting troops at or within a few miles of the battlefield. The evidence was its support for the plane designed for this mission, the A-10. Observers have also noted that the time was a high point for the traditional CAS mission's foundation, Air Force-Army relations.<sup>58</sup> Ironically, the condition which in turn motivated these good feelings, the Soviet threat in Europe, would also generate new interservice warfighting ideas which threatened the A-10 CAS plane just as the Hog achieved fully operational status. The Air Force and Army wanted a more flexible battle doctrine which emphasized deep attacks against Soviet rear echelon forces, and wanted a new airplane to accomplish this. The A-10 would thus find itself in yet another fight for its life.

<sup>&</sup>lt;sup>58</sup>The <u>AFM</u> articles are Beavers, "The A-10--Monstrosity with a Mission," (February 1980); Schlitz, "Getting A-10 Firepower Forward," (July 1983); "Lethal Against Armor," (September 1980); and Wacker, "A-10 Close Air Support Operations in Europe," (August 1979). Other, not previously cited articles, are MSGT Lorenzo Harris, USAF, "Those Non-Stop Knuckle-Busters," <u>Airman</u> (April 1985): 40-41 (some praise for A-10 maintenance reliability); MSGT Lorenzo Harris, USAF, "Wart Hogs!" <u>Airman</u> (April 1985): 36-39; TSGT Jim Katzman, USAF, "Groundwork for the Future," <u>Airman</u> (January 1986): 44-47 (ironically, article appears just as service's leaders start to turn against the plane); MGEN Thomas McMullen, USAF, "TACAIR Outlook," <u>Astronautics and Aeronautics</u> 16 (September 1978): 21-22; Murray Rubinstein, "Ugliest Plane in the Air Force," <u>Mechanix Illustrated</u> (February 1977): 64-65, 132; and CAPT John Taylor, USAF, "The Mean Machine," <u>Airman</u> (September 1977): 20-28.

The observers are Davis, <u>31 Initiatives</u>, 25-33; and Winton, "Partnership and Tension," <u>Parameters</u>, 100-111.

# CHAPTER VIII FIRE IN THE MINDS OF MEN,<sup>1</sup> 1979-1990

By 1983, there were Air Force A-10 units around the world, and it appeared that the Warthog might enjoy a long service life accomplishing its close air support mission. Indeed, the American military buildup during President Ronald Reagan's administration seemed to guarantee it. However, doctrinal and technological developments both within its own service, the Air Force, and within the service it ostensibly supported, the Army, troubled its operational future. The same Reagan buildup ensured production of two new machines, the Air Force's F-16 Fighting Falcon multipurpose jet and the Army's AH-64 Apache advanced attack helicopter, both of which would directly challenge the Hog's claim as America's premier CAS aircraft. An aggressive spirit among Army leaders produced a new warfighting doctrine, called AirLand Battle, in 1982. AirLand Battle reflected not only the Army's fear of overwhelming Soviet reserves on the European battlefield, but also its confidence that it could--with good training and new weapons such as the Apache--stop Soviet forces at the point of contact. As such, AirLand Battle emphasized an offensive spirit featuring joint air and ground attacks upon Soviet follow-on forces in a pell-mell fight with no well-defined battle line.

Ironically, the Air Force and Army cooperative spirit which helped beget the Hog also combined with these developments to threaten it. In 1984 and 1985, extensive discussions between the services yielded a series of agreements, called the "31 Initiatives," which provided specific procedures for making AirLand Battle work. One joint proclamation announced that the A-10 needed to be replaced because the Army needed interdiction-style air support much more than CAS in this newly envisioned war. The Air Force announced a follow-on CAS plane study, but its leaders already strongly preferred using their new F-16 fighter for the mission. The fast little plane impressed everyone with

<sup>&</sup>lt;sup>1</sup>This author acknowledges that the chapter title matches the title of James Billington's fine history of the origins of Western revolutionary thinking, <u>Fire in the Minds</u> of Men: <u>Origins of the Revolutionary Faith</u> (New York: Basic Books, 1980).

its dogfighting prowess and bombing accuracy. Further, by the mid 1980s, the airmen knew that even the Reagan defense force expansion did not allow them to buy all their next generation fighting planes and still let them develop and procure a CAS plane. Since CAS was a low doctrinal priority, using an existing plane which could fly other missions and still meet the Army leadership's new warfighting plan seemed logical to the air leaders. In early 1987, the service announced that it would use F-16s for CAS.

The service's action seemed to guarantee a short operational life for the Warthog, but instead, it generated a heated controversy. The choice did not seem logical, given lessons learned in past and more recent wars. But the airmen insisted upon its validity, citing budgetary, doctrinal, and air defense threat influences. Arrayed against them were skeptics in their own and other services--as well as former members and sympathizers of the "Fighter Mafia" which had helped create the A-10. Some of the latter occupied various influential OSD positions, and they spurred OSD rejection of the Air Force's choice in 1986. To them, the F-16's petite appearance embodied the classic Air Force dismissal of CAS in favor of hot rod fighter planes to fly its more favored air superiority mission. OSD's Tactical Air Warfare Programs chief, Donald Fredericksen, oversaw a CAS review group formed to ensure that the service further studied the CAS plane issue.

A complex bureaucratic and political fight ensued which did not resolve itself until late 1990. But in the meantime, a hot public debate arose over the Air Force decision. At times it threatened to veer out of control, given the disparate views about CAS and the best way to accomplish it. One could best categorize the debate by focusing upon the two services involved and the opponents of the F-16 decision.

The Army leadership publicly endorsed the Air Force decision because of the 31 Initiatives agreement and its own doctrinal and budgetary concerns. Given the Air Force's bent for public relations, its leaders as well as other F-16 and interdiction advocates attempted to sell the decision via defense journal articles, academic works, and flight tests. The Army and the Air Force encountered surprising resistance both inside and outside their own ranks. This actually provided most of the grist of the debate, since it demonstrated that the two services' case was not airtight. Further, dissension heated emotions, and claims supporting CAS F-16 became more exaggerated, generating more criticism. The CAS F-16 opponents within OSD and elsewhere did not present a case as overwhelming as the Air Force case for the F-16. There were too many disparate views as to the best alternative, and some of the more questionable claims generated rebuttals from the Air Force side. The opponents' major contribution involved keeping skepticism about the Air Force's F-16 choice alive.

Indeed, the debate might be so much hot air, but the arguments highlighted questions about CAS and the dedicated CAS plane which had simmered for decades. It provided the more public indication of what the bureaucratic and political antagonists were thinking. Along with the less public maneuvering, it helped delay the Air Force's decision about retiring its dedicated CAS plane until other events could redeem it.

### Changes in Warfighting Doctrine

Even as the A-10 entered operational service, commentators criticized both it and the style of warfare they believed it represented. In 1979 and 1980, the Air Force's professional journal, <u>Air University Review</u>, featured articles by Royal Air Force (RAF) officers who disputed the efficiency of CAS while praising their own service's orientation toward interdiction missions. Group Captain Ian Madelin scoffed at the Americans' cumbersome CAS control procedures. Wing Commander Jeremy Saye did the same and also directly impugned the A-10's ability to fly CAS in a European war. At the same time, American military affairs experts Steven Canby and Edward Luttwak both decried what they argued was their nation's adherence to attrition warfare; and Canby cited CAS reliance as an example. All of these men believed that interdiction behind the lines potentially yielded greater returns for the risk of facing modern Soviet air defenses, and thus cited the RAF approach as the proper one.<sup>2</sup>

<sup>&</sup>lt;sup>2</sup>Steven Canby, Ph.D., "Tactical Air Power in Armored Warfare: The Divergence Within NATO," <u>AUR</u> 30 (May-June 1979): 2-20; Edward Luttwak, "The American Style of Warfare and the Military Balance," <u>AFM</u> 62 (August 1979): 86-88; Group Captain Ian Madelin, RAF, "The Emperor's Close Air Support," <u>AUR</u> 31 (November-December 1979): 82-86; and Wing Commander Jeremy Saye, RAF, "Close Air Support in Modern

These attacks spurred rebuttals within the same journal. American military officers reminded Madelin that America preferred firepower to losing lives. In certain situations, CAS would be the most important mission, and America had other warfighting theater concerns besides Europe. But the critics' articles reflected changes in warfighting ideas. Within NATO, the British insisted upon interdiction of forces near the battlefield as a legitimate alliance air mission. They saw it as a better use of their relatively scarce air resources, and within their North Germany operational area, it fit their practice of letting the ground commander assign air units to preempt reinforcing attacks. American air commanders in NATO opposed the British concept because by definition it interjected a ground officer into what the Americans believed was the air leader's decision-making turf. The difference manifested itself in haggling over the air support definition in the NATO warplan, Allied Tactical Publication (ATP) 27(B); but in 1980, the two sides compromised by breaking ATP 27(B)'s definition of air support into two sub-missions. CAS remained the support of engaged troops which required detailed control and coordination, while battlefield air interdiction (BAI) became the attack of enemy forces "which are in a position to directly affect friendly forces." NATO'S BAI definition kept the amount of coordination required intentionally fuzzy to satisfy both the Americans and British, but the big development was that air commanders recognized BAI as a separate air support activity.<sup>3</sup>

The NATO air support redefinition supported changes in Army doctrine underway in the late 1970s and early 1980s. No sooner had Active Defense formally appeared in 1976 than it endured increasing criticism from Army officers who believed that it promoted a defensive mindset and that it relied too much upon pure attrition to stop a Soviet attack.

Warfare," 31 AUR (January-February 1980): 2-21.

<sup>&</sup>lt;sup>3</sup>Davis, <u>31 Initiatives</u>, 30-31; and David Stein, "The Development of NATO Tactical Air Doctrine, 1970-1985," RAND Project AIR FORCE Report #R-3385-AF (Santa Monica, Calif.: RAND, December 1987), 8-13, 23-35.

For the rebuttals to Madelin, Canby, and company, see MAJ Price Bingham, USAF, MAJ Donald Roberts, USAF, and LTCOL Owen Wormser, USAF, "Fire, Counterfire," <u>AUR</u> 31 (March-April 1980): 59-73; and MGEN John Ralph, USAF, and others, "Commentary," <u>AUR</u> 31 (May-June 1980): 94-105 (this article featured the rebuttals to Madelin).

Further, Active Defense's emphasis upon committing all necessary forces to blunt what it considered the all-important initial Soviet attack created dissension. Some officers perceived it as a reckless abandonment of the time-honored practice of keeping a ready force reserve. Finally, there was the question of how to handle the massed Soviet follow-on units. One might stop the first assault only to be overrun or outmaneuvered in subsequent attacks.<sup>4</sup>

The leader of the growing doctrinal change movement was Active Defense founder General DePuy's successor as TRADOC commander, General Donn Starry. Starry had supported Active Defense and had participated in its development, but a 1976-1977 tour commanding the American V Corps in Germany brought home to him the problem of handling Soviet follow-on assaults. After assuming TRADOC command in 1977, Starry commenced a years-long development of a replacement doctrine, later called AirLand Battle, as he and others conducted studies and exercises to test their ideas. What they wanted was a more aggressive warfighting guide which emphasized four tenets: initiative, agility, depth, and synchronization. In actual warfighting terms, the Army aimed to use firepower and maneuver in the air and on land to disrupt the Soviets' attack tempo and eliminate their follow-on forces threat. The resulting fight would be a pell-mell affair with no traditional battle line; instead it would feature battles fought both along the traditional "front" as well as the rear areas of both sides.<sup>5</sup>

<sup>&</sup>lt;sup>4</sup>Romjue, <u>From Active Defense to AirLand Battle</u>, 15-25; and John Romjue, "The Evolution of AirLand Battle Concept," <u>AUR</u> 35 (May-June 1984): 7.

<sup>&</sup>lt;sup>5</sup>LTCOL Huba Wass de Czege, USA, "Army Doctrinal Reform," chap. in <u>The</u> <u>Defense Reform Debate: Issues and Analysis</u>, eds. Asa Clark, and others, (Baltimore, Md.: Johns Hopkins University Press, 1984), 101-119; Orr Kelly, <u>King of the Killing Zone</u> (New York: W.W. Norton, 1989), 230-241 (nice, simple summary of the doctrine's aims); Romjue, "Evolution of the AirLand Battle Concept," 6-11; and Romjue, <u>From Active</u> <u>Defense to AirLand Battle</u>, 24-33.

LTCOL de Czege was a staff officer heavily involved in AirLand Battle doctrine development. As of this writing, Romjue has been the TRADOC command historian since 1985. Their accounts detail the thinking and long process behind the new doctrine.

AirLand Battle's aggressiveness can also be seen in the fact that the Army expected to receive and tactically use nuclear weapons.

This was where the European push for interdiction eventually met with more sympathetic response from the American military than seen in some of the 1980 <u>Air</u> <u>University Review</u> articles. Though this was an Army doctrine, that service invited Air Force leaders to comment upon it as early as 1979. Through the Air Land Forces Application directorate (ALFA, mentioned earlier as an example of the 1970s interservice cooperation), the two services explored how best to attack the Soviets' reserves in a joint doctrinal effort known as Joint Attack on the Second Echelon (J-SAK). By the time NATO created the BAI sub-mission in ATP 27(B), the U.S. Air Force and Army were willing to accept it as part of their own redefinition of European warfighting.<sup>6</sup>

#### Associated Developments

Starry and TRADOC published the AirLand Battle doctrine in 1982. This coincided with other trends. A top Army doctrine scholar later observed that another reason for the poor reception of Active Defense versus AirLand Battle was that the AirLand Battle proponents generated support for it throughout its formulation. One key constituency was the growing military reform movement of the time. Upset with rising weapons costs and poor military performance in such fiascoes as the failed Iranian hostage rescue attempt, they demanded a more efficient and competent military. The reformers were never a formal group with sharply defined membership and aims. Instead, they were:

<sup>&</sup>lt;sup>6</sup>Creech, interview by author (emphasized that it was the Army's doctrine, though some joint TAC-TRADOC work did occur during its development); Davis, <u>31 Initiatives</u>, 29-31; Futrell, <u>Ideas</u>, vol. II, 546-554 (in his description of AirLand Battle and interdiction concerns, Futrell notes that it was an Army doctrine which assumed Air Force cooperation); Romjue, <u>From Active Defense to AirLand Battle</u>, 63-64; Russ, interview by author; and Winton, "Partnership and Tension," <u>Parameters</u>, 109-111.

AirLand Battle's publication stirred some controversy in NATO, due to differences between it and European objectives/warfighting methods. A new AirLand Battle doctrine in 1986 addressed some of these differences. See GEN William Richardson, USA, "FM [Field Manual] 100-5: The AirLand Battle in 1986," <u>Military Review</u> 66 (March 1986): 4-11 (Richardson was TRADOC commander when the new version came out). For the excruciating details of conflicting American and NATO terms and expectations in the older Airland Battle doctrine, see MAJ Henry Tuttle, USA, "Is AirLand Battle Compatible with NATO Doctrine?" <u>Military Review</u> 65 (December 1985): 4-11.

(a) a loose alliance of former "Fighter Mafia" types such as Tom Christie, Pierre Sprey and John Boyd (indeed, Boyd was considered by many to be the reform movement's intellectual leader); (b) OSD staffers such as Chuck Spinney, and again, Tom Christie; (c) journalists such as Dina Rasor, and James Fallows; (d) a bipartisan group of congressmen such as Senator Gary Hart (D-CO) and Representative Newt Gingrich (R-GA); and (e) those sympathetic to some of the reform movement's aims, such as OSD staffer Don Fredericksen. One could say that the entire reform movement actually fit in the latter category, since the group was so amorphous in composition and beliefs. But at least most of those calling themselves reformers hailed AirLand Battle as an example of how the American military could escape what they considered the wasteful American infatuation with attrition warfare.<sup>7</sup>

Rebuttals to the reformist critique can be found in Harold Brown, <u>Thinking About</u> <u>National Security: Defense and Foreign Policy in a Dangerous World</u> (Boulder, Colo.: Westview Press, 1983); Clark and others, eds., <u>Defense Reform Debate</u>; COL Trevor Dupuy, USA (ret., no relation to GEN DePuy), "Why Deep Strike Won't Work," <u>AFJI</u> 120 (January 1983): 56-57 (pungent critique from Army historian Dupuy, who observes that the Soviets would not idly accept a Western attempt to destroy their reserves); Kelly, <u>King of the Killing Zone</u>, 242-245 (critiques some of Rasor and Sprey's own criticisms of the M-1 Abrams tank); Kross, <u>Military Reform</u> (breaks down merits and deficiencies of reformers' beliefs); and Rebecca Strode, "Soviet Design Policy and Its Implications for U.S. Combat Aircraft Procurement," <u>AUR</u> 35 (January-February 1984): 46-61 (does not specifically mention the reformers, but attacks the reformist assumption that Soviet weapons are cheaper, simpler, and more reliable than American weapons).

<sup>&</sup>lt;sup>7</sup>The Army "doctrine scholar" is Romjue, in "Evolution," 8-9; and From Active <u>Defense</u>, 65-66. The reformers were prolific publishers---and publicists. LTCOL de Czege's article, "Army Doctrinal Reform," was in an essay anthology about military reform, and de Czege credited Fighter Mafia *and* military reform movement legend, retired Air Force COL John Boyd, for inspiring part of the new doctrine's concept. A sampling of the other military reform movement items consulted for this work, some previously cited, are: Jeffrey Barlow, ed., <u>Reforming the Military</u> (Washington, D.C.: The Heritage Foundation, 1981); Burton, <u>The Pentagon Wars</u>; Clark and others, eds., <u>The Defense Reform Debate</u>; Coates and Killian, <u>Heavy Losses</u>; Andrew Cockburn, <u>The Threat</u>: Inside the Soviet Military Machine; Thomas Etzold, <u>Defense or Delusion? America's Military in the 1980s</u> (New York: Harper & Row, 1982); Fallows, <u>National Defense</u>; Richard Gabriel, <u>Military Incompetence</u>: Why the American Military Doesn't Win (New York: Hill and Wang, 1985); Hadley, <u>Straw Giant</u>; Walter Isaacson, "The Winds of Reform," <u>Time</u>, 12-30; Rasor, ed., <u>More Bucks, Less Bang</u>; and Stevenson, <u>Pentagon Paradox</u>.

However, a military reform movement concern was President Ronald Reagan's high military expenditures. Many felt that the military misused the budgetary largesse, and one controversial weapon which received a reprieve after Reagan took office was the long-awaited successor to the ill-fated Cheyenne, the Army Advanced Attack Helicopter (AAH). Developmental work began as soon as the Army cancelled Cheyenne in the early 1970s, and in 1976, Hughes Aircraft Company's AH-64 Apache (for photo, see Appendix Fig. 44) won the competitive prototype flyoff over Bell Helicopter Company's AH-63. The winning design was not as ambitious as the Cheyenne, but it was grand enough. Inflation and developmental problems drove its prototype cost above six million dollars per copy, and led Congress and President Jimmy Carter's administration to cut program spending in half. The Apache staggered through a negative GAO report, a test mishap, and attacks from Congress and the Carter administration, but it finally received full production approval in 1982.<sup>8</sup>

The end result was a helicopter that cost even more than earlier. And while the Apache could not fly as fast or do dive bomb runs like the Cheyenne, it still offered various impressive attributes. Hughes built in as many survivability features as it could for a helicopter: a dual flight control system and certain parts which could operate without lubrication oil for a specified time. It also carried the latest radar threat warning and countermeasures gear. Most costly and noteworthy were its avionics and fire control features. It did not have a terrain-following radar like the Cheyenne, but it did have sophisticated navigation and night-vision systems, the latter of which were integrated into the crew's helmet visors. As such, it possessed at least a night low level capability. The Apache carried up to sixteen Hellfire antitank guided missiles, as well as rockets and a 30

<sup>&</sup>lt;sup>8</sup>Bradin, "Birth of a Brave," chap. in his <u>From Hot Air to Hellfire</u>, 133-156 (developmental account and cost figures); and Gunston, <u>AH-64 Apache</u>, 5-8.

Bradin writes that at one point in the early 1980s--before an angry Congress forced a contract re-negotiation--Apaches cost thirteen million dollars per copy (155). He also reveals the latent friction between some Army attack helicopter types and the Air Force A-10, which they perceive as competition. On page 150, he describes Carter's Defense Secretary Harold Brown thus: "former secretary of the air force and godfather of the A-10 Warthog, [who] cut the AAH funds by one-half."
mm chain-driven gun. The Hellfire still required someone to designate the target while that missile flew toward it, but its range of over four miles--nearly twice that of the TOW--allowed it some stand-off capability. Also, the Apache could either guide a Hellfire with its own laser designator or allow someone at a less exposed location to guide it. As for the chain gun, its muzzle velocity was roughly half that of the GAU-8A, and its complex construction would produce many operational difficulties.<sup>9</sup>

The Apache remained a villain in the military reform lexicon; reformer journalist Gregg Easterbrook certainly did not praise it in his September 1981 <u>Washington Monthly</u> article, "All Aboard Air Oblivion." But its advanced firepower technology reflected another aspect of the Army's doctrinal change: confidence in its own troops and weapons to halt attacking Soviet units at the point of contact. Other powerful weapons, such as the M-1 Abrams tank and the Multiple Launch Rocket System (MLRS), were becoming operational; and like the Apache, their sophisticated fire control systems enhanced their lethality. General Starry's attitude was an example. In the late 1970s, he defended fixed-wing CAS against skeptical Europeans and critics such as Steven Canby. However, as far back as 1975 he anticipated something better for his own forces when he sent a

<sup>&</sup>lt;sup>9</sup>Bradin, 146; Frank Conahan, U.S. Assistant Comptroller General, <u>Apache Was</u> <u>Considered Effective in Combat but Reliability Problems Exist</u>, GAO/NSIAD-92-146, (Washington, D.C.: GPO, 20 April 1992), 17; E.J. Everett-Heath, "The Development of Helicopter Air-to-Ground Weapons," <u>IDR</u> 16 (March 1983): 326; Bill Gunston, "Harrier II," chap. in <u>Great Book of Modern Warplanes</u>, Bonds, et al, eds., 384; Gunston, "Technical Features," and "Apache Weapons," chaps. in his <u>AH-64 Apache</u>, 9-40; Nick Lappos, "Guns in Helicopters: Will Existing Systems Do?" <u>Interavia</u> (April 1986): 397; MAJ Randy Nelson, USA, "The Combat Use of Apache Helicopters in the Kuwaiti Theater of Operations-Effective or Not?" (Master's thesis, U.S. Army Command and General Staff College, 1992), 6-33, 63; and Stolfi, interview by author.

At least as of this writing, the Hellfire's range is classified, but Everett-Heath puts it at over 6000 meters, and Nelson claims that it is "more than 3.7 miles" (12). Bradin writes that the chain gun used the Aden 30 mm round, which Stolfi said lacked the mass and velocity to be effective against armor. Nelson describes the gun as an "area weapon primarily used to provide suppressive fire" (14) against lightly armored vehicles. Gunston puts the Aden gun's muzzle velocity at 790 meters/second ("Harrier II"), which matches Lappos' reported Apache chain gun muzzle velocity of 2659 feet/second. Both GAO and Nelson note the chain gun's reliability problems during Desert Storm.

message entitled "Who Plays What in the Symphony" to then-TRADOC commander DePuy. In it, he sardonically commented upon a visit by "some hucksters from Fairchild" who touted the A-10's antitank capability. Citing studies predicting American ground units' ability to stop comparable Soviet armored outfits, he preferred that the Air Force keep the Soviet airmen off his back and hit all the other available targets--especially those units in reserve. The A-10's antitank features were beneficial, and may be necessary for CAS. However, the Army commander might want the plane for other things if his soldiers already possessed ample antitank weaponry. In this regard, Starry concluded:

If I were conducting the symphony it would be most disconcerting to come to the part of the 1812 Overture where the guns are sounding, raise my baton to the drums only to find that a violin salesman passing through had persuaded the equipment manager that he had a bunch of fiddles that did exactly what the drums did and so sold a bunch. And so instead of a thundering finale all we could manage was a few squeaky wails at the end.<sup>10</sup>

<sup>10</sup>Quotes are from MGEN Starry, USA, "Who Plays What in the Symphony," personal message to GEN DePuy, USA, DTG 251220Z Sep 75, copy in author's possession. Starry's defense of CAS is from GEN Starry letter to ALFA and GEN Starry letter to Steven Canby. In both letters, he writes that he is aware of what other air forces do, but he must have CAS to fight outnumbered in Europe and win. Starry's "symphony" message does not quite jibe with the later letters, but it very much reflects the underlying premise of AirLand Battle. It may also have reflected concern that too much reliance upon the A-10 would deny the Army needed firepower--whether in budgetary or real battles.

Other indications of Army confidence are in Don Fredericksen testimony in Congress, House, Hearings before the Committee on Armed Services, <u>National Defense</u> <u>Authorization Act for Fiscal Year 1989–H.R. 4264 and Oversight of Previously</u> <u>Authorized Programs, Title I</u>, 100th Cong., 2d sess., 9 March 1988, 290-291; David Fulghum, "Doubts Cast on AF Role," Defense Trends special section, <u>Air Force Times</u>, 25 September 1989, 2; GEN William Richardson, USA (ret.), personal interview by author, 9 May 1997, Washington, D.C., notes in author's possession (Starry's successor as TRADOC commander); GEN John Wickham, USA (ret.), telephonic interview by author, recording and notes in author's possession (Army Chief of Staff in the early 1980s). Both of the above generals emphasized that the new doctrine mostly emphasized offensive spirit to disrupt and destroy Soviet reserves, but both conceded that it implied that American forces could defeat Soviets in direct clashes.

Easterbrook's <u>Washington Monthly</u> article is reprinted in <u>More Bucks</u>, Less Bang, ed., Rasor, 50-66 (page references are to reprint).

If the Apache did not inspire confidence among reformers like it did with the Army, the early 1980s witnessed the Air Force operational debut of a fighter which was a reformer success story. The petite F-16 (for photos, see Appendix Figs. 45-46) represented the reformer emphasis upon less expensive, less complex, but nonetheless effective weapons. In fact, the Fighter Mafia was largely responsible for its creation. Air Force and OSD staffers who detested what they considered the military's predilection for large, expensive, and complex air-to-air fighters wanted an inexpensive plane dedicated to dogfighting superiority. The Air Force preferred more F-15s, but this group successfully ramrodded their project, entitled the Lightweight Fighter, through the defense procurement maze. Indeed, one success milestone was the 1974 Schlesinger-Brown agreement, which not only helped the A-10 achieve operational status but also made the Air Force accept the Lightweight Fighter. General Dynamics Corporation's F-16 beat Northrop YF-17 in a flyoff competition in 1975.<sup>11</sup>

The Air Force may have had some initial doubts, but in the 1970s several NATO countries as well as Israel bought the F-16, whose initial cost per plane was a relatively cheap ten million dollars. When it became operational, General Dynamics' bantam fighter amply returned these air forces' investment. In 1981, Israeli F-16s successfully bombed the Iraqis' Osirak reactor in Baghdad. Then, during the 1982 "Peace for Gallilee" Lebanon incursion, F-16s were the top MiG killers. The U.S. Air Force's first operational F-16

<sup>&</sup>lt;sup>11</sup>Accounts of the Fighter Mafia and the F-16 are in Dörfer, <u>Arms Deal</u>, 3-28; and Stevenson, <u>Pentagon Paradox</u> (nearly half of the book, 200 pages, introduces the major Fighter Mafia players, describes their Lightweight Fighter efforts, and recounts the F-16's development and flyoff success). F-16 development history, and some Fighter Mafia discussion, are in Richard Hallion, <u>Storm Over Iraq</u> (Washington, D.C.: Smithsonian Institute Press, 1992), 41-42 (Hallion is a great F-16 supporter); Doug Richardson, <u>Modern Fighting Aircraft; F-16 Fighting Falcon</u> (New York: Arco, 1983), 4-17.

Though many people contribute to any plane's creation, the accounts praise efforts of the following Fighter Mafia players in the Lightweight Fighter saga: John Boyd, Tom Christie, Chuck Myers, Everest Riccioni, and Pierre Sprey.

Reformer enthusiasm for the F-16 can be seen in Fallows, <u>National Defense</u>, 95-106 (also an account of Fighter Mafia efforts); and Fred Kaplan, "The Little Plane that Could Fly, If the Air Force Would Let It," <u>The Boston Globe</u>, 14 March 1982, reprinted in <u>More Bucks, Less Bang</u>, ed. Rasor, 186-190 (page references are to reprint).

wing--the 388th from Hill AFB, Utah--scored a spectacular victory over dedicated interdiction planes in the 1981 RAF tactical bombing competition. The initial F-16 units enjoyed remarkable maintenance reliability as well. With its sophisticated flight control system, high thrust-to-aircraft-weight ratio, and advanced bombing/air combat fire control system, the F-16 could dogfight better and bomb more accurately than nearly any other fighter. Thus it seemed to be the multirole fighter that fighter airmen had so long sought; and though other aircraft purchases continued on a yearly basis, the now-enthusiastic Air Force bought F-16s via a multiyear production plan. Further, the service envisioned purchases through the end of the 1980s, with staged modifications to incorporate ever more sophisticated fire control and navigation avionics--and ever more diverse missions.<sup>12</sup>

This had ominous implications for the A-10. In 1982, Air Force leaders decided that the preplanned amount of just over seven hundred A-10s would be enough. In an early 1982 congressional budget hearing, Air Force Chief of Staff Lew Allen told the legislators that the A-10 was "an excellent weapon," but that the force requirements for this specialized CAS plane had been met. Congressional response was mixed. In a March 1982 hearing Air Force Director of Operational Requirements, Major General Robert Russ reiterated Allen's comments to Senator Barry Goldwater, adding that any potential A-10 procurement money could best be used to buy F-15s and F-16s. Goldwater replied:

I think you have all you need. I know what you are up against. You have the parochial problem of Massachusetts, New York, Pennsylvania, and

<sup>&</sup>lt;sup>12</sup>Burton, <u>Pentagon Wars</u>, 100-102 (claims that some Air Force leaders fought purchasing more F-16s even through 1980, but once the service committed to the plane, it ruined it by adding too many features); Futrell, <u>Ideas. vol. II</u>, 562-562; Hallion, <u>Storm</u> <u>Over Iraq</u>, 43; Richardson, <u>F-16 Fighting Falcon</u>, 10-17 (cost data, 12), 48-54; and Susan Young and John Taylor, "Gallery of USAF Weapons," <u>AFM</u> 65 (May 1982): 155-156 (even at this time, the service planned to "expand the single-seater's multi-role flexibility to perform precision strike, night attack, and beyond-visual range interception missions" [155] by incorporating the best radar air-to-air missile night vision equipment).

The cost issue was the same as with the A-10. In 1979, the plane cost \$10 million, but allowances for inflation set the cost as \$4.7 million for the year the contract was let, 1975. As such, the service asserted that the plane met its \$5 million maximum price goal.

Air Force attitudes toward the F-16 actually were changing by the late 1970s, as Futrell's quotes of some enthusiastic generals attest.

Maryland, all wanting to keep that A-10 going just like they bought A-7s to keep Texas happy .... They will be mad at me, but they are mad at me anyway ... I don't think you need any more A-10's.

Perhaps Goldwater was trying to boost Major General Russ' spirits, because five days prior, the general faced New York and Maryland lawmakers who tested the Air Force rationale. Congressman Sam Stratton (D-NY) wondered why, if Russ said that the A-10 was still important, the service did not want any more. Stratton also noted that the A-10 existed because the Air Force did not have such a plane in Vietnam. Congresswoman Beverly Byron (D-MD) pressed Russ on what plane would replace the A-10 as it aged and its numbers dwindled over the years. Russ replied, "We will use the other planes, the F-16's, that are dually capable." The general explained that he wanted a mixed force of dedicated and multirole planes for CAS, and assured Byron that the F-16 could carry "all the weapons the A-10 can carry." "And still gets off the ground?" quipped Byron, who apparently had seen the small fighter. But Russ was insistent against the Maryland and New York skeptics. He told them that A-10 would be around for a long time--through the 1990s--and if someone delivered a suitable follow-on dedicated CAS plane design, he would surely look at it. In the meantime, the F-16 would slowly assume the A-10's role.<sup>13</sup>

<sup>&</sup>lt;sup>13</sup>Allen testimony is from Congress, Senate, Hearings before a Subcommittee of the Committee on Appropriations, <u>DoD Appropriations for Fiscal Year 1983</u>, 97th Cong., 2d sess., quoted in Futrell, <u>Ideas</u>, vol. II, 561 (page reference is to Futrell). Other testimony is from Congress, House, Hearings before the Committee on Armed Services, <u>Military</u> <u>Posture and H.R. 5968</u>, <u>DoD Authorization for Appropriations for Fiscal Year 1983</u>, Part <u>3</u>, 97th Cong., 2d sess., 11 March 1982, 470-475 (Russ exchange with Maryland and New York legislators, quotes, 472-473); and Congress, Senate, Hearings before the Committee on Armed Services, <u>DoD Authorization for Appropriations for Fiscal Year 1983</u>, Part <u>4</u>, 97th Cong., 2d sess., 16 March 1982, 2595-2596 (Goldwater-Russ exchange quote 2595).

Sweetman, <u>A-10</u>, 46-47, specifically cites the F-16 as the "A-10's real problem" (46). He notes that the plane's versatility made it the foreign air forces' choice of American air weaponry, as well as the U.S. Air Force's preference to complement the A-10 in CAS. Interestingly, Sweetman wrote this in 1984, a full two years before the CAS plane controversy erupted.

The effort to keep the A-10 in production was a feature of <u>Time</u> magazine's "Winds of Reform" article about the Reformers, and GEN Russ mentioned it in his interview. Russ recalled that, in 1981, Fairchild told some congressmen that additional A-10 buys would be cheaper per plane; and that same year Senator Goldwater sharply

The Russ testimony revealed the thinking of two Air Force officers whose positions and decisions helped guide their service's approach to CAS through the 1980s decade. From his position as Air Force Director of Operational Requirements, Major General Robert Russ affected future procurement decisions, and as TAC commander from 1985 through 1990, he would exert even more influence. Likewise, Lieutenant General Larry Welch took over the Air Force Deputy Chief of Staff for Programs position in 1983, and was Air Force Chief of Staff from 1986 to 1990. Through the early 1980s, both generals worked together on a plan for the future tactical air force's makeup, known as the "Fighter Roadmap." Their Roadmap did not include more A-10s. The believed that service had enough dedicated CAS planes, and Russ later recalled that the Night/All Weather two-seat A-10 did not seem worthwhile. Both leaders envisioned making the A-10 a Forward Air Control (FAC) plane, where it could switch roles between coordinating CAS missions and doing them itself. Consultations with Army leaders about F-16s flying CAS missions produced no objection as long as the Air Force provided CAS upon demand. Welch later said that the idea for an "A-16" arose during this time, but in a preview of the upcoming fight over Air Force CAS planes, he encountered opposition. OSD staffers wanted a new CAS plane, not an F-16 for CAS. Welch perceived that the argument involved differing opinions of optimum CAS plane design. The opponents wanted a rugged plane which was slow and maneuverable enough to find and hit targets-in other words, a plane which incorporated the A-10's strengths. Pursuant to his belief in speed as a necessity to avoid hits and survive in combat, Welch wanted the F-16 for CAS. He set up an F-16 bombing

questioned Air Force leaders about why they did not want to buy more such planes. By 1982, Goldwater knew that the reverse was true. Author Isaacson noted the Air Force's traditional aversion to CAS, and the Army's rival air support force of helicopters. Calling the A-10 "a good close air support plane," Isaacson then recounted the Air Force's recent termination of A-10 procurement in favor of the F-16, as well as an ensuing congressional fight between A-10 and F-16 backers. A Congress-Reagan Administration pork barrel agreement yielded a compromise buy of twenty more A-10s. Such a small purchase given the infrastructure costs involved raised these A-10s' per unit cost from six million dollars to eighteen million dollars. See, Isaacson, 16; and Russ, interview by author.

demonstration for Air Force Secretary Verne Orr that demonstrated that it at least had the necessary weapons accuracy.<sup>14</sup>

Russ and Welch were not two maverick senior staffers perpetrating an unsanctioned scheme. The J-SAK studies demonstrated that both services wanted more emphasis upon interdiction, a mission which better suited the F-16. Indeed, a later congressional hearing on the topic revealed that the "Air Force began analysis and documentation of A-10 deficiencies to support the new Army doctrine shortly after AirLand Battle was published." This dismissal of the A-10 was an ironic effect of the interservice cooperation on AirLand Battle, which a 1984 interservice staff discussion on implementing AirLand Battle further illustrated. The Air Force and Army Chiefs of Staff, General Charles Gabriel and General John Wickham, oversaw this dialogue and endorsed its ensuing resolutions, called the "31 Initiatives." These accords not only affirmed the Air Force's fixed-wing CAS obligation, but also contained a pledge to develop procedures for "close air support (CAS) in the rear area," as one historian of this effort put it. Another initiative promised coordination to ensure that Air Force fixed-wing and Army rotary-wing air support aircraft capabilities did not overlap. Both services' leaders preferred

<sup>&</sup>lt;sup>14</sup>GEN Adams, interview by author (Adams served as TAC Director of Requirements in 1984-1986, and he confirmed the Fighter Roadmap plans for the A-10); Burton, <u>Pentagon Wars</u>, 57-60, 61, 68, 99-101; Orr, interview by author; GEN Russ, interview by author; and GEN Welch, interview by author.

Orr did not specifically mention Welch's actions, but he did say that when he became Air Force Secretary, he noticed little enthusiasm for the A-10 because the airmen believed that modern air defenses were too tough for it. He also said that he supported the CAS F-16 from the start, though Welch recalled some initial skepticism on Orr's part.

Russ said that the N/AW two-seat A-10 would have been dedicated to that mission, and since N/AW CAS at that time was still an uncertain proposition, it did not seem a worthwhile investment. There was some congressional support for a N/AW A-10, but he observed: "As you know, you've got support [in Congress] to buy any airplane . . . . but that money comes from somewhere, and it's not a matter of them adding the money, it's a matter of it coming from somewhere else."

interdiction---and the fast, sophisticated fighters that flew it---as the optimum means of fixed-wing air support.<sup>15</sup>

Through late 1984 and early 1985, the Air Force conducted an informal study of CAS plane alternatives, to include modifying the A-10 as well as examining four other manufacturers' follow-on CAS plane designs. The study concluded that though the issue needed further study, an unmodified A-10 would not be viable past the mid 1990s, and that a modified F-16 seemed a likely candidate. To the service, the key factors driving a CAS plane decision were cost, time, and survivability. As General Russ said then and later, the budget picture did not allow for a completely new CAS plane and all the other tactical aircraft purchases required by his Fighter Roadmap. Air Force leaders also remembered the lengthy development times for new planes, and they believed that their service could not procure a new CAS plane to serve the AirLand Battle warfighting scheme soon enough. Finally, the service simply rejected the A-10 as unsuitable for the interdiction mission, given the European-style threats that it thought the plane would face. "We need a faster, more maneuverable aircraft. The A-10 will be vulnerable," one Air Force staffer publicly stated at the time. Thus, after publishing the 31 Initiatives, the

<sup>&</sup>lt;sup>15</sup>Davis, <u>31 Initiatives</u>, 30-61 (quote from the "one historian," 53); Harry Finley, Senior Associate Director, GAO, <u>Close Air Support: Status of the Air Force's Efforts to</u> <u>Replace the A-10</u>, GAO/NSIAD-88-211, (Washington, D.C: Government Printing Office [GPO], 1988), 14-16 (describes evolution of CAS plane issue); Hallion, <u>Storm Over Iraq</u>, 74-81 (general laudatory account); and Loren Larson, Office of the Deputy Under Secretary for Tactical Air Warfare Programs, cited in Congress, House, Hearings before the Committee on Armed Services, <u>National Defense Authorization Act for FY</u>. <u>1989--H.R. 4264 and Oversight of Previously Authorized Programs</u>, 100th Cong. 2d sess., 10 March 1988, 308-311 ("analysis" quote, 311); and Wickham, interview by author (recalled that one staff proposal was that the Army assume responsibility for CAS, which both he and his Air Force counterparts snuffed).

Davis' work is a good history of Air Force-Army support relations, as evidenced by its frequent citation in this work; and of course is the best single-source reference for these resolutions.

Russ and Welch did not originate the A-10 FAC idea either. It had at least appeared in a 1978 staff college research paper. See MAJ Glenn Profitt, USAF, "The FAC: A New Concept" (Research program paper, Armed Forces Staff College, 1978).

service chiefs issued a Memorandum of Agreement in April 1985 requesting a new close air support aircraft which was:

capable of executing the close air support mission on the non-linear battlefield across a broad spectrum of combat scenarios and threats ranging from the friendly rear area to the traditional battle area and the deep maneuver area.

The Memorandum specified that the design "also provide for the inherent capabilities needed for air interdiction"; and it also stated that the "timely fielding of a follow-on CAS aircraft dictates that the A-X program focus on existing airframes available for procurement in the late 1980s."<sup>16</sup>

Immediately after publishing the Memorandum, the Air Force formally issued a Request for Information (RFI) to industry to determine once again if there were any other designs, but its leaders' hearts seemed set upon the F-16. In fact, even as the Air Force did its earlier, informal study, industry leaders expressed skepticism about the service's seriousness. The only respondents were companies with already-available fighter and attack planes: General Dynamics' F-16, LTV's A-7, McDonnell-Douglas' AV-8, and Northrop's F-20. (The service's rush to judgment also stemmed from Verne Orr's desire for a quick resolution. Orr wanted to demonstrate the Air Force's air support dedication and thus head off any interservice roles-and-missions fight.) In July 1985, it submitted a

<sup>&</sup>lt;sup>16</sup>Finley, <u>Replace the A-10</u>, GAO, 19-20 (describes Air Force study and decisions); Donald Fredericksen, Deputy Under Secretary of Defense for Tactical Warfare Programs, testimony in Congress, Senate, Hearings before the Committee on Armed Services, DoD Authorizations for Appropriation for FY 1989, Part 4, 100th Cong., 2d sess., 21 March 1988, 48 (also cites budget considerations for move); GEN Charles Gabriel, Air Force Chief of Staff, John Marsh, Secretary of the Army, Verne Orr, Secretary of the Air Force, and GEN John Wickham, Army Chief of Staff, "Memorandum of Agreement on Follow-On Close Air Support Aircraft," 8 April 1985, reproduced in Davis, 31 Initiatives, Appendix 13, 153-154 (Memorandum quotes, 154); Brendan Greeley, Jr., "USAF Reviewing Contractor Proposals for Attack Aircraft," AW&ST 123 (22 July 1985): 16-18 (staffer quote, 16); Robert Ropelewski, "Affordability to Take Priority in USAF Advanced Fighter Design," AW&ST 123 (23 September 1985): 14-16 (Russ cites budget constraints, looks at modified A-7); Robert Ropelewski, "USAF Seeks Fighter Derivative as A-10, A-7 Replacement," AW&ST 122 (4 March 1985): 14-15 (this pre-Memorandum article reveals the Air Force's intentions); and the following interviews by author: Orr (did not specifically mention his concerns), Russ, and Welch.

Justification for Major System, New Start (JMSNS) for the new plane, but OSD rejected it for restricting CAS plane options. In fact, the service omitted new CAS plane funding from its FY 1987 force posture statement; and it allocated no money for one in its FY 1988 budget plan. Meanwhile, Air Force officers published the occasional article claiming that AirLand Battle meant a more interdiction-oriented air support. Finally, in early 1987, now-TAC commander Russ announced that the Air Force's CAS plane would be a modified F-16. He added that A-10s would transition to FAC units.<sup>17</sup>

# Initial Results and Implications of Air Force-Army Actions

The Air Force's actions did not occur in a vacuum. As the months passed after the interservice Memorandum of Agreement, the service encountered increasing resistance in

Northrop's F-20 Tigershark was an enhancement of the F-5 design. However, it was primarily an air-to-air fighter, and was soon rejected. It achieved some fame as a low-cost competitor to the F-16 for foreign military sales, but the Reagan administration's decision to allow friendly, non-NATO, nations to buy F-16s—and General Dynamics' reduction of the F-16's price—meant that no one bought F-20s (Orr, interview by author).

In his "Affordability" article, Ropelewski mentions that some people thought that the push for a new CAS plane was due solely to Orr.

In his discussion of AirLand Battle's implications for air support, ALFA staffer Machos ironically observes that the A-10 could perhaps flourish in battlefield interdiction missions where the air defenses were not so densely packed.

<sup>&</sup>lt;sup>17</sup>Millard Barger, "What the Air Force Has to Do to Put the 'Air' in AirLand Battle," AFJI 124 (June 1986): 64 (wonders at the Air Force's seriousness about CAS, especially when an informal meeting with Air Force Pentagon staffers reveals their belief that traditional CAS was a "myopic" view of warfighting; posture statement is on 64); Dan Beyers, "Russ' Support of F-16 Revamp Over New Ground Support Plane Shocks AFA," Defense News, 2 February 1987, 4; Greeley, "USAF Reviewing Contractor Proposals," 16-18 (staffer quote, 16); MAJ James Machos, USAF, "Air-Land Battles or AirLand Battle," Military Review 63 (July 1983): 33-40; LTGEN Merrill McPeak, USAF, "Tacair Missions and the Fire Support Coordination Line," Air University Review 36 (September-October 1986): 65-72 (discusses AirLand Battle implications for air support); Orr. interview by author; MAJ Pat "Doc" Pentland, USAF, "Close Air Support-A Warfighting View," AFJI 126 (September 1988): 94-95 (FY 1988 budget plan); Ropelewski, "Affordability to Take Priority," 14-16 (Russ looks at modified A-7; Orr's concerns); Ropelewski, "USAF Seeks Fighter Derivative," 14-15 (industry skepticism, Orr's concerns); Russ, interview by author; Sweetman, A-10, 46-47; and "USAF Plans to Introduce A-10s into Forward Air Control Fleet," AW&ST 126 (9 February 1987): 23.

both the defense press and in OSD. Some of the opponents were old Fighter Mafia hands or reformers; indeed, at least one reformer considered the A-10 a "symbol of the Reform Movement." In the late 1970s, some of them answered Air Force preliminary plans for an expensive fighter-bomber with their "Blitzfighter," a CAS plane smaller, simpler, and even cheaper than the A-10; they proposed such a plane as an A-10 replacement in the early 1980s. Obviously, the Air Force's choice of an increasingly sophisticated fighter for CAS upset them. Key players were Donald Fredericksen, who became Deputy Under Secretary of Defense for Tactical Air Warfare Programs in 1985; Tom Christie, who was Director of Program Integration; and Chuck Spinney, who worked in the Program Analysis and Evaluation Office. Their positions may not have seemed like much, but they were all well placed to affect the Air Force's procurement efforts, especially Fredericksen. They also had friends and connections. Pierre Sprey was not in OSD, but gave advice. Military reformers in the press and in Congress also helped.<sup>18</sup>

The year 1986 witnessed continued friction between OSD--particularly Fredericksen's Tactical Air Warfare Programs Office--and the Air Force, as both sides stuck to their positions amidst a flurry of staff studies (these were the advance gust of an upcoming avalanche). Fredericksen later said that, during this time, industry gave him affordable design alternatives which convinced him that the Air Force was not trying hard enough. In summer, the Air Force proposed a mixed force of modified A-7s and F-16s; and though OSD allowed studies to continue on the modified A-7, it rejected the F-16

<sup>&</sup>lt;sup>18</sup>James Blackwell, "American Close Air Support--The Next Model," <u>NATO'S 16</u> <u>Nations</u> (December 1988-January 1989): 59 (nice summary of Air Force CAS plane history and 1980s follow-on CAS plane controversy; cites influence of congressmen and well-placed Reformers ); Burton, <u>Pentagon Wars</u>, 57-60, 61, 68, 99-101, 242 ("symbol" quote); and Christie, Fredericksen, and Spinney, interviews by author

Burton is the Blitzfighter source, and it is unclear from the interviews if all of the reformers favored the Blitzfighter design, though Christie and Spinney both described follow-on CAS plane efforts in the early 1980s. To Christie, Air Force leaders seemed wary of an OSD CAS plane initiative because it reminded them of Sprey and others' efforts for the A-10: "We were constantly raising the issue that you need a follow-on [CAS] airplane. Well, again, all of this, in the eyes of the Air Force, was reminiscent of what they had gone through in the sixties. You know, 'Here we are back again, same office, same people.' It was like, 'Here we go again. We've got to stop this.'"

outright. That December, an angry meeting between Air Force and OSD representatives in Deputy Secretary of Defense William Taft IV's office helped produce an OSD directive to create an oversight committee to ensure that the Air Force studied other CAS plane candidates besides the F-16. Don Fredericksen was to chair the assemblage, called the Close Air Support Mission Area Review Group (CASMARG). Up to this point, the friction between the two sides simmered without much open rancor, but CASMARG's formation and General Russ' public endorsement of the F-16 CAS plane shortly thereafter brought it to a full public boil.<sup>19</sup>

### Clashing Backgrounds, Clashing History

In 1986, as the debate smoldered with occasional public flashes, retired Army Brigadier General E.M. Lynch observed in an article that the dispute's subject, CAS, was

Christie called the 1986 infighting a "major shootout." He recalled that the December meeting featured an Air Force Lieutenant General, future Chief of Staff Merrill McPeak, and an unidentified Major General. McPeak cited budgetary constraints as a reason for choosing the F-16, but could not respond when Taft told him that OSD would at least fund a follow-on CAS plane prototype. Christie said that the fact that the Air Force only sent a Lieutenant General signalled to the others that it was not serious. Spinney said that he authored one of the studies, which pushed for a new CAS plane; he also claimed that Pierre Sprey suggested the CASMARG idea.

Both Fredericksen and Pentland said that the Air Force committed to the F-16 in spring 1986. (Pentland was an Air Force Pentagon staffer in the late 1980s who dealt with the CAS plane issue, and writes that the Air Force did not include money for a new CAS plane because OSD had rejected its initial proposal.) To this author, these men's assertions, though sincere, do not square with the leadership's intentions. General Russ' 1982 congressional testimony, Russ and Welch's interview commentary, Sweetman's 1984 book, Larson's 1988 congressional testimony, Ropelewski's March 1985 <u>AW&ST</u> article, and McPeak's "reticence" about follow-on CAS planes in the December 1986 OSD meeting, all indicate that the Air Force knew what it wanted early on. OSD's 1985 rejection of the service's proposal would have been a clear signal that it wanted some effort for a new plane, and the service could have heeded it.

<sup>&</sup>lt;sup>19</sup>"Battle Brews Over Follow-On Close Air Support Aircraft," <u>AW&ST</u> 126 (2 February 1987): 19; Blackwell, "American Close Air Support," 59; Congress, House, <u>National Defense Authorization Act for FY 1989--H.R. 4264</u>, 252 (Fredericksen discusses contractor suggestions), 310-312; Finley, <u>Replace the A-10</u>, GAO, 19-20; Pentland, "Close Air Support--A Warfighting View," 94-95; Sweetman, <u>A-10</u>, 46-47; and Christie, Fredericksen (also discussed contractor initiatives), and Spinney, interviews by author.

different things to different beholders. The two sides in this case exemplified the good general's point, as they both followed their own experience. The Air Force leaders' perspective on warfighting and budget imperatives guided their choice of the F-16. From Army Air Force days onward, fighter pilots prized speed in combat, and the new fighter pilot leaders like Welch were no exception. One could say that just as the bomber generals dogmatically emphasized nuclear strategic bombing, so the fighter pilots had their pet warfighting priorities. As the debate developed, General Russ and other Air Force officers repeatedly asserted that speed would keep the F-16 from suffering hits on the battlefield, though it certainly did not do so for fast planes in Korea and Vietnam. A defense press reporter, Brendan Greeley, Jr., noted that they valued aircraft speed as the answer to all air defense problems. He called it the "knots tactic," and wrote that they rejected the A-10 while still regarding the F-105-the same F-105 which was at best an adequate conventional attack plane in Vietnam-as the air-to-ground fighter standard. However, like Air Force leaders of decades past, the air leaders persistently viewed conflicts like Vietnam and Korea as anomalies. Instead, they ever anticipated the big smashup with the Russians in Germany as something so completely different that previous lessons about CAS would be irrelevant. Finally, the fighter men historically preferred accomplishing the air superiority, interdiction, and CAS missions with the same multirole plane. And in the F-16, they saw the arrival of the multirole fighter so sought after by earlier generations. Indeed, one proclaimed that "We are back to an airplane that can do it all." Of course, CAS would be the third priority in training and interest for these multimission aviators, and that did not escape critics' notice. Defense writer Millard Barger observed: "A glance at history suggests that the US Air Force needed no prodding from the Army or its doctrine to pursue the counter-air and air interdiction roles with enthusiasm."<sup>20</sup>

<sup>&</sup>lt;sup>20</sup>Barger and Greeley quotes are from Barger, "What the Air Force Has to Do," 58; and Greeley, "USAF Reviewing Contractor Proposals," 17. Lynch's observation is from his "Close Air Support: Its Failed Form and Its Failing Function," <u>AFJI</u> 124 (August 1986): 72-78.

Examples of belief in speed and view that Vietnam and Korea were not representative wars are: LTCOL Price Bingham, USAF, "Air Power and the Close-In Battle: The Need for Doctrinal Change," in <u>Proceedings, Symposium: Air Support</u>, 5-49

The air leaders also understood that the budget historically dictated force structure and impelled special attention to traditional doctrinal priorities. Indeed, Welch was Chief of Staff when the Reagan administration's military buildup ended, forcing hard "either-or" choices. In these, he was a man of his service and its history. As the CAS plane debate later intensified, he bluntly specified at an Air Force Association (AFA) gathering that he would sacrifice none of his higher priority aircraft and weapons projects--these included a new fighter, a new bomber, a new transport, and a new air-to-air missile--in order to spend money on a new, dedicated CAS plane. General Russ wanted to continue his plan for making the A-10 a FAC plane which could switch to an attack role when needed, but both it and other parts of his Fighter Roadmap fell victim to the late 1980s budget cuts. In an interview years after his retirement, he emphasized how the budget often forced unfortunate choices as he described airplane constituencies and Congress' desire for the Air Force to support them, using funds already allotted to it:

There's people worried about having certain airplanes. You get 'certain airplane-itis' .... Everybody's got their own idea on what it ought to be .... Yes, would I like them all? Sure. Did I want all the 111s [F-111s] they [Congress] gave me? No. We bought 111s for God knows how many years, because Congress kept adding them. And who do you think paid for those? We did. We [the] Air Force paid for them .... It has to do with people who are parochial ... and they stir it up, and they run to Congress, and the congressmen write you and everybody. I've had congressmen tell me, 'Well, I'm really interested in this airplane.' He's no

<sup>(</sup>dismisses Vietnam and Korea); Carlson, "Close Air Support," 51-59 (an example of both items); and GEN Robert Russ, USAF, "No Sitting Ducks," <u>AFM</u> 71 (July 1988): 92-97 (speed). The "do it all" quote is from Hasdorff, <u>Hildreth</u>, 62.

Sources for Welch's predilections are Stevenson, <u>Pentagon Paradox</u>, 17-20; and Lieberherr, Spinney, and Welch, interviews by author. Spinney noted Welch's belief in speed, and Stevenson judged him as a man infatuated with speed and technological sophistication. Stevenson's portrayal was probably too harsh, but Welch clearly expressed his speed preference to this author. Lieberherr served on the Air Force Pentagon staff in the early 1980s, and in his encounters with Welch, noted the general's strong orientation toward planes with air-to-air fighting capability.

Interestingly, in his book, <u>Rise of the Fighter Generals</u>, COL Worden does not discuss fighter leader dogmas as he does with the bomber leaders. This is probably because his account ends just as the fighter generals assume dominance in the Air Force.

more interested in that airplane than the man in the moon . . . he doesn't even know the name of it.

Air Force officers who served in high staff positions during the debate made similar points. To them, the leaders made careful decisions based upon realistic assessments of the budget and combat capability. In an article written at the time, one sharply criticized the F-16 opposition as a willful group with no operational experience who disrupted a well-thought out, straightforward procurement decision.<sup>21</sup>

As for the reformers and Fighter Mafia people who opposed the Air Force decision, that service's action simply defied the historical lessons of combat CAS experience. To these men, the A-10 embodied what those experiences taught, and if anything, they wanted a similar design which only improved upon the Hog's noticeable weaknesses, such as large size and lack of engine thrust. Indeed, they had pushed for such a plane since early 1980s. Reflecting upon the controversy years later, Tom Christie said:

We were absolutely convinced that you had to do a new airplane. The F-16 was not going to do close air support. It was not the right airframe for close air support; and [with] what weapons? It didn't have the weapons [carriage capability], and with high speed, and tracking targets and all that, it just didn't go together, in our book.

<sup>&</sup>lt;sup>21</sup>Block quote is from Russ, interview by author. Other sources are: James Canan, "More Flak in the AirLand Battle," <u>AFM</u>, 71 (February 1988): 79 (Welch's budget priorities); John Correll, "Battle Damage from the Budget Wars," <u>AFM</u> 71 (April 1988): James Dudney, "The Services Take Their Cuts," <u>AFM</u> 71 (April 1988): 16-20; COL Robert Foglesong, USAF, and LTCOL Edward Shirron, USA, "Close Air Support: Its Background and Its Future," <u>Defense 89</u> (July-August 1989): 28-35 (emphasizes money aspect); Marvin Leibstone, "Gone Are the Halcyon Days," <u>Military Technology</u> (March 1988): 43-45; BGEN E.M. Lynch, USA (ret.), "Close Air Support: Its Failed Form and Its Failing Function," <u>AFJI</u> 124 (August 1986): 74; John Morrocco, "USAF Plans to Introduce A-10s into Forward Air Controller Fleet," <u>AW&ST</u> 126 (9 February 1987): 23; MAJ Pat "Doc" Pentland, USAF, "Close Air Support--A Warfighting View," <u>AFJI</u> 126 (September 1988): 94-95 ("sharply" critical staffer ); Ropelewski, "Affordability to Take Priority in USAF Advanced Fighter Design," 14-16 (highlights Russ' procurement budget concerns); and the following interviews by author: Pentland, Russ, Welch, and Yates.

The 1980s found former A-10 test pilot Yates serving first as a F-16 Program Director, and then as Tactical Programs Director at Headquarters Air Force. He said that he tried to be as even-handed as he could in this often bitter dispute, but added that the budget made the CAS F-16 argument compelling.

The CASMARG chairman, Don Fredericksen, also pointed out that the F-16 seriously lacked the survivability features that the CAS plane proponents believed were historically proven requirements. And he also felt that there were viable options because defense contractors approached him with attractive, affordable designs--indeed, he later said that this was a key factor in forming the CASMARG against the Air Force F-16 move.<sup>22</sup>

The Army's new doctrine might emphasize interdiction of Soviet follow-on forces, but the reformers believed that the troops in the field were most concerned with the enemy directly ahead of them. Don Fredericksen observed that from his vantage point, Army officers gave a mixed response to the CAS F-16. Indeed, the TRADOC commander in 1986, General William Richardson, and the late-1980s Army Chief of Staff, General Carl Vuono, both later said that the Army's intention was not to eliminate CAS as a mission. Thus, the reformers saw the Air Force's F-16 CAS plane effort as at best an easy way to buy a follow-on CAS plane—and at worst, nothing less than its leaders' traditional neglect of its CAS commitment for more favored missions.<sup>23</sup>

Keeping in mind his role in creating the F-16, Christie remembered that "Suddenly, we who had pushed the F-16 were viewed as being anti-F-16... we weren't anti-F-16. We were just saying that's not the airplane that was going to do close air support well."

<sup>23</sup>Fredericksen, interview by author; LTCOL Thomas Garrett, USA, "Close Air Support: Which Way Do We Go?" <u>Parameters</u> (December 1990): 42; GEN Richardson, interview by author; and GEN Carl Vuono, USA (ret.), personal interview by author, 5 May 1997, Alexandria, Va., recording and notes in author's possession.

LTCOL Garrett's article--a reprise of his Studies program paper for the Army War

<sup>&</sup>lt;sup>22</sup>"Battle Brews," <u>AW&ST</u>, 19; Burton, <u>Pentagon Wars</u>, 242 (Burton saw the plane as a "symbol of the reform movement); Canan, "More Flak in the AirLand Battle," 79; Congress, House, <u>H.R. 4264</u>, 250-251; Congress, Senate, <u>DoD Authorizations, Pt. 4</u>, 48, 54-55; Morrocco, "USAF Plans," 23; and the following interviews by author Christie (quote), Fredericksen, and Spinney (Spinney called the Air Force approach the "speed is life" tactic).

In his interview with the author, his congressional testimony, and in the above-cited articles, Fredericksen cited survivability studies which rated the A-10 the best against 23 mm AAA--the kind most frequently seen on the battlefield. The F-16 was approximately seven times worse, the A-7 eight times worse, and the AV-8 over ten times worse. In his <u>H.R. 4264</u> testimony, Fredericksen described two elements of "survivability": ability to avoid hits and ability to survive hits. In his <u>DoD Authorizations</u> presentation, he pointed that avoiding hits in the CAS arena was very difficult.

Ironically, the two sides were locked into such a hard fight over what they saw as self-evident truths that they did not often did not cite the results of wars occurring throughout the 1980s. This was perhaps understandable for the Air Force, because these events reinforced the pro-CAS argument against the Eurocentric U.S. Army and foreign air force doctrines which underpinned the American airmen's actions. AirLand Battle predicted a hectic, high-technology fight not only in Europe but allegedly throughout other parts of the world. However, the United States' 1983 Grenada invasion featured house-to-house, infantry-oriented fighting on a small, hilly, tropical island. Armored firepower was neither available nor practical, and the soldiers could not rely too much upon naval gunnery, which was at times too inaccurate for the close-in engagements in Grenada's towns. Instead, they appreciated the close air support which Air Force AC-130 gunships and Navy A-7s provided. The Army's 82nd Airborne Division commander, Major General Edwin Trubaugh, asserted that he would give up all other supporting fires to keep the AC-130s. (A-10s deployed to Puerto Rico, which at a distance of over five hundred miles, was the nearest American land base; but hostilities ended before they could participate.) When the operation ended, one military reformer on the congressional staff cheekily reproved the Army for not following its new doctrine; though in this case, one certainly could not envision swirling tank battles and an extensive interdiction campaign against "follow-on forces." But that was the point. The Eurocentric AirLand Battle and the Air Force's sophisticated fighters did not account for the possibility of such fights.<sup>24</sup>

College---is included here as an example of lower ranking officer support for CAS. He ends his piece with the ringing peroration: "Come on Air Force! Get down, get funky!"

<sup>&</sup>lt;sup>24</sup>Mark Adkin, <u>Urgent Fury: The Battle for Grenada</u> (Lexington, Mass.: Lexington Books, 1989), 225 ("Urgent Fury" was the Grenada invasion's operational code name); CDR Michael Patteson Currie, USN, "Operational Lessons of Urgent Fury" (Research paper, Naval War College, 1988), ii, 9-21, 26-27 (Currie commanded a Navy A-6 squadron in Grenada, and is the source for ground commander praise); Gabriel, <u>Military Incompetence</u>, 160-161, 166-167, 170-171, 178-179; Stephen Harding, <u>Air War Grenada</u> (Missoula, Mont.: Pictorial Histories Publishing, 1984), 22-41, 51-52; David Isby testimony before Congress, House, <u>Roles and Missions of Close Air Support</u>, 23-25 (Isby was a CAS analyst and historian for Washington think-tank BDM Corporation); William Lind, "The Grenada Operation," Report to the Congressional Military Reform Caucus, 5

Korea was a further instructive example concerning CAS and AirLand Battle's relative applicability around the world. This trouble spot featured both sides on a constant war footing, and it required as much of a constant, vigilant, American presence as Europe. But at least through 1988, U.S. Army General Louis Menetrey, who was the Commander in Chief of the UN Command/U.S. Forces Korea, still considered the A-10 his "primary ground support aircraft" because it comprised a "vital part of our ability to meet and defeat the north's highly mechanized formations." The North Koreans had massed their air defenses, but these were not quite as sophisticated as those in Europe, thus allowing A-10s more tactical leeway. Hog pilots even expected to attack from medium altitudes (ten thousand to twenty thousand feet), using both conventional dive bombing and gun strafing. Further, the rugged Korean terrain and heavy in-place defenses on both sides made AirLand Battle's war of wide-ranging maneuver a tough proposition. Indeed, at least one military scholar believed that AirLand Battle did not fully apply to defeating a North Korean attack.<sup>25</sup>

<sup>25</sup>Korea sources are GEN Louis Menetrey, USA, "The US Military Posture on the Korean Peninsula," <u>Asian Defense Journal</u> (August 1988): 14 (quote); MAJ Spencer, "Army Field Manual 100-5 vs Sun Tzu: Operational Problems Facing Korea AirLand Battle Planners," 16-18; and LTCOL Hennigar, GEN Wickham, and LTCOL Wilson, interviews by author. Wickham was supreme commander in Korea from 1979 through 1982, before the A-10 unit set up there. He expected that any conflict would commence at full speed, and immediate air superiority would be the prime air concern. Thus, *any* available attack planes would *have* to handle the air support tasks in an expected high attrition war. Hennigar and Wilson flew Hogs in Korea.

April 1984, Air University Library, copy in author's possession (reformer who "cheekily" reproved the Army; Lind was a staffer for the prominent congressional military reformer, Senator Gary Hart [D-CO]); and LTCOL Swift, interview by author (one of the A-10 pilots who deployed for Grenada).

LTCOL de Czege asserted that AirLand Battle applied to any combat theater ("Army Doctrinal Reform," 107), but in his history, Romjue noted that it was mostly concerned with Europe ("Evolution," 11). The Army's continued European orientation through the 1980s caught the attention of Carl Builder, in his <u>The Masks of War</u>, 138-140, 185-190. Finley's GAO report also points out the doctrine's Eurocentric bent; see Finley, <u>Replace the A-10</u>, GAO, 14.

Foreign air forces encountered similar problems due to neglect of the CAS mission. For all their talk about CAS' inefficiency, the British sure found it useful when wresting the Falklands Islands back from the Argentines in their 1982 war. Their Harriers contributed to winning the Battle of Goose Green, and helped knock out Argentine artillery positions. However, the soldiers and airmen had to reestablish the details of ground-air coordination amidst the fighting. The Israelis had better CAS success during their 1982 "Peace for Galilee" Lebanon invasion, but lack of practice still produced coordination problems, including inadvertent attacks upon their own troops. In the conclusion of their multivolume history of recent wars, military scholars Anthony Cordesman and Abraham Wagner noted that combatant air forces had trouble with CAS because they were never prepared to do it. The two observers concluded that the air services were "almost congenitally incapable of honestly assessing and improving" upon CAS procedures.<sup>26</sup>

Those taking the Air Force and even the Army side might say that the most important American, British, and Israeli air support involved denying their opponents the skies. Cuban planes came nowhere near American troops in Grenada. The British airmen often had to concentrate upon thwarting Argentine air attacks; and at least some Israelis most appreciated their fighter pilots' complete dominance of the skies. Air superiority was and is the most important service that a nation's air force can provide; but why, if one has worked so hard to gain it, must one then accept poor air support due to a lack of emphasis?

Thus, the air forces' congenital--as Cordesman and Wagner put it--disregard for the CAS mission was one reason why they increasingly supported using attack helicopters. Israeli helicopters flew air support missions in Lebanon and later assumed sole

<sup>&</sup>lt;sup>26</sup>Cordesman and Wagner, <u>The Lessons of Modern War, Volume I</u>, 203-205 (Israeli performance); Anthony Cordesman and Abraham Wagner, <u>The Lessons of</u> <u>Modern War, Volume III: The Afghan and Falklands Conflicts</u> (London: Westview Press, 1990), 316-317 (Falklands results); 388 (quote); and Jeffrey Ethell and Alfred Price, <u>Air</u> <u>War, South Atlantic</u> (London: Sidgwick & Jackson, 1983), 55-59, 201-209, 216.

Coordination problems also plagued the Grenada invasion. Ground parties and aircraft often used different radios, and the entire operation featured too many units trying to get in on the action. The A-10s had to wait for their opportunity, which in this case, did not come.

responsibility for Israeli CAS. American attack helicopters flew in Grenada and, throughout the 1980s and beyond, both the Army and Air Force viewed the Apache as an important air support contribution. The Apache joined Army operational units in early 1986, and A-10 pilots enthused over how it enhanced JAAT operations. Its Hellfire missiles provided stand-off ability equivalent to the Maverick missile, and its laser designator could mark targets for the Hog's laser spot tracker. Apache officers in turn praised what the A-10 contributed to combined air support tactics, but some increasingly saw the Apache operating in its own right. Military journal articles appeared in the late 1980s describing how Apaches would single-handedly conduct interdiction assaults in support of the AirLand battle concept; that is, a mission for which the Air Force disqualified the A-10 because it was too slow! In a 1986 Armed Forces Journal International article published as Army aviation became a separate branch within that service, ex-Army aviator and retired Brigadier General John Bahnsen believed that, with the Air Force apparently sneaking away from its CAS commitment and the Army buying more Apaches, the "Air Force should get out of the CAS business." He also found the A-10 wanting in a sortie rate and lethality comparison with the Apache. At least some Army officers then and later wanted the Apache to be the only CAS machine. In a 1982 Army Command and General Staff College thesis, Army Major Max Terrien asserted that the "Army, through its armed helicopter, now has the CAS system it had searched for since 1942." As the CAS plane debate raged in 1989, Army Lieutenant Colonel Emmett White's Army War College research paper claimed that the Apache and Army guided missile systems were far more economical firepower support systems than Air Force fighters.<sup>27</sup>

<sup>&</sup>lt;sup>27</sup>Bahnsen A-10 comparison and quote is in Bahnsen, "A New Army Air Corps?" 77-78. Terrien quote is from MAJ Max Terrien, USA, "Close Air Support: Retrospective and Perspective-Is the Helicopter the Answer?" (Master's thesis, U.S. Army Command and General Staff College, 1982), 81, cited in Riley, "The A-10 Thunderbolt as an Organic Army Asset," 16.

The Israelis' helicopter usage is from James Canan, "More Flak in the AirLand Battle," <u>AFM</u> 71 (February 1988): 79 (cites Don Fredericksen observation about Israeli helicopter-only CAS); and Brereton Greenhous, "The Israeli Experience," in <u>Case Studies</u>, ed. Cooling, 525.

For mutual A-10 and Apache pilot enthusiasm for JAAT, see CAPT Mark Ferrell,

Fortunately, others believed that helicopters and fixed wing planes worked best together. In a 1990 Army War College paper, Army Lieutenant Colonel Edward Littlejohn praised the Apache's capabilities, but concluded that combined fixed-wing and helicopter operations provided the best air support. And in his journal article, Bahnsen observed that overemphasis upon Army attack aviation had an ironic pitfall foreseen by General Momyer in his 1971 Senate CAS hearings testimony:

Aviation service is slowly being divorced from the combined arms team. Take a look at the National Training Center [the Army's combat training range at Fort Irwin, California] . . . On a typical morning, as a battalion task force rolls into battle, an aviation voice comes on the command net and announces that he is God's gift to the upcoming fight. No . . . fully synchronized concept of operation, just a rather disinterested taxi driver

Examples of pro-Apache or at least pro-attack helicopter officer sentiment is in LTCOL John Collins, CT National Guard, "Close Air Support: Another Look" (Study project, U.S. Army War College, 1989), 26, 31-33; Joseph Kruzel, "Perspectives 1986," in <u>American Defense Annual, 1987-1988</u>, ed. Joseph Kruzel (Lexington, Mass.: D.C. Heath, 1987), 102; Mullendore, "The Future of the Joint Air Attack Team in the AirLand Battle," 27-44 (comments upon Air Force apparent abdication of CAS via its F-16 selection, as well as Army's belief that A-10 is less effective than Apache; concludes that unless Air Force buys V/STOL CAS planes or improves first-pass target acquisition capability, the Army should take over CAS with its Apaches); GEN Richardson, interview by author (said that he always worked to keep the attack helicopter zealots in line); LTCOL Emmett R. White, USA, "Close Air Support--A Case for Divestiture Planning in the Department of Defense" (Military studies program paper, U.S. Army War College, 1989), 13-14; and GEN Wickham, interview by author (agreed that there were overzealous younger helicopter officers, but this was why generals were there to rein them in).

Besides the Terrien citation, Riley's "The A-10 Thunderbolt as an Organic Army Asset," 16, cites one other work which supports the Apache-only CAS aircraft idea: MAJ William Backlund, USA, "Can the Army Take Over CAS with Its Organic Aircraft?" (Research report, U.S. Air Force Air Command and Staff College, 1985), 24.

USA, and CAPT Scott Reynolds, USAF, "Apache Thunder: The Advanced JAAT Team," <u>USAAD</u> (May 1989): 2-10. Another example of joint operations enthusiasm is MGEN Frederic Brown, USA, "Attack Helicopter Operations on the Heavy Battlefield," <u>USAAD</u> 31 (July 1985): 2-11. Senior leadership encouragement of Apache-only interdiction is in LTGEN Robert RisCassi, USA, "Army Aviation in the 1980s: The Successes of the First Five Years, the Challenges of the Second," <u>USAAD</u> 32 (January 1986): 2-8; and LTGEN Crosbie Saint, USA, and COL Walter Yates, USA, "Attack Helicopter Operations in the AirLand Battle: Deep Operations," <u>Military Review</u> 68 (July 1988): 2-9.

come to fly around the edge of a battle he knows nothing about . . . Air Force CAS is better coordinated, because a full-time controller is available.

Bahnsen later said that his recommendation for Army-only CAS was tongue-in-cheek; he very much wanted the Air Force's heavy firepower on the battlefield. The Army generals who promoted the Apache interdiction mission qualified their stance by saying that they wanted Apache pilots to exploit creases in air defenses for operations similar to the old cavalry raids. They did not want to attack deep *through* the defenses. Indeed, when pressed, Army leaders conceded that they would use their Apaches cautiously in order to avoid heavy losses.<sup>28</sup>

It was well that they should. Helicopters provided valuable service on the battlefield, whether through reconnaissance, logistics, or fire support; but they required care when used against air defenses. Of the 107 helicopters used in the Grenada invasion, nine were either shot down or damaged severely by defenses which comprised only light, non-radar guided AAA. Most were cargo aircraft, but the rest were Marine AH-1 Cobras which attempted unsupported attacks upon defended positions. The losses were significant enough that nearly all accounts cited helicopter vulnerability as a cautionary lesson. Foreign military arms also encountered these pitfalls in varying degrees. The British used helicopter fire support sparingly in the Falklands War; and while the Argentines downed

<sup>&</sup>lt;sup>28</sup>Examples of Army officers who preferred combined arms CAS action are LTCOL Edward Littlejohn, USA, "Close Air Support: Battle in the Fourth Dimension" (Military studies project paper, U.S. Army War College, 1990), 39-40; and MAJ Riley, "The A-10 Thunderbolt as an Organic Army Asset," 127-129; and LTCOL Thomas Garrett, USA, "Close Air Support: Why All the Fuss?" (Studies program paper, U.S. Army War College, 1990), 41-43 (realistic assessment of helicopter strengths and weaknesses); and Bahnsen, Richardson, Vuono, and Wickham, interviews by author.

Bahnsen quote is from Bahnsen, "A New Army Air Corps?" 78; and Army leader caution about how far to press Apache interdiction is from Bahnsen, interview by author; GEN Glenn Otis, USA (ret.) testimony in Congress, Senate, Hearings before the Committee on Armed Services, <u>DoD Authorization for Appropriations for Fiscal Years</u> <u>1990 and 1991, Part 5</u>, 100th Cong., 1st sess., 6 June 1989, 219-221; and GEN Richardson, interview by author; GEN Glenn Otis, USA (ret.), telephonic interview by author, 12 March 1997, notes in author's possession; and GEN Crosbie Saint, USA (ret.), personal interview by author, 5 May 1997, Alexandria, Va., recording and notes in author's possession.

only a couple of helicopters, the presence of enemy aircraft over the barren islands made British helicopter pilots nervous. One recalled:

There was nowhere to hide, we stuck out like dog's balls . . . . Had I been the Argentine squadron commander I would have said to my guys: 'Their advanced troops are here, their base is there; in between there will be helicopters, go and shoot them down!'

Overall Israeli aircraft losses in the 1982 Lebanon Invasion were perhaps too small to be significant, but the Israelis lost six helicopters versus two fixed-wing planes.<sup>29</sup>

Perhaps the most graphic example of the pitfalls of recklessly using helicopters, or any aircraft, in the CAS environment came with the Soviet experience in Afghanistan. From the late 1960s through the 1970s, the Soviets, like their American rivals, oriented their forces away from over-reliance on nuclear warfare technology to conventional weapons. This also reflected growing the Soviets' confidence in projecting their power in trouble spots around the world, something they demonstrated in Africa throughout the 1970s and 1980s. This behavior climaxed with the Soviet Union's 1979 invasion of its troubled client state of Afghanistan. The ensuing Afghan insurgency was ready-made for

<sup>&</sup>lt;sup>29</sup>Coates and Killian, <u>Heavy Losses</u>, 137-138 (Reformers who criticize what they consider the Army's infatuation with expensive attack helicopters; and who cite Grenada as a reason why this is wrong); Congress, House, <u>Close Air Support</u>, 101st Cong., 27 September 1990, 23; Ethell and Price, <u>Air War, South Atlantic</u>, 162-163, 210-211, 246-251; Adkin, <u>Urgent Fury</u>, 245; Currie, "Operational Lessons of Urgent Fury," 17-18; Gabriel, <u>Military Incompetence</u>, 180-181 (asserts that DoD doctored the casualty reports and that the helicopter losses were double those reported); Greenhous, "The Israeli Experience," 525 (praises the IAF's use of helicopters, and plays down the losses; this follows his overall favorable opinion of IAF CAS); Harding, <u>Air War Grenada</u>, 51-52 (points out that "primitive" AAA incurred losses); Isby testimony before Congress, House, <u>Roles and Missions</u>, 23; SQN LDR Dick Langworthy, RAF, quoted in Ethell and Price, 200 (quote); Lind, "The Grenada Operation," 5 (observes that helicopters do well if they are separated from enemy air defenses by a well defined line, but may not do so on a confused battlefield; this author notes that this was the kind of scenario the Army anticipated in its AirLand Battle doctrine); and Werrell, <u>Archie</u>, 154, 164.

CAS. Only it could provide the quick firepower superiority for the small scale battles which erupted in the remote Afghan mountain fastness.<sup>30</sup>

The Soviets seemed to have the equipment, though their battle doctrine and air support weapons procurement policy differed from the Americans. For their fixed-wing planes, they emphasized what the Western forces called BAI. In 1982, they produced a plane, the Sukhoi (Su)-25 (NATO nickname, "Frogfoot"; for photos, see Appendix Figs. 47-48), which observers initially thought was the A-10's CAS arena adversary. Some pilots called it the "A-9ski," thanks to its visible similarities to Northrop's losing entry in the A-X flyoff. However, the Su-25 was smaller, did not carry a powerful gun, and flew faster than the A-X candidates. The Frogfoot could and did fly CAS in Afghanistan; its straight wing gave it an ability to maneuver at slower speeds and deliver more weapons more accurately than the MiG-21 and MiG-27 fighters which also tried to fly the mission. But observers later concluded that, in any European fight with the West, Su-25s would mostly do BAI missions. (Ironically, it was a design that the U.S. Air Force might have accepted for its follow-on CAS plane.) The reason for the Soviets' air support setup was that they used a rough helicopter approximation of the A-10, the Mil (Mi)-24 (NATO nickname, "Hind"; for photo, see Appendix Fig. 49), for direct aerial fire support of troops in contact. Ugly, heavily armed, and durable (for a helicopter), the Hind came into its own flying CAS missions in the Afghan War's early days. The Frogfoot's appearance garnered

<sup>&</sup>lt;sup>30</sup>The Soviet foreign policy and combat re-orientation are courtesy of: Armitage and Mason, <u>Air Power in the Nuclear Age</u>, 162-163; MAJ Richard Armour, USA, "Soviet Aviation Increases Offensive Threat," <u>Air Defense Magazine</u> (October-December 1982): 15-18; James Coyne, "Frontal Aviation's One-Two Punch," <u>AFM</u> 68 (March 1985): 74-75; James Hansen, "Soviet Projection Forces--Their Status and Outlook," <u>AFJI</u> 119 (October 1981): 76; AVM R.A. Mason, RAF, and John Taylor, <u>Aircraft, Strategy, and</u> <u>Operations of the Soviet Air Force</u> (London: Jane's, 1986), 65-69, 72-76, 82-83; Peter Rodman, <u>More Precious than Peace</u>, 148-152; Harriet Scott and William Scott, <u>The</u> <u>Armed Forces of the USSR</u> 3rd ed. (Boulder, Colo.: Westview Press, 1984), 52-63; "Soviet Air Power: The Ever-Escalating Threat," <u>Pacific Defense Reporter</u> (December 1981-January 1982): 189-204; Bill Sweetman, "New Soviet Combat Aircraft," <u>IDR</u> 17 (January 1984): 35-36; and Kenneth Whiting, <u>Soviet Air Power</u> (Boulder, Colo.: Westview Press, 1986), 194-202.

some notice since it was a new Soviet air support machine, but the Hind's performance retained the Western militaries' rapt attention.<sup>31</sup>

<sup>31</sup>Soviet Air Force air support setup and Mi-24/Su-25 description/rationale are from: Anonymous "B," (senior intelligence analyst who dealt with Soviet tactical aviation issues; good description of Su-25's role in Soviet attack scheme, as well as A-9/A-10 and Su-25 differences), telephonic interview by author; Armour, "Soviet Aviation Increases Offensive Threat," Air Defense Magazine, 16-18; BGEN Samuel Cockerham, USA (ret.), "The Fighting Hind: Soviet Helicopter Warfare," Defense & Foreign Affairs 15 (July/August 1987): 27-30 (does not mention the Hind's recent drastic change of fortune in Afghanistan); Coyne, "Frontal Aviation's One-Two Punch," AFM, 74-75 (sees Su-25 as A-10 counterpart; scouts the A-10 when asserting that the Frogfoot has "proved itself to be as good as the US A-10 is designed to be"; 74); David Isby, telephonic interview by author. 19 September 1997, notes in author's possession; Mason, Air Power: A Centennial Appraisal, 96-98; Mason and Taylor, Aircraft, Strategy and Operations, 68-83; Pentland, interview by author (also takes same view of Su-25 role as Anonymous "B"); William Schneider, Jr., "Soviet Frontal Aviation," in The Soviet Air Forces, ed. Paul Murphy (Jefferson, N.C.: McFarland & Company, 1984): 145-147 (describes Frogfoot and Hind; still sees Frogfoot mission as CAS); Bill Sweetman, "Frogfoot: A New Shturmovik on Trial," Interavia (August 1983): 830-832 (A-10/Su-25 similarities and differences: Su-25 is faster but has less weapons carriage and loiter capability); and Bill Sweetman, "Sukhoi Su-25 Frogfoot: STOL [Short field TakeOff and Land] Striker for the Pact," IDR 18 (November 1985): 1759-1762 (more on A-10/Su-25 differences, especially in design and mission; observes that Su-25 seemed to fit U.S. Air Force's follow-on CAS plane needs).

The Soviet Air Force's general Afghanistan fortunes, as well as the Frogfoot and Hind's specific combat performance, are from: Cockburn, <u>The Threat</u>, 133; Cordesman and Wagner, <u>Lessons of Modern War, Vol. III</u>, 174-201; Coyne, "Soviet Aviation's One-Two Punch," 74-75; Everett-Heath, <u>Helicopters in Combat</u>, 120-144; Mason, <u>Air</u> <u>Power</u>, 188-189; Mason and Taylor, 93-96; Lon Nordeen, "The Close Air Support Debate," <u>Military Technology</u> (February 1990): 39-40 (Afghan Rebels especially feared the Mi-24); Orr, "Invasion of Afghanistan," 293 (the Hind is "greatly feared"); Sweetman, "Frogfoot: A New Shturmovik on Trial," 830-831 (asserts that its status is uncertain due to the Hind's battlefield success); Sweetman, "New Soviet Combat Aircraft," 35-36; Whiting, <u>Soviet Air Power</u>, 196-202.

During Soviet ground operations in Afghanistan, fixed-wing planes pounded the area into which Soviet troops were to advance, followed by helicopter cleanup operations. The troops would then arrive.

Anonymous "B" told the author to check A-9/Su-25 details to see the differences. Indeed, when comparing the planes' features as presented in Sweetman's "Sukhoi Su-25 Frogfoot," and Watson's "The A-10 Close Air Support Aircraft," 13-24 and Appendix I, one sees similarities but many contrasts. Both featured a high wing, similarly mounted engines within the fuselage, and various survivability features. However, the Frogfoot was one-fifth smaller than the A-9, its wing was thinner both frontally and longitudinally (for

That is, until late-summer 1986, when the Americans supplied the Afghan rebels with a U.S. Army shoulder-launched, heat-seeking SAM, called "Stinger." Until then, Soviet aircraft occasionally had to use some self-protection tactics in situations where they expected to encounter Aghan resistance, which largely consisted of old rifles and the occasional stolen Soviet SA-7 shoulder-launched heat-seeker SAM. But the Stinger was a far more capable and lethal man-portable SAM than the SA-7, and it downed one hundred Soviet helicopters in the next eighteen months. The Stinger did not drive the Soviet Air Force from the skies as some asserted, but it definitely affected the Soviets' ability to carry the war to the Afghan rebels. Fixed-wing pilots had to adjust their attack altitudes high enough to avoid the SAMs-so high, that disgruntled ground troops started calling them "cosmonauts." Though Su-25s managed some adjustment to reduce losses, the effect upon both Hinds and transport helicopters was nearly catastrophic. They already suffered the lion's share of Soviet air losses before Stinger-the final tally was 80 percent at war's end--but the American SAM's arrival denied entire areas to helicopter action, since a helicopter could neither outclimb, outmaneuver, nor outrun the missiles. (Both they and some attack planes tried very low attacks but took losses from small arms fire).<sup>32</sup>

more speed), and it carried one-third less ordnance. The A-9's speed was roughly the same as the A-10's, which meant that both A-X competitors were slower than the Su-25. The Su-25's cockpit was more enclosed, its intakes sat higher on the fuselage, and its tail area design was distinctly different. Still, curiosity exists about the source for the Su-25 design.

<sup>&</sup>lt;sup>32</sup>Cordesman and Wagner, <u>The Lessons of Modern War, Vol. III</u>, 174-186, 194-201 (loss statistics, 175-176); Everett-Heath, <u>Helicopters in Combat</u>, 144-156; Isby, interview by author; David Isby testimony in Congress, House, <u>Roles and Missions of</u> <u>Close Air Support</u>, 28, 42; Mason, <u>Air Power</u>, 188-189; Nordeen, "The Close Air Support Debate," 39-40 (Soviet high and low avoidance tactics; and combined arms suppression efforts); Rodman, 336-340 ("cosmonauts" quote, 339; Rodman served as the President's Deputy Assistant in the National Security Council during this time); "Sukhoi Incorporates Changes to Su-25 Based upon Afghan Combat Experience," <u>AW&ST</u> 130 (19 June 1989): 31; and Werrell, <u>Archie</u>, 165-166.

Just as he praises American helicopters in Vietnam, Everett-Heath defends post-Stinger Soviet helicopter performance. He writes that the Soviets used special forces to attack known Stinger locations, and that Hinds flew more at night and used decoy flares. Cordesman and Wagner, Isby, Mason, and Rodman contradict him (Isby had visited the Afghan Rebels), emphasizing that the SAM denied helicopters battlefield access that they

### The Conditions of the Debate

But in the American air support world, the real fights faded against the dispute which waxed most intense from 1986 through 1990. The two sides of the CAS plane debate focused upon the merits of the CAS F-16 and any prospective competitor, and used bureaucratic, political, and public media avenues to get their way. The argument waged in the defense media was the most colorful, and alternately the most confusing and informative. Perhaps it was best that the controversy remained focused upon Europe and the respective planes' merits, because it always threatened to spin out of control. For example, TAC commander Russ assigned one of his top staffers, along with Army TRADOC officers, to determine a joint Air Force and Army definition of CAS which could provide a reference point from which to argue their case. After a few months, the officer gave up, overwhelmed by the disparate views. And in spite of his astute comment about individual CAS perspectives, Brigadier General E.M. Lynch himself illustrated the problem. Lynch's journal article echoed many Army officers' impatience with the dispute, since they only wanted the Air Force to provide CAS when needed. Lynch prescribed more attention to practicing the mission than to the planes designated to fly it; to him, the airplane argument emphasized form over function. Smooth air and ground force coordination was the most important requirement for good CAS, but Lynch missed a major tenet of the argument: whether the type of plane determined how well that coordination occurred. F-16 opponents observed that dedicated CAS plane units like those

once enjoyed. Isby observed that the Stinger appeared as the Soviets started de-escalating their involvement, which made their pilots even more cautious about the SAM (he also asserted that the Soviets never thought much of fixed-wing CAS anyway). Also, even Everett-Heath admits that the Hinds limited their operations due to Stingers.

The <u>AW&ST</u> article mentions a combat problem with the fuselage-mounted engines of the Su-25-a concern which led some to prefer the A-10 over the A-9 in the A-X flyoff. When one engine on the Frogfoot was hit, flames and/or engine parts often affected other aircraft components and the other engine, causing numerous aircraft losses. The Soviets installed stronger bulkheads between the engines; and this modification, plus the plane's survivability features, led to no further losses. The article featured an Su-25 at the Paris Air Show which the Soviets claimed had withstood direct hits from two air-to-air missiles fired by a Pakistani (?) F-16.

flying the A-10 practiced CAS all the time, while an F-16 outfit would not. Different perspectives were not limited to these two services. At times, someone asked why the Air Force could not do CAS like the Marines--just as senators had asked the same question over fifteen years earlier during their 1971 CAS Hearings.<sup>33</sup>

Even among the principals involved--the Air Force and Army on one side and the CAS plane advocates on the other--the "fog of debate" equalled Clausewitz' "fog of war." As the dispute intensified, each side overstated its case, generating criticism both inside and outside its own ranks--not to mention extraneous responses such as, "Do CAS like the Marines do with their Harrier jets!" Indeed, dissension within the Air Force/Army side made its case hard to present, while the opposition was itself a loose coalition of groups and individuals. Yet for all that, the debate illustrated what shaky ground upon which the Air Force CAS plane rested--be it an A-10, A-7, or F-16. Further, it provided the visible smoke and flame for the more serious bureaucratic and political fight underway at the same time. One could not really understand some of the official moves without first knowing the battle for opinion. A good starting point is the supported service in the CAS equation, along with its public stance during this doctrinal and media food fight.

## Debate: The Army Side

The Army leadership officially supported the Air Force's course of action. In the late 1980s, Army Chief of Staff Vuono repeatedly emphasized that the 1985 Army-Air Force follow-on CAS plane agreement *was* the Army's position. As other Army leaders pointed out, this followed the spirit of both AirLand Battle doctrine and the ensuing 31 Initiatives. Weighing into the debate with a public communiqué in 1989, the Commander in Chief of U.S. Armed Forces in Europe, General John Galvin, stated that "it seems to me

<sup>&</sup>lt;sup>33</sup>Fredericksen, interview by author; Lynch, "Close Air Support: Its Failed Form and Its Failing Function," 72-78; C.E. [Chuck] Myers, Jr., "Air Support for Army Maneuver Forces," <u>AFJI</u> 124 (March 1987): 46-47; and Russ, interview by author.

Russ' staff officer was the future Air Force Chief of Staff, Mike Ryan. Fredericksen and Myers both mentioned that the A-10 guaranteed dedication to making CAS work.

that the F-16 provides the flexibility and capability that I need." During congressional hearings that same year, the former U.S. Army Commander in Europe, retired General Glenn Otis agreed, testifying that he preferred planes flexible enough to handle both CAS and interdiction missions. Others made statements which recalled Brigadier General Lynch's desire that the Air Force skip the messy CAS plane procurement details and simply support the Army when needed. As one staffer put it, "The Air Force doesn't tell the Army how to fight the land battle, and the Army doesn't tell the Air Force how to fight the air battle." In the meantime, according to the TRADOC Commander, General Maxwell Thurman, the Air Force fulfilled its obligations with flying colors: "We put up the requirements. They satisfy them .... In reality, all tacair missions support the Army." There was also another factor, though the Army leadership did not mention it openly. The supporting service was coequal in status, not only in combat but also in budget considerations. So, arguing with the Air Force risked not only losing the means for support, but it also chanced creating unwanted congressional attention which threatened both services' wishes. Brigadier General Bahnsen later said that the Army could not argue for the A-10 because the Apache was too precious to it; and at least one other source close to the debate asserted that the Army accepted the Air Force's CAS F-16 in return for that service's tacit support of its buying guided missile artillery and even more advanced helicopters. Indeed, Aviation Week & Space Technology reported in 1987 that the Army omitted any reference to CAS in the operational analysis of its proposed multipurpose LHX (Light Scout/Attack/Utility) helicopter. It could not afford a roles-and-missions debate at such a sensitive time.<sup>34</sup>

<sup>&</sup>lt;sup>34</sup>Barbara Amouyal, "Gen. Galvin Favors F-16 for CAS Role; Pentagon Reserves Judgment," <u>Defense News</u>, 10 April 1989, 21 (quote); "Army's Analysis of LHX Helicopters Will Omit Close Air Support Issue," <u>AW&ST</u> 126 (16 February 1987): 18; Builder, <u>Masks of War</u>, 24 (observes that the Army increasingly embraced high technology "toys"); James Canan, "Sorting Out the AirLand Partnership," <u>AFM</u> 71 (April 1988): 53 (staffer quote); Congress, Senate, Hearings before the Committee on Armed Services, <u>DoD Authorization, FYs 1990 and 1991, Part 5</u>, 218-219 (Otis testimony); Correll, "Battle Damage from the Budget Wars," 41 (Thurman quote); Littlejohn, "Battle in the Fourth Dimension," John Morrocco, "USAF Plans to Introduce A-10s into Forward Air Control Fleet," <u>AW&ST</u> 126 (9 February 1987): 23; and the following previously cited interviews

However, not everyone in the Army agreed with the Air Force's CAS plane choice. There were the obvious examples, such as the attack helicopter zealots who wanted CAS for themselves—and General Menetrey in Korea who thought the A-10 did well enough in his operational theater. An <u>Aviation Week & Space Technology</u> article covering the Air Force's Aerospace Power Symposium which convened a few weeks after General Russ' CAS F-16 announcement noted resistance among officers of all services. It observed that, although both Air Force and Army leaders supported the move and perhaps had legitimate budgetary reasons for doing so, junior officers still thought the F-16 less capable than the A-10. About a year later, even one former Army Secretary, James Ambrose, proclaimed that the Air Force did not support the Army enough if it was unwilling to fund a new dedicated CAS plane. The <u>Air Force Magazine</u> article featuring General Thurman's assertions of interservice cooperation did so partially in response to Ambrose's charges; but it also noted that "a substantial faction in the Army bitterly opposes

Though the work has no publication date, a review of Army MAJ Charles Kirkpatrick's Army Center of Military History Analysis Branch work, "The Army and the A-10" indicates that it appeared during the time of the debate. Focusing upon the years 1961 through 1971, he concludes that though the Army wanted better air support from the Air Force, the type of Air Force plane used for CAS "was not the most important consideration" (36). The Army knew that a CAS-oriented design would guarantee CAS commitment, but understood that the most important air support was air superiority. Interestingly, Kirkpatrick's work does not focus upon the mid-1970s, when the Army seemed more amenable to the CAS plane design. Instead, it ends at a time when the Army's Cheyenne project was still alive and that service was ambivalent about an Air Force plane that was the Cheyenne's competition.

The Army leaders interviewed applauded AirLand Battle's offensive orientation as well as their own helicopters which provided such flexible fire support. And while they agreed that Air Force interdiction perhaps best supported the new doctrine, they still wanted (one could say they even seemed nervous about this) the Air Force to remember its CAS obligation. *None* wanted to see that commitment erased.

by author: Bahnsen, Fredericksen, Myers (the "other source close to the debate"), Saint, Spinney, Vuono, and Williams.

Fredericksen, Myers, and Spinney all noted that the Army leadership supported the Air Force's decision. Fredericksen recalled that Vuono used "The Army does not tell the Air Force how to buy planes ... " reasoning when he talked to him. Myers and Spinney observed that Army leaders seemed to agree with the Air Force in return for no Air Force interference with their own procurement choices.

the Air Force's plan to employ a modified fighter, the A-16 [the Air Force's designation for the CAS F-16], for close air support rather than designing a new airplane from scratch for that role." But true to military discipline, no officer directly challenged the leaders' course. Instead, the opposition remained nameless, but nonetheless potent, as it bubbled forth in research papers, informal conversations, and the odd newspaper article. It was not much, but it contributed to the more public opponents' conviction that they were right.<sup>35</sup>

### Debate: The Air Force Side

The Air Force was more aggressive, since the controversy directly involved its actions. Also, the service had experience selling its point of view. Its leaders well understood that winning the public debate could secure the congressional dollars which in turn powered this most technology-oriented of all the services. Past budget, doctrinal, and procurement policy battles had finely honed the skill: the 1920s and 1930s' status struggles within the Army, the late 1940s bomber-versus-aircraft carrier controversy, the Korean CAS squabble, and even the selling of the A-10 in the 1970s. Pursuing its argument through the defense press, formal studies, a flight test, and even at least one professional historian, it still had difficulty making its case, as General Russ' anecdote about defining CAS indicated. The intensity of and stakes involved in the dispute also inspired inflated claims, which by 1990 produced the following general line of reasoning. The Army's AirLand Battle doctrine demanded a more flexible plane to support it, and many of the

<sup>&</sup>lt;sup>35</sup>Jack Anderson and Dale Van Atta, "Air Force Plan Encounters Army Flak," <u>The</u> <u>Washington Post</u>, 28 December 1990, E5; Correll, "Battle Damage," <u>AFM</u>, 41 (quote); "Defense Dept. Asks USAF to Broaden Design Options for New CAS Aircraft," <u>AW&ST</u> 127 (23 November 1987): 28-29 (Ambrose's opinions); Fredericksen, interview by author (noted that there were "mixed opinions" within the Army about the F-16); Garrett, "Close Air Support: Why All the Fuss?" (Military Studies program paper, U.S. Army War College, 1990), 3 (Garrett observes in his introduction that although the two services' leaders agreed on buying F-16s, the lower ranks at the Army's service schools questioned it); Brendan Greeley, "USAF, Army Grapple with Key Issues of Close Air Support Mission," <u>AW&ST</u> 126 (23 March 1987): 50-51; Littlejohn, "Battle in the Fourth Dimension," 5-6; and Yates, interview by author (noted that informally, Army officers supported the A-10).

sources predicted a lethal "non-linear" battlefield, for which the A-10 was not suited. Indeed many sources kept referring to the "non-linear battlefield," "high-tech battlefield" or the "the battlefield of the 90s," where strong air defenses and AirLand Battle's envisioned pell-mell, ultraflexible fight made fast, multipurpose planes like the F-16 mandatory. Interdiction was always a more lucrative Air Force mission than CAS anyway, especially in a time of shrinking budgets which forced hard procurement choices. Concerning questions about the F-16's CAS suitability, F-16 proponents had two answers. They redefined CAS as something resembling BAI. Second, they asserted that technological advances in targeting and fire-control equipment made the first-pass acquisition and destruction of CAS/BAI targets a cinch, regardless of aircraft speed.<sup>36</sup>

The Air Force apparently tested the waters for the CAS F-16 at its Aerospace Power Symposium just after Russ' F-16 announcement, and the meeting's conduct and reception foretold the difficulties to come. The symposium's theme just happened to be tactical air support of ground forces and whether new technologies and warfighting styles

<sup>&</sup>lt;sup>36</sup>The "battlefield of the 90s" mantra, or something quite like it, can be found in Barbara Amouyal, "Pentagon Expected to Assign Role of CAS to F-16," Defense News, 18 June 1990, 45 (cites TAC Deputy Commander for Requirements, GEN Joseph Ralston's claim that "the battlefield of the 1990s" requires aircraft capable of attacking front-line and rear echelon forces); CAPT Mark Barrett, USAF, "Close Air Support: The Debate from a FAC's Perspective," Infantry 78 (May-June 1988): 33 ("today's high-tech battlefield"); Canan, "More Flak in the AirLand Battle," 79 (cites Welch and TAC Vice Commander, General James Brown, about the battlefield of the 1990s); James Canan, "Sorting Out the AirLand Partnership," 52-53 (cites Russ about battlefield of the 1990s); MAJ Robert Chapman, USAF, "Technology, Air Power, and the Modern Theater Battlefield," Air Power Journal 2 (Summer 1988): 47-50 (charges readers to embrace the new battlefield); Steven Daskal, "Adapt Tactical Air to AirLand Battle," Journal of Defense and Diplomacy 5 (April 1987): 17-20 (hails the new fluid, complex battlefield); LTCOL Robert Hinds, USAF, "Replacing the A-10" (Defense analytical study, U.S. Air Force Air War College, 1989), 3 ("The CAS role of the 1990s is different from that of the 1970s."); Pentland, "Warfighting View," 92 ("The high-tempo nonlinear battlefield of the future does not permit simplistic views of the operational utility of performing CAS."); and GEN Robert Russ, USAF, "The Air Force, the Army, and the Battlefield of the 1990s," Defense 88 (July/August 1988): 12, 14 (look at the title).

The Air Force's ability to "sell" a weapon via politics, public relations, and other means, forms one of the major themes of Kotz' <u>Wild Blue Yonder</u>.

rendered traditional methods obsolete. Besides the before-mentioned opposition among some of the attendees, some of the speakers still preferred traditional CAS and the A-10 that flew it. Further, an RAF Harrier pilot extolled his jet's virtues, just to muddy the topical waters a little more. On the other hand, Lieutenant Colonel Price Bingham, an Air Force fighter pilot and then-Air University staff officer, presented a version of the Air Force position which strongly favored interdiction over CAS. Echoing Air Force sentiments from previous decades, he dismissed wars featuring a high CAS demand, such as Korea and Vietnam, as anomalies. To him, interdiction historically yielded better results for the effort, and in any future European war, the Soviets would easily disrupt the CAS procedures and destroy the CAS planes spawned by those other conflicts. Far better to adhere to the flexible offensive-mindedness embodied in the Army's new doctrine. Some other speakers seconded Bingham or focused upon how to incorporate the F-16 into its new mission. Two F-16 pilot speakers pointed out that its speed required that target information be somehow rapidly and easily transferred to its fire control computers, which could then provide to the pilot a head-up display symbol overlaying the target.<sup>37</sup>

<sup>&</sup>lt;sup>37</sup>All of the following are page reference-cited from the Proceedings of "Air Support of the Close-In Battle: Past Lessons, Present Doctrine, Future Directions," <u>U.S.</u> <u>Air Force Aerospace Power Symposium</u>, Air War College, MAFB, 9-10 March 1987. Those following some or all of the service line were CAPTs Pete Bonnanni and Scott Lawrence, USAF, "High Threat Close Air Support: Problems and Solutions," 119-133 (the "two F-16 pilot speakers"); LTCOL Price Bingham, USAF, "Air Power and the Close-In Battle: The Need for Doctrinal Change," 5-49; MGEN Fred Haynes, USAF (ret.), and COL Glenn Jones, USMC (ret.), "Air Support of the Close-In Battle: Future Directions," 109-118 (with envisioned battle arena, they see A-10 as a "problem," 112); and MAJ Wilfred Merkel, USAF, "Close Combat Air Support-A European Perspective," 154-158.

The speakers who favored CAS and/or the A-10 were CAPT Mark Bucknam, USAF, "The Air Component Commander's Role in Ensuring Mass of CAS Assets in NATO's Central Region," 160-170 (recommendations for best use of A-10s in Europe); LTCOL James Terry, USAF, "A-10 Operations and the Battle for Norway," 171-283 (sees a role for the A-10 in this theater); MAJ Duane Tway, USAF, "Close Air Support until the Year 2000: Now Is the Time for Tough Decisions," 76-83 (wants modified A-7s and reengine A-10s); and MAJ Westenhoff, USAF, "Close Air Support: Battlefield Challenges, Strategic Opportunities," 56-75 (wants improvement in target acquisition technology and an orientation change from defensive CAS to offensive CAS--cites

The service and sympathetic individuals took its case to the defense media. Lieutenant Colonel Bingham repeated his symposium assertions in the <u>Armed Forces</u> <u>Journal International</u>'s September 1987 edition, with an article entitled "Dedicated Fixed-Wing Close Air Support--A Bad Idea." The service also got help from sympathetic journalists. Steven Daskal, a "widely published defense systems analyst in Northern Virginia," told readers that with AirLand Battle, "Attrition warfare is finally being pushed out of the limelight," and seconded Bingham's call for interdiction. Former Marine aviator, writer, and then-LTV Products Group employee Allan Bloom hailed the Air Force's proposal to modify A-7s instead of buying a dedicated CAS plane.<sup>38</sup>

For the Air Force Association's (AFA) <u>Air Force Magazine</u>, an about-face was in order. It had published a favorable piece on A-10 European CAS in July 1983; and as late as November 1986, it included an air support article discussing the plane in mostly favorable terms while hinting at replacement efforts. It changed its tune in March 1987, just after Russ' CAS F-16 announcement. In "New Roadmap for the Airland Battle," Senior Editor Edgar Ulsamer discussed the doctrinal and budgetary imperatives for the service's choice, as well as how the A-10's thick wing condemned it to slow speed and replacement by the F-16 and the modified A-7. As the debate escalated in 1988, AFA

historical examples of this, such as Allied Gothic Line breakthrough in World War II Italy and the Korean War Pusan breakout).

The RAF speaker was Group Captain G.R. Pitchfork, MBE, "Harrier in Support of the Close In Battle," 134-153.

<sup>&</sup>lt;sup>38</sup>LTCOL Price Bingham, USAF, "Dedicated Fixed-Wing Close Air Support--A Bad Idea," in <u>AFJI</u> 125 (September 1987): 58-62; and Daskal, "Adapt Tactical Air," 17-20.

Bingham publicly touted his pro-interdiction beliefs. Besides the <u>AFJI</u> article, there is his "Ground Maneuver and Air Interdiction in the Operational Art," <u>Parameters</u> 19 (March 1989): 16-31. After military retirement, he worked for Northrop-Grumman Aircraft Company's Joint Surveillance Target Attack Radar System (JSTARS) aircraft program. With good conditions, the JSTARS plane can detect and track vehicular movements behind enemy lines, providing even more justification to those who, like Bingham, believe that interdiction is *the* air support mission. See his "It's the Best Thing Since Gunpowder," <u>Naval Institute Proceedings</u> 123 (January 1997): 45-49 (*praise* for JSTARS).

writers presented the Air Force position no less than four times. These discussed not only the familiar budgetary, threat, and doctrinal imperatives behind its decision, but also asserted that the A-10 was too slow to accompany the large, mixed-fighter, "Gorilla," formations which NATO airmen claimed were necessary to puncture Soviet air defenses.<sup>39</sup>

The threat vulnerability issue appeared often, though most writers used generalities to describe what change in air defenses made the F-16 a more attractive CAS choice. Also, as <u>Air Force Magazine</u>'s somewhat abrupt turnaround indicated, it arose quickly. As such, it recalled some defense observers' claims that the Air Force occasionally inflated the Soviets' threat capabilities in order to convince Congress that it needed a new plane. SAC had cited increased Soviet threats to justify new bombers, and the defense reformers asserted that the service more recently did the same thing to buy the most expensive and sophisticated fighters. The object of the exercise was to describe how the current model failed to meet the new challenge while simultaneously pointing out how the new machine solved the problem.<sup>40</sup>

Gorton also writes that a simple follow-on plane would not be N/AW capable, and that the Air Force cannot do CAS like the Marines. However, he disingenuously states that the CAS plane debate is recurrent—"occurs about every seventeen years and is normally associated with the aging of the principal aircraft designed to perform the mission" (102). Perhaps the A-1's age was a factor in the A-X program's birth, but this work has been about how the A-10 was the *first* Air Force plane primarily designed for this mission.

Interestingly, Russ' public F-16 statement, which was at an AFA convention, surprised some of the audience because by that time, OSD clearly did not want the F-16; see "Russ' Support of F-16 Revamp over New Ground Support Plane Shocks AFA," <u>Defense News</u>, 2 February 1987, 4.

<sup>40</sup>Observers/critics who discuss the Air Force's intelligence estimate cum procurement action are Brown, <u>Flying Blind</u>, 233-234, 310-326; Cockburn, "The Air Force: Keeping Up with the Joneses," chap. in his <u>The Threat</u>, 139-156; Fallows,

<sup>&</sup>lt;sup>39</sup>The previous <u>Air Force Magazine</u> articles are Jeffrey Rhodes, "Improving the Odds in Ground Attack," 69 (November 1986): 48-52; Schlitz, "Getting A-10 Firepower Forward," 44-51; and Edgar Ulsamer, "New Roadmap for the AirLand Battle," 70 (March 1987): 108-113. The four 1988 <u>Air Force Magazine</u> articles are: James Canan (another of its Senior Editors), "More Flak in the AirLand Battle," 71 (February 1988): 76-80; Canan, "Sorting Out the AirLand Partnership," 50-59; Correll, "Battle Damage from the Budget Wars," 38-44; MGEN William Gorton, USAF (ret.), "Of Mudfighters and Elephants," 71 (October 1988): 102-107.

Whether or not one believed the service ever exaggerated threat estimates for procurement purposes, the F-16 proponents seemed to follow the process. However, like much else in this debate, their case was not entirely convincing. The only specific comments about Soviet ground-to-air defense improvements mentioned that a new radar-guided AAA gun and a Stinger-type SAM would soon appear. There were also new Soviet fighters with better radar-guided missiles. The F-16 advocates claimed that survivability features were no longer as valuable, since some SAM warheads' lethality exceeded even a rugged A-10's capacity to survive being hit by them. Further, they asserted that Soviet defenses would often be very densely packed, preventing the A-10 from attacking BAI targets. The observations about SAM warhead lethality and thick defenses were not new. And as for the threat enhancements, the Air Force had tested the Hog against similar defenses during the A-7 flyoff and TASVAL. The F-16 proponents claimed that their plane would defeat the newest weapons by using countermeasures such as chaff, flares, and jamming. Further, it would beat thick defenses by using either different altitudes or careful routing. This raised the unanswered (at least by the F-16 side) question of why the A-10 could not also use all of the available countermeasures devices--or why it could not use different routing to avoid the toughest opposition. Several times, F-16 proponents claimed that their plane's speed would allow it to avoid the hail of flak in the battle area, but the CAS F-16 carried its attack weapons externally, thus practically limiting it to sub-sonic speeds. This was also the maximum speed attained by IAF jets against heavy Arab defenses in the Yom Kippur War's early days-and it did not help in that case. The F-16 defenders also forgot lessons closer to home. Air commanders forbade even fast planes to conduct low altitude attacks in Korea, and the Vietnam War confirmed that fast jets got hit when conducting air support through intense AAA and small arms fire--the lessons derived from the latter conflict inspired the A-10's survivability features. The Soviets probably would not use their top interceptors to shoot fleeting attack

<sup>&</sup>quot;Magicians," chap. in his <u>National Defense</u>, 35-75; and John Prados, <u>The Soviet Estimate</u>: <u>U.S. Intelligence Analysis & Russian Military Strength</u> (New York: The Dial Press, 1982), 41-50. Kotz' <u>Wild Blue Yonder</u> can be said to address this as a theme.
planes at or near the front when greater threats existed from NATO interdiction raids and fighter sweeps. And NATO fighters would not fail to contest any Soviet air superiority attempt over the battle area--and if air superiority was lost over the front, World War II proved that air support would be very difficult until *dedicated* fighters regained it.<sup>41</sup>

The air defense claims revealed the intensity of the service's public relations campaign, and the years 1988 through 1990 featured even more such efforts. An <u>Armed</u> <u>Forces Journal International</u> article by former A-10 pilot and then-Air Force Pentagon staffer, Major Pat "Doc" Pentland, pointed out that the Air Force amply supported the Army with either dedicated or multirole units, and asserted that the current understanding of CAS was too wedded to the Vietnam War. Air Force and Army leaders had assessed their own needs and redefined it to emphasize interdiction. Thus Pentland condemned CAS F-16 opponents as civilian "armchair experts" obstructing the fighting men's well-planned scheme. Pentland's air support unit statistics were misleading, and led one to ask if they would be as high if the *dedicated*, read A-10, units were removed. Further, he

<sup>&</sup>lt;sup>41</sup>Canan, "More Flak," 79; LTCOL Bruce Carlson, USAF, "Close Air Support," <u>Military Review</u> 69 (June 1989): 55 (cites avoidance and countermeasures as means for defeating threats); VADM Thomas Connolly, USN, quoted in Head, "A-7," 130; COL Robert Foglesong, USAF, and LTCOL Edward Shirron, USA, "Close Air Support: Its Background and Its Future," <u>Defense 89</u> (July-August 1989): 33 (general assertion about A-10 and defenses); Gorton, "Mudfighters and Elephants," 106; Brendan Greeley, "Speed, Stealth, Maneuverability Sought for Survivable Close Air Support," <u>AW&ST</u> 123 (27 April 1987): 143-145; Huenecke, <u>Modern Combat Aircraft Design</u>, 216-218 (page references to reprint); Nordeen, "The Close Air Support Debate," 39-40 (cites Stinger influence); Pentland, "Warfighting View," 94 (same as Carlson; also comments upon increased lethality of missile warheads); Russ, "The Air Force, the Army, and the Battlefield of the 1990s," 14 (cites threat avoidance and countermeasures as F-16's means of beating defenses--but speed and maneuverability would be the most important survivability factors).

Greeley's article was the only one which specifically described ground threats, though Nordeen discussed the Stinger. Carlson and Pentland mentioned fighter threats. Connolly (Vice Chief of Naval Operations for aviation issues at time of interview) told Head that external stores made supersonic flight impractical if not impossible--it also featured very high fuel consumption. Huenecke did not specifically say this, but pointed out that external stores induced seriously speed and performance penalties. In fact, the weapons might not be releasable at high speeds.

based his CAS redefinition upon a vision of future war which did not square with trends revealed by 1980s combat. Air Force FAC Mark Barrett's Infantry magazine piece described A-10 forces in Europe as neither viable nor numerous enough to meet anticipated demand, and thus argued for CAS F-16s. But who could say that the F-16s would be used for CAS, and if so, would they do any better? Pressing the F-16's case in Military Review, Lieutenant Colonel Bruce Carlson asserted that "The A-10 never was the optimum solution for CAS in a high threat environment." This was interesting, considering all of the Hog's survivability features and multiple tests. (These and other errors in Carlson's piece earned a rebuttal letter from another Air Force officer.) In Defense 89, Air Force Colonel Robert Foglesong and Army Lieutenant Colonel Edward Shirron supported all of the Air Force arguments, and especially emphasized the budget aspect. However, A-7s and F-16s modified to fly CAS would not be cheap either. Extolling to Air Power Journal readers the march toward more advanced airpower technology, Air Force Major Robert Chapman wrote that the "handwriting was on the wall" for the CAS mission, as it was for horse cavalry earlier in the century. Chapman waxed dramatic about the fluid, nonlinear battlefield, saying that it "may be unlike anything we have ever experienced ..... Death and annihilation will await individuals and units that cannot respond to quickly changing circumstances."42

Pentland later recalled that he wrote his article out of sheer frustration with efforts to block the CAS F-16 move. He also claimed that service leaders asked Folglesong to write his, after they decided that a more senior officer writing it would seem like an overreaction. Pentland claimed that the Air Force maintained ten dedicated CAS/BAI wing "equivalents." An "equivalent" by Pentland's reckoning was three squadrons. Counting all A-10 and A-7 active duty *and* Air National Guard/Air Force Reserve squadrons existing at that time yields close to ten wings; but several of these Guard/Reserve units were already slated to receive F-16s.

The Carlson rebuttal letter points out that the A-10 was not an "aging" (Carlson,

<sup>&</sup>lt;sup>42</sup>Barrett, USAF, Debate from a FAC's Perspective," 32-34; Carlson, "Close Air Support," 51-59 (former Air Force Pentagon staffer; quote, 54); Chapman, "Technology, Air Power," 42-51 (first quote, 43, second quote, 50); Foglesong and Shirron, "Close Air Support: Its Background and Its Future," 28-35 (each was his respective service's "Chief of Staff Chairholder" at the National War College); Pentland, "A Warfighting View," 92-96 (quote, 96); and Pentland, interview by author. <u>Air Power Journal</u>, by the way, was the re-named <u>Air University Review</u>.

Chapman's battle arena depiction was one of the many technology-based predictions about future war which buttressed not only the Air Force's CAS F-16 case, but also its very being. The antimilitary saw, "Generals are always fighting the last war," often did not apply to the Air Force. From Billy Mitchell's predictions, through the 1950s bomber generals' assertions, and on to the CAS plane debate, the Air Force leadership often seemed ready to affirm a vision of the warfighting future based upon technological enthusiasm. To be fair, disciples of the Army's AirLand Battle doctrine and attack helicopters abetted the airmen's claim in the CAS plane case. Also, the service itself was the combat derivation of aviation technology. However, as with their contentions about modern air defenses, one had to wonder if the Air Force people really knew what they were talking about. True, there were examples from warfare history--the World War I Western Front, the World War II Italian campaign, and the Korean War truce talk period-where lines stabilized enough to be called "linear." Even then, they were certainly not straight or even that well defined at times. Detailed study of most other battles from the past--whether one cited the American Civil War, World War II, or Vietnam-defied anyone's capacity to describe an orderly, linear battle line. This was why CAS had always been so hard; determining friend from foe in the frantic maneuvering for combat advantage required positive coordination. Finally, both the Air Force and Army were once again guilty of asserting a warfighting vision which ignored the lesser conflicts more commonly seen since World War II-especially those happening all around them during the

<sup>51)</sup> plane; and that it could at least still serve in low-intensity conflicts. The F-16 also required better runways, which limited its utility. See MAJ Roger Kropf, USAF, "MR Letters," <u>Military Review</u> 69 (October 1989): 90.

Both Kropf and this work are sources for the fact that Carlson makes several misleading assertions about Korean War CAS. He claims that F-51s suffered higher attrition while jet F-80s and F-84s carried more bombs and flew more sorties. While these claims may be so, they ignore the fact that the F-51's popularity with the Army, as well as its long loiter time, meant that it was exposed to enemy fire longer. It was also not a rugged plane. Carlson also omits the fact that the jets' basing and fuel requirements made them virtually useless for CAS in the war's early days. Finally, he states that these particular jets often switched to the air superiority role. The Americans' air superiority plane was the F-86, not these attack jets.

1980s. One had to wonder if either service's leaders remembered their predecessors' outlook during the 1950s.<sup>43</sup>

Perhaps the most overt assertions during the late 1980s came via the TAC commander, General Russ, and the service's newspaper, the Air Force Times. Russ published in two different defense journals his assurance that the F-16 was the best CAS plane choice and that the Air Force would always meet its CAS commitment to the Army. In July 1988, he raised his own stakes in an Air Force Magazine article entitled "No Sitting Ducks." There was no talk now of an A-10/F-16 team; his article extolled the F-16 and condemned the Hog. Using five criteria for which to judge CAS planes-speed, maneuverability, electronic countermeasures, force packaging (the ability to keep up with "Gorilla" formations), and hit tolerance--Russ wrote that the most important factor was speed. Thus, concerning the modern battle arena, Russ asserted that "Slow ducks will be dead ducks." Others took the article for the sales job it was. Armed Forces Journal International opined that Russ gave General Dynamics, the F-16's maker, several pages of free advertising. Even Air Force officers wrote Air Force Magazine contesting the general's logic. In 1989, the Air Force Times issued a "Defense Trends" special section with articles touting the F-16 and the modified A-7 as the service's new CAS planes. One piece featured defense experts who averred that, in the "battlefield of the future," interdiction would supersede fixed-wing CAS. Army firepower would do "CAS" and the jets would do interdiction. Another article openly stated that many Air Force leaders

<sup>&</sup>lt;sup>43</sup>Sources for this are the ones cited elsewhere for passages describing AirLand Battle and F-16 enthusiasm; see also MGEN Perry Smith, USAF (ret.), "Air Battle 2000 in the NATO Alliance: Exploiting Conceptual and Technological Advances," <u>Air Power</u> <u>Journal</u> 1 (Winter 1987-1988): 4-15 (foresees the A-10 replacement as a remotely piloted vehicle [RPV]; this may yet come to pass, though this author wonders how a machine will discern which troops in contact to shoot, when human eyes have enough trouble already).

Concerning the "fluid" battlefield, air support figured prominently in Vietnam; and one could describe both its 1960s insurgent phase and 1972 conventional war phase as chaotic battle environments with no "linear" fronts. One could even cite the Civil War Battle of Gettysburg as an historical example of combat campaigns' situational chaos. The battle's first day found the South's forces converging on the North's army from west and northeast. The Northern Army approached the battlefield from the south. Meanwhile, a large Southern cavalry unit operated behind Northern lines to the east.

detested the A-10 from the start; and finally, yet another spelled out how the F-16's new avionics modifications would help it do CAS.<sup>44</sup>

The service attempted to bolster its case with proof, which it derived from a variety of sources. As early as 1986, RAND tactical air warfare analyst Benjamin Lambeth announced the end of single-purpose planes due to rising tactical jet costs. Reputable officers at Air University wrote papers declaring the end of traditional CAS and hailing the CAS F-16. These followed the same line of arguments as the articles, though former-A-10 pilot authors qualified their F-16 support somewhat. And while his work was not specifically about CAS or its planes, Air Force Colonel John Warden's acclaimed airpower treatise, <u>The Air Campaign</u>, contributed to the Air Force's air superiority and interdiction bent. Interestingly, Warden illustrated close air support's significance. For offensive ground support, he gave such examples as the 1940 German Ardennes Offensive and the Americans' World War II amphibious operations. He also cited defensive support cases such as the World War II Battle of Kursk and the Vietnam War Battle of Khe Sanh.

<sup>&</sup>lt;sup>44</sup>GEN Russ' publication efforts are in: "The Air Force, the Army, and the Battlefield of the 1990s," 12-17; "An Open Letter on Tacair Support," <u>Armor</u> 97 (May-June 1988): 45; and "No Sitting Ducks," <u>AFM</u> 71 (July 1988): 92-97.

The rebuttals to Russ' "No Sitting Ducks" piece are: "Darts: General Robert D. Russ," <u>AFJI</u> 124 (August 1988): 95; and the following three "Airmail" writers to the editor in <u>AFM</u> 71 (September 1988): 17-18: MAJ Charles Brown, USAF; Ed Flynn, and LTCOL William Haynes, USAF (ret.). LTCOL Haynes pointed out that Russ' graph showing better turning ability for the F-16 versus the A-10 had skewed premises; Haynes believed that better stand-off weaponry would aid CAS survival, not high speed. MAJ Brown seconded Haynes, and also questioned how well a fast plane would handle poor weather CAS. Flynn brought up the targeting improvements required to make CAS easier and more effective.

In his interview with the author, Russ said that he could not recall the articles, but added that these were often ghostwritten and disseminated as general policy statements.

The "Defense Trends" special section appeared in the <u>Air Force Times</u> 25 September 1989 edition, and contained the following articles, all by staff writer David Fulghum: "A-7F Makes Comeback," 6; "Doubts Cast on AF Role," 2-3, 11 ("battlefield of the future," 2); "Looking for an F-16 Edge," 12-13, 15; "Radar-Killing Missile Offers Strategic Options," 14; and "Software Guides Pilots Through Air Defenses," 5. Of these, the "Doubts Cast on AF Role" article featured the most assertive claims that fixed-wing CAS was finished as a mission.

However, as other military scholars later observed, Warden's prescriptions sought victory only through airpower via an air superiority and interdiction target priority matrix. He only considered conventional war operations, and did not believe America would fight smaller wars such as insurgencies.<sup>45</sup>

Noted military aviation historian Richard Hallion supplied perhaps the most remarkable of the academic efforts supporting the Air Force case. Hallion had served in various Air Force unit historian positions as well as Curator at the National Air and Space Museum. He also wrote prolifically, and the late 1980s found him serving as a visiting professor of military history at the Army's Military History Institute at Carlisle Barracks, Pennsylvania. Seizing the chance to study how airpower interacted with the Army, he conducted extensive research both at the Carlisle Barracks and Air University archives. Work at the latter led him to Lieutenant Colonel Bingham and other fighter interdiction proponents. Their influence showed in Hallion's ensuing book, <u>Strike from the Sky: The History of Battlefield Air Attack, 1911-1945</u>, as well as his <u>Air Power Journal</u> article, "Battlefield Air Support: A Retrospective Assessment," produced in 1989 and 1990, respectively. Though Hallion's book covered air support through World War II, he included a set of maxims--he called them "points"--which addressed what he derived from

<sup>&</sup>lt;sup>45</sup>Significant among Air University student works supporting the service's view are LTCOL Harold Gonzales, USAF, "Tactical Air Support of Ground Forces in the Future" (MAFB: Air University Press, 1990); COL Melvin "Smoky" Greene, USAF, "Close Air Support: Proud Past, Uncertain Future" (Research report, Air War College, 1988); and Hinds, "Replacing the A-10." Gonzales, an F-16 pilot, unreservedly presents the Air Force view. Former A-10 squadron commanders Greene and Hinds concede that the A-10 was not suited for the interdiction missions required by AirLand Battle, but point out the F-16's weaknesses for CAS. Hinds wants a mix of A-10s and F-16s.

For Warden's impact and CAS commentary, see Dennis Drew, "U.S. Airpower Theory and the Insurgent Challenge: A Short Journey to Confusion," <u>The Journal of</u> <u>Military History</u> 62 (October 1998): 828-829; COL John Warden, III, USAF, "Close Air Support," chap. in <u>The Air Campaign: Planning for Combat</u> (Washington, D.C.: Pergamon Brassey's, 1989), 86-97; and Winton, "Partnership and Tension," 113-114. Winton believes that Warden's book was symptomatic of a growing rift between the services, since Warden pushed a vision of the Air Force operating independently of the Army. Drew mentions that Warden scarcely considered low-intensity conflict in his book.

his study of air support as it was accomplished up through the mid 1980s. These formed the substance of the article.<sup>46</sup>

Some had merit. Hallion described the difficulties involved with conducting N/AW CAS. He also noted that air attacks upon troops had psychological value, that air defenses were increasingly tougher, that CAS and BAI had tremendous synergistic value, and that good communications were essential to CAS success. He also frequently overstated his case. While discussing the rising air defense threat, he asserted that the SA-7 drove the A-1 from the skies over South Vietnam. The SA-7 certainly was a serious threat, but A-1s continued to operate. He used the word "always" to assert some conclusions: BAI always yielded more results than CAS, and multirole fighters always performed better in the CAS/BAI role than special-purpose attack planes. He cited only a few historical instances where CAS was decisive, and then proclaimed that it was a mission "which typically reflects more desperate or peculiar circumstances." Warden provided better examples supporting CAS' value, and he was no air support fan. Hallion also did not mention the AirLand Battle doctrine which pushed this line of thinking about air support.<sup>47</sup>

<sup>&</sup>lt;sup>46</sup>Hallion, "Battlefield Air Support: A Retrospective Assessment," 8-28; and Hallion, <u>Strike from the Sky</u>, xviii-xx (Hallion describes his research efforts on these pages; while at Edwards Air Force Base, he even got to ride in an F-16--one wonders if his assessment would have changed if there had been two-seat A-10s available for him to ride); and LTCOL Charles Westenhoff, USAF, "Net Assessment," review of <u>Strike from</u> <u>the Sky</u>, by Richard Hallion, in <u>Air Power Journal</u> 4 (Winter 1990): 88-89.

Westenhoff describes the book as a gold mine of sources for any CAS scholar. He also observes that Hallion's writing and sources can be used to argue any side of the CAS debate. However, Westenhoff does not criticize how Hallion, after writing a book addressing air support up through World War II, can then make conclusions for air support conducted after that war.

<sup>&</sup>lt;sup>47</sup>Hallion, "Assessment," 11 ("always" assertion about BAI), 12 (quote), 15, 17-18, 19 ("always" assertion about fighter-bomber), 22; Hallion, <u>Strike</u>, 263 ("always assertion about BAI superiority to CAS), 264 ("always" quote about fighter-bomber superiority to attack plane), 265, 268-269; and Westenhoff, "Net Assessment," 89.

Remarkably, Westenhoff does not mention Hallion's sweeping assertions, and even claims that "Hallion does not imply that he has simple, clear, ironclad answers."

One could perhaps understand Hallion's multirole fighter bent had he stuck to World War II's P-47s and P-51s, but he extended his judgment favoring these planes to events through the 1980s. In so doing, he dismissed the A-1, whose Vietnam CAS performance upstaged the jet fighters and helped inspire the A-10. Indeed, a former Vietnam War FAC reproved him in a letter to <u>Air Power Journal</u>: "The ubiquitous F-4 was the last airplane I really wanted to see for a CAS mission. Any aircraft in the attack category was better." He also forgot the A-4, which for decades served both the U.S. and Israel, in spite of the latter's disdain for CAS. Hallion also mixed up facts. Recalling many Air Force leaders' impression of the A-10's genesis, he wrote that the Air Force purchased the A-10 due to congressional pressure—the Army's Cheyenne helicopter was the more pressing influence. In his account, the A-10 was a replacement for the A-7; but the service purchased the two planes as complementary attack machines. (Indeed, the A-7 was another attack plane which accomplished CAS and interdiction missions for the U.S. Navy through the 1991 Persian Gulf War.) The Su-25 was not a "mirror-image" of the A-10, as Hallion stated.<sup>48</sup>

Hallion specifically dismissed the A-10 and other attack planes as "potential enemy ace makers," unable to survive "in a high-intensity war characterized by multiple air-to-air and ground-to-air threats." Thus, he insisted to readers that "the best aircraft for the contemporary tactical air support mission is the genuine fighter-bomber, such as the General Dynamics F-16 and McDonnell-Douglas F/A-18." He supplied no historical background to support this, at least for conflicts after World War II. After all, most of those wars were the low-intensity fights whose lessons he dismissed. Further, the Israelis used fighter-bombers for CAS during the one recent conflict--the Yom Kippur

<sup>&</sup>lt;sup>48</sup>Hallion, "Assessment," 20; and Hallion, <u>Strike</u>, 266, 267 ("mirror image" quote). Hallion also asserts that the U.S. "abrogated its lead in helicopter development" (<u>Strike</u>, 267) to the Russians; and considers the Apache--whose development commenced in the early 1970s--as a "long overdue response to this growing Soviet capability" (<u>Strike</u>, 267).

The letter quote is from LTCOL Raymond Hain III, USAFR, "Letters, CAS/BAI Aircraft Selection," <u>Air Power Journal</u> 4 (Fall 1990): 7.

War--approaching his high-intensity warfare criterion, and they did not do so well either. P-47s and P-51s flew air support successfully in World War II, but their top speed was less than that of the A-10 that he now condemned. Thus, they were not so fast as to seriously hinder target acquisition; and as the F-51 demonstrated in the Korean War, they were also more maneuverable than the jets of *that* era. He also apparently overlooked the fact that older or slower American planes like the P-40 and the SBD Dauntless did well in attack roles during World War II. This was because fighters dedicated to air superiority first achieved their own mission, which then allowed fighters and attack planes *dedicated to air support* to achieve theirs.<sup>49</sup>

Finally, the Air Force sought support by publicizing the results of certain flight tests. The service planned future modifications for its CAS F-16s, such as hardening of certain vulnerable areas, inclusion of a detachable 30 mm gun pod, and incorporation of night infrared capability. In the meantime, the service immediately procured for evaluation the equipment that it hoped would answer skepticism about the fast fighter's ability to acquire and hit CAS targets. The first item was a digital terrain monitor which guaranteed precise navigational system accuracy, and the second was a data link system, called ATHS (Automatic Target Hand-off System), which allowed ground parties to transmit CAS target information instantaneously to the F-16's weapons computer and cockpit head-up display. Remembering how JAWS and TASVAL quelled skepticism about A-10 and helicopter survivability during high-threat CAS, General Russ ordered a demonstration test of these avionics systems which ran from late-summer 1998 through late 1989. (By the time the program finished, the Air Force had also tested other equipment on the F-16, to include laser spot trackers, a new radar, a cockpit map display showing the plane's location, and

<sup>&</sup>lt;sup>49</sup>Hallion, "Assessment," 20 ("ace maker" and "high-intensity war" quotes), 22 ("CAS/BAI experience from limited wars has only limited relevancy to high-intensity conflict. This observation . . . is actually a subsidiary conclusion of a larger one: limited wars can have but limited relevancy to larger and more intense conflicts."); and Hallion, <u>Strike</u>, 266, 267.

infrared gear.) To further secure credibility, the pilots flying the demonstration were mostly ex-Hog Drivers who later transitioned to the F-16.<sup>50</sup>

Staged at various locations, the test's objectives mostly addressed the F-16 pilots' ability to use the new avionics to acquire and hit targets on the first pass. A draft report of the portion flown at the Nellis ranges stated that it went well. At least according to defense press reports, the portion flown at Fort Hood, Texas, earned praise from Army helicopter pilots formerly skeptical of F-16 CAS. Shortly afterwards, Air Force Chief Welch and Army Chief Vuono jointly stated that "We should therefore proceed to deliver some part of the F-16 buy in the A-16 configuration." However, at least one staff officer later commented upon its staged aspect; and as one F-16 pilot noted, these sophisticated systems required a lot of effort to work. The implication was that, without them, the F-16 would not do CAS well at all. (No one discussed the continued need for verbal communications to prevent fratricide due to ATHS keypunch error, mechanical malfunction, or enemy radio intrusion.) Indeed, one had to wonder how these features might further improve the A-10's effectiveness. But alas, the A-10 was then considered a nonplayer for future air support. By mid 1990, the Air Force had only just commenced a tentative and much less

<sup>50</sup>"AFTI F-16 Testbed to Evaluate Sensors for Close Air Support," <u>AW&ST</u> 127 (2 November 1987): 76; Anonymous interviewee "C," telephonic interview by author; Joe Bill Dryden, "Design Philosophy Comparisons," <u>Code One</u> (January 1989): 22-23 (General Dynamics' F-16 newsmagazine; Dryden was Senior Test Pilot); Thomas Frey, "F-16 Fighting Falcon Upgraded Cockpit," (Fort Worth, Tex.: General Dynamics, n.d.); 1-70; Russ, interview by author; and Brian Wanstall, "Squabbles over Warthog Successor," <u>Interavia Aerospace Review</u> (February 1990): 151-155 (mostly a gee-whiz description of F-16 modifications); and Yates, interview by author.

Yates believed that if the F-16 used the new target acquisition technology, it flew CAS well enough to *complement* other planes flying the mission.

The digital terrain system for the F-16 was similar to that used on cruise missiles to update their inertial navigation systems; see Ulsamer, "New Roadmap," 113.

Anonymous "C" was an Air Force Pentagon staffer who worked CAS plane issues during this time. He claimed that he and other staffers pushed the Air Force and TAC to test the F-16 with the latest equipment to prove the plane's CAS credibility (this does not square with GEN Russ' recollection that he thought up the test as something similar to JAWS and TASVAL). "C" also said that the Nellis test unit wanted to do the test with its own F-16 pilots, but that he went to his superiors and proposed the former A-10 pilot setup for credibility purposes.

publicized evaluation of a couple of these systems on the Hog-and this with funds left over from another project.<sup>51</sup>

<sup>51</sup>"A-16 CAS Demonstration Project Plan, Introduction" 57 FWW (Fighter Weapons Wing) draft copy, n.d., in author's possession (test objective emphasis is on acquiring and hitting targets); Anonymous "C," interview by author; Chaleff, interview by author (A-10 funding); Natalie Crawford, telephonic interview by author, 28 May 1997, notes in author's possession (RAND tactical air support analyst); "F-16/A-16 Close Air Support Demonstration, Final Report," 57 FWW draft copy (Nellis phase; statistical results omitted for security), n.d., in author's possession (covers part of test conducted at Nellis AFB; high praise for the F-16); Paul Farmer, personal interview by author, 2 May 1997, The Pentagon, notes in author's possession (OSD Project Analysis & Evaluation [PA&E] staffer); "Grumman, Rockwell Team to Bid on A-10 Upgrade," Defense News, 8 May 1989, 19 (brief mention that the Air Force plans to incorporate Global Positioning System [GPS] satellite reception into the A-10); Headquarters Air Force, "PMD [Program Management Directivel for Class II Modification for A/OA-10 Technology Demonstrator Program," 1 December 1989, in author's possession (specifies modifications for upcoming A-10 avionics test); Hennigar, interview by author (A-10 test project office chief at Nellis; noted that F-16 test results seemed pre-ordained); MAJ Albert Phillips, USAF, "The Integration of the F-16 into the Close Air Support Environment," report submitted to 57 FWW Test Directorate and Fighter Weapons School, May 1989, in author's possession (F-16 pilot who noted the importance of the new avionics to F-16 CAS success); Jeffrey Rhodes, "Close Support Test Bed," AFM 73 (April 1990): 56-59 (lists all of the CAS avionics modifications under study; insists that they are not only for the F-16); Russ, interview by author; Carole Shifrin, "TAC Demonstration Bolsters Support for F-16 in CAS Role," AW&ST 130 (17 April 1989): 49-50 (Fort Hood test; more praise and Vuono/Welch quote, 49); William B. Scott, "AFTI F-16 Completes CAS Test, Demonstration Phase," AW&ST 132 (2 April 1990): 38-40 (later test equipment--the service planned even more additions after the test, to include GPS reception and a mission planning computer); Joe Stout, "CAS: Close Air Support Role," Code One (January 1989): 24-27; "USAF to Begin Evaluating FLIR Candidates for A-10," AW&ST 132 (30 April 1990): 47 (half-page piece); and Yates, interview by author.

The <u>AW&ST</u> and <u>Defense News</u> articles about A-10 equipment testing and upgrade comprised the total defense press information that this author found on A-10 modifications. The <u>AW&ST</u> article mentions that the Nellis test unit will evaluate various night-vision devices and ATHS.

The PMD mentions that the A-10 night vision devices included both FLIR and night-vision goggles. Though the service publicly seemed certain that this equipment helped the F-16, its A-10 demonstration test PMD seemed tentative, saying that the evaluation would determine if "potentially any [of these systems] may apply to either the CAS or the FAC mission."

Anonymous "C" claimed that one month before the test began, he came across an already-written test report praising the F-16's performance. He went to his superiors and

Along these same lines, the service upgraded the New York Air National Guard's A-10 squadron at Syracuse to F-16s in late 1988. As part of 174th Tactical Fighter Wing (TFW), a dedicated CAS Guard unit flying A-10s, the Syracuse squadron had a reputation for initiative, as well as pride in the Hog and its mission. Indeed, the unit had instigated a number of A-10 weapons modifications which the regular Air Force then incorporated into its Hogs. Thus, the Air Force saw the 174th, and especially its Syracuse squadron, as the best venue for operationally demonstrating the F-16's worth. According to an Aviation Week & Space Technology feature article in June 1990, the F-16 did well, though some of the former Warthog pilots' quotes sounded unusual. They declared that they were not concerned about the F-16's lack of armor, because its speed allowed them to avoid hits. They also said that they liked the versatility that the plane gave them, and added that it was maneuverable enough to allow one to hit targets which suddenly appeared on an attack run. Though the 174th's F-16s had not received the equipment used in the demonstration, the plane's other features seemed to impress the pilots. The 174th's commander, Brigadier General Mike Hall, enthusiastically declared the F-16's air-to-air radar a necessity for CAS missions (though he also emphasized that he would use it only to maintain tactical situational awareness). Finally, they boasted about the heavy weapons load that they could carry, including an as-yet-to-be-distributed 30 mm gun pod, but did not do so for the Aviation Week reporter they took along on some of their missions. Though it was much smaller and carried far less ammunition than the A-10's GAU-8A, the gun pod was something which the Air Force felt compelled to include for the CAS F-16, since it enhanced the fighter's "tank buster" image relative to the A-10. The Aviation Week article asserted its tank-killing power out to twelve thousand feet slant range, though no one

had it quashed. Crawford attended a demonstration during the Fort Hood and was impressed. Russ and Yates also claimed that it went well. Farmer and Hennigar believed that it had staged qualities.

claimed such a capability for the slightly more powerful GAU-8A. Indeed, A-10 critics were already proclaiming the GAU-8A's obsolescence against newer Soviet tanks.<sup>52</sup>

## Debate: The F-16 Opponents

The opponents set themselves against such claims for the F-16's CAS prowess, though they never mustered anything like the Air Force's public relations effort. Further, their own CAS preferences diverged. Other than articles describing their efforts, the odd editorial, and their own occasional article, their voices remained disparate shouts that never reached a crescendo. The most visible figure was CASMARG chairman Fredericksen, who opposed the F-16 mostly on the plane's specific weaknesses in performing CAS.

Fredericksen gamely expressed his views at an Air Force Association Symposium in late 1987. "I love the F-16 as a fighter . . . . I just think it's too soft an airplane for CAS," he said, pointing out that the diminutive fighter's vulnerability to the Soviets' 23 mm AAA was nine times that of the A-10. He continued,

If you can do CAS without getting in close, that's one thing. But I don't think you can. The good guys won't call you unless they're getting overrun, and you've got to know exactly where they are. You've got to worry about fratricide. So you've got to get down in there, and you're going to take an awful lot of fire.

<sup>&</sup>lt;sup>52</sup>Chaleff, interview by author; David Fulghum, "Air Force Is Equipping F-16 Squadron with a 30mm Antitank Weapon," <u>Defense News</u>, 19 June 1989, 24; David Hughes, "Syracuse Wing Finds F-16A Effective in Close Air Support," <u>AW&ST</u> 132 (18 June 1990): 36-42; Dan Kuebler, telephonic interview by author, 30 May 1997, notes in author's possession; "Special Avionics, Weapons Needed for F-16s in CAS Role," <u>AW&ST</u> 132 (18 June 1990): 43; Otis, interview by author; Pentland, interview by author; Spinney, interview by author (observed that Hall was a commander with a can-do reputation); COL Charles Stenner, USAFR, telephonic interview by author, 30 May 1990, notes in author's possession; and Yates, interview by author.

Chaleff, Kuebler, Stenner, and the "Special Avionics" article all note the Syracuse unit's aggressive weapons work on behalf of the A-10. Chaleff and Stenner both served in staff positions in the Air National Guard/Air Force Reserve Test Center. Kuebler was a Syracuse A-10 pilot and GE employee.

Yates believed that using the Guard to fly the CAS F-16 was smart, due to its political clout.

Reflecting upon the normal CAS requirement for multiple target runs to better assist friendly troops, Fredericksen observed that even a fast CAS jet would still "get its lunch eaten on the second or third pass."<sup>53</sup>

There was more Fredericksen could have said. He could have followed the defense reformer critique of too-expensive, too-ambitious weapons systems by pointing out that both the F-16 and its pilots labored under its multirole capabilities. He told an interviewer years later much the same thing, recalling that during the time of the debate, he visited an American F-16 base in Europe and found that the pilots did not consider CAS an F-16 mission (he did mention this in passing during congressional testimony). Even an Air Force liaison officer to the Army noticed the same thing; the F-16 CAS he saw indicated that the pilots' "hearts simply aren't in it." Indeed, an F-16 weapons officer told his fellow pilots in a 1990 Fighter Weapons Review article that F-16 CAS required more practice than they already accomplished. Otherwise, the result would be the usual problem of unprepared F-16 pilots fumbling through the procedures. A 1988 Air Force safety article attributed a high percentage of F-16 crashes to loss of situational awareness induced by such things as cockpit task saturation, distractions, and the plane's lack of aircraft attitude cues. Further, an Armed Forces Journal International rebuttal article to Russ' Air Force Magazine "No Sitting Ducks" piece enumerated the F-16's other CAS weaknesses. It pointed out that the plane could not carry a big weapons load, and what it could carry hurt its performance. The newer SAMs were so fast and maneuverable that the F-16's speed made no difference. Ability to travel with a strike force was irrelevant because strike forces were tailored for interdiction, not CAS.54

<sup>&</sup>lt;sup>53</sup>Fredericksen's comments are from Canan, "More Flak," 79. The Air Force generals--Chief of Staff Welch and TAC Vice Commander Brown-who also spoke contradicted the Deputy Under Secretary by praising the CAS F-16 and modified A-7.

<sup>&</sup>lt;sup>54</sup>Congress, Senate, <u>DoD Authorization, FY 89</u>, 53; LTCOL Gary Dikkers, USAF, "Overcoming Poor Attitude Is the Key to Effective CAS," <u>Air Force Times</u> 3 December 1990, 23, 61 ("hearts" quote, 61; Dikkers believes that the F-16's major CAS disadvantage is that it *can* do so many other missions; as a FAC, the F-16 CAS he has seen so far is poor); COL Robert Foglesong, USAF,"Defense Forum," <u>AFJI</u> 125 (November 1988): 7; Fredericksen, interview by author; Icarus (pseud.), "Choice of a New CAS Plane not a

However, Fredericksen was no longer sure that *any* plane could do the mission. He was especially impressed by the new shoulder-launched SAM technology demonstrated by the Stinger. He expressed his serious concerns about this type of missile in his Symposium speech. (In a later interview, he insisted that this was a threat which overcame all countermeasures, to include both speed and decoy flares.) As a result, he was unsure if fixed-wing close air support could ever be "close" again. He observed that the Israelis were doing the mission with helicopters, and then added, "I'm not ready to do that. But we have a problem."<sup>55</sup>

However, Fredericksen did push for other options, with one of them being a new dedicated CAS plane. Though contractor skepticism about the Air Force's desire for such

CAPT Loida's article describes F-16 CAS procedures and asks F-16 pilots not to follow the "the old equation of "Viper + CAS = Four Alarm Helmet Fire [fighter pilot slang for complete overtasking]." And a spoof aircraft motto sheet supplied to the author by LTCOL Thomas J. McGrath, USAF (ret.) reveals that the F-16's vulnerabilities generated their own set of jokes. One read: "We've spent so much money on this thing we can't afford to admit we were wrong." There was also "Careful bad guys ... I'm carrying BOTH bombs today!" Or, "If I carried more weapons, and if I had enough gas .... I'd really teach you a lesson!" And one parting shot: "We cover the target like a thong bikini!"

<sup>55</sup>Fredericksen, cited in Canan, "More Flak," 79; and Fredericksen, interview by author. Fredericksen anonymously expressed his views in "Issues in Close Air Support," in <u>Selected Papers</u> (McLean, Va.: Hicks & Associates, 1996), 108-109, 112-113. Indeed, "Issues" expresses the premise that other weapons systems--helicopters and guided missiles, and RPVs--will assume the aviation fire support role, and that American forces will not face situations requiring CAS. The latter assertion comes remarkably after the Mogadishu, Somalia firefight and NATO's use of air attacks on enemy ground forces in Bosnia.

Simple Matter," <u>AFJI</u> 125 (September 1988): 114-116; CAPT Mike Loida, USAF, "The Viper [fighter pilot slang term for the F-16] and High Threat Close Air Support," <u>FWR</u> (Fall 1990): 14; LTCOL Geoffrey McCarthy, USAF, "Human Factors in F-16 Mishaps," <u>USAF Flying Safety Magazine</u> 44 (May 1988): 17-219 (McCarthy was a flight surgeon who also flew F-16s); and Russ, interview by author.

All of the Fighter Mafia/Defense Reformer people interviewed for this work--Christie, Myers, Fredericksen, Spinney, and Sprey--denied being Icarus or knowing who he was. Foglesong's letter rebutted Icarus, but inserted implications into the critic's words which this author did not see. Icarus did not denigrate the air-to-air mission, nor did he say that he wanted to fly alone in the battle area, as Foglesong asserts.

a plane hobbled Fredericksen's effort, there was one Fighter Mafia veteran who publicly pushed a new design. Chuck Myers not only attacked the Air Force position in a letter to <u>Air Force Magazine</u>, he also proposed a very simple CAS plane, which he called the "Mud Fighter," in a March 1987 article for <u>Armed Forces Journal International</u>. Noting that one of the most important A-10 contributions was a an airplane and pilot cadre dedicated to CAS, Myers proposed a smaller, simpler plane with a high subsonic speed. In effect, the revived "Blitzfighter" idea from the late 1970s. The plane would still maneuver well at both low and high speeds, and possess STOL capability. Several months later, innovative aircraft designer Elbert Rutan proposed such a machine. He was the only designer or corporation to respond seriously to Fredericksen's call for a dedicated CAS plane design.<sup>56</sup>

This last item was mostly due to the Air Force's obvious unwillingness to consider a new plane instead of the F-16. However, Myers' design concept was also too simple. (One must recall that he also supported Lindsay and Helms' Enforcer proposal.) He and some other Fighter Mafia people wanted a single-engine plane armed only with a gun and rockets--and which carried almost no avionics or defense countermeasures gear. Further, the design's planned ordnance load was too wedded to antitank warfare and not to other contingencies. This was unlike the A-10, which carried a variety of weapons, countermeasures equipment, and was big enough to accept equipment modifications. Myers asserted the Mud Fighter's simplicity and low cost allowed the U.S. to produce a "war relevant force of thousands--with a back-up force of equal depth to be held in a war reserve . . . status." Thus, simple, low-cost Mud Fighters would swarm over the battlefield, and their losses would be easier to endure than for other tactical planes. Myers

<sup>&</sup>lt;sup>56</sup>Burton, <u>Pentagon Wars</u>, 57-60, 61, 68, 99-101; "Close Air Charade," <u>AW&ST</u> 128 (28 March 1988): 9 (editorial scoring the Air Force for not seriously considering proposals for dedicated CAS plane); Myers, "Air Support for Army Maneuver Forces," 46-47; Chuck Myers, "Airmail, The AirLand Battle," <u>AFM</u> 71 (June 1988): 9; Chuck Myers, personal interview by author, 1 May 1997, Alexandria, VA, notes in author's possession; William Scott, "Rutan's Scaled Composites to Develop Close Support Aircraft, Business Jet," <u>AW&ST</u> 129 (21 November 1988): 27; and the following previously cited interviews by author: Fredericksen and Spinney.

declared that "in 1944, we coupled off-the-shelf technology with off-the-shelf people flying P-47s and P-51s to support Army maneuver forces."<sup>57</sup>

Myers' vision allowed some of the CAS F-16 defenders to contend in their articles that any dedicated CAS plane was a poor competitor to the CAS F-16; and even some reformers opposed it as too simple. Major General Gorton observed that its design was too limited to antitank air support. Both he and Colonel Carlson not only questioned whether any modern tactical warplane could ever meet cost and development timeline goals, but also asked how the Air Force would support the operating and maintenance costs for such large numbers of planes and pilots. Though CASMARG Chairman Fredericksen wanted a CAS plane smaller than the A-10, he thought that Myer's Mud Fighter possessed too limited capability. OSD reformer Chuck Spinney seconded this opinion when he later opined that had Myers made the design slightly larger, it might have received a better reception. General Russ summarily dismissed the plan when Myers presented it to him. Russ especially disliked the disposable plane aspect, perceiving Myers' argument to be that "in World War II, a lot of guys bailed out. Some guys bailed out three and four times in a day. And I kind of said, 'Why should we do things like we did in World War II? We used to have horses too. Should we have horses?" Indeed, in later discussing the plane, Myers questioned why pilots should think that they could not suffer loss rates similar to those of the troops they supported. But his query conjured an issue involving CAS since World War I: pilot air support overcommitment which incurred unacceptable losses. Major General Gorton also attacked the Mud Fighter along this same line when he wrote: "I am

<sup>&</sup>lt;sup>57</sup>Myers, "Air Support," 47; and Fredericksen, Myers, Spinney, and Sprey, interviews by author. Myers added that the Mud Fighter could be a "very simple machine which exploits a weapon in a form that is easily employed by high school graduates" (47). Sprey said that the military reform movement pushed the Mud Fighter.

sure that lots of inexpensive, simple aircraft will need to be flown by lots of expensive, complex pilots."<sup>58</sup>

One had to expect losses in combat, especially in the dangerous CAS battle arena. But if an aircraft design emphasized not only ruggedness, as with the A-10, but also expendability, one had to remember the expensive and time-consuming training required to produce competent airmen. Heavy losses of these less-disposable pilots might end effective air support. The American emphasis upon firepower over lives that made CAS so compelling for troop support also applied to the pilots who flew it.

However, Myers could answer--and he said this in the Mud Fighter article--that he wanted the Army to get the plane. In this, he was like other F-16 opponents who saw the

<sup>58</sup>Carlson, "Close Air Support," 56-57; Gorton, "Mudfighters and Elephants," 106-107 (quote, 106); Myers, "Air Support," 46-47; Marconi von Spangenberg [George Spangenberg], "USAF's Fighter Mafia Needs a New Aircraft Design Philosophy," <u>AFJI</u> 123 (March 1986): 64-68; and the following previously cited interviews by author: Fredericksen, Myers, Russ (quote), and Spinney.

Fredericksen and Spinney remembered that both Myers and Rutan's design was too restricted in size and options; but even Fredericksen contemplated a design too limited to European anti-tank CAS. Fredericksen especially wanted a plane which could beat the heat-seeking, shoulder-launched missile threat.

Gorton rightly observes that, while ability to endure a hail of small arms fire is nice, modern air defenses also require expensive countermeasures gear on board tactical aircraft. However, this author believes that Gorton's "inexpensive planes, expensive pilots" statement refers to any inexpensive CAS plane, including the A-10, since his piece tries to convince readers of the F-16's worth.

Military aircraft designer Spangenberg-he served as the Navy's Bureau of Aeronautics Design Evaluator during the 1950s-does not attack the Mud Fighter specifically, but instead criticizes the Fighter Mafia for being out of step with military technology. Although he does not reveal his true name directly, Spangenberg gives enough obvious hints in the article's introduction. He wants the Fighter Mafia to pay more attention to the necessity of sophisticated electronics in combat aircraft.

Russ told this author: "I had Chuck Myers come down and brief me on it and I said, 'Chuck, before you leave here, I want... to make sure [of] one thing you do. I do not want you to go back and say 'I briefed General Russ and he didn't have any comments.' I want to tell you that I completely disagree with your entire concept... you're way off base... and I think it stinks!" Myers remembered that Russ called the Mud Fighter a "Mickey Mouse plane." This author points out that even if the pilots successfully escaped from their doomed Mud Fighters, parachuting in the midst of a battle area was not conducive to pilot survival either.

F-16 simply as the Air Force's desire to abdicate its CAS responsibility; and who thus proposed that some other service assume sole responsibility for the mission. An <u>Aviation</u> <u>Week</u> editorial expressed this view just after General Russ' 1987 F-16 announcement. Recalling how well the Marines provided their own in-house support with both helicopters and fixed-wing planes, former Marine A-4 aviator Brendan Greeley proposed that the Army assume the mission, "and if it decides some fixed wing assets are needed . . . so be it." The reader letters which addressed Greeley's piece wanted the Marines to assume the mission. Air Force defenders quickly pointed out the problems with these opinions. The Army did not have the funds available to support fixed-wing units; and its leaders asserted that they made their preference clear via the 31 Initiatives. The Marine-only CAS idea made little sense, given that the Marines' charter sharply differed from that of the other services. One also had to wonder how Marine aviation units could be diverted from supporting their own units to help some other service.<sup>59</sup>

Such positions as these reveal that the anti-F-16 side had its share of over-assertions or contested statements. One military reformer wrote for a military affairs review that "By 1989 the A-10s had been moved to the reserves." This may have been what the Air Force *planned* to do, but 1989 found nearly all active A-10 units intact. The worst example of

<sup>&</sup>lt;sup>59</sup>Bahnsen, interview by author; "Close Air Charade," <u>AW&ST</u> 128 (28 March 1988): 9 (another editorial criticizing Air Force's headlong pursuit of CAS F-16); Stephen Corley and Geoffrey Flanders, "Letters, Close Air Support," <u>AW&ST</u> 126 (20 April 1987): 84 (Marine CAS letters); Foglesong and Shirron, "Close Air Support: Its Background and Its Future," 34 (rebuts Army argument); Garrett, "Which Way Do We Go?" 37-39 (rebuts Marine and Army CAS argument); Gorton, "Of Mudfighters and Elephants," 107 (rebuttal to Marine CAS); Brendan Greeley, "Let the Army Fly Its Own Close Air Support," <u>AW&ST</u> 126 (9 February 1987): 11; Harrison, "The A-10: A Gift the Army Can't Afford," 36-39; Myers, "Air Support," 46-47; Myers, interview by author; and CAPT Scott Reynolds, USAF, "Letters, Close Air Support," <u>AW&ST</u> 126 (21 September 1987): 116 (rebuttal to Marine CAS letters).

Myers mentioned in the article, and also told General Russ in a briefing on the plane, that he thought its unit cost was much less than that of the Apache and guided missile artillery systems the Army was buying.

hyperbolic claims for the anti-Air Force side was a <u>Washington Monthly</u> piece by Robert Coram, an <u>Atlanta</u> magazine editor who had "written extensively on military affairs."<sup>60</sup>

Coram's piece was the nearest thing to an in-depth study of the debate by the mainstream, or "popular," press. Just as the popular press ignored previous CAS plane and mission controversies, it passed on this one as well. The CAS plane candidates' procurement money paled in comparison to more publicly recognizable defense controversies of the time, such as the B-2 Stealth Bomber or the "Star Wars" Strategic Defense Initiative. Nor did the debate have the obvious strategic import of these other defense programs. Indeed, the CAS argument was hard for the uninitiated to understand. Coram apparently decided to simplify it for <u>Washington Monthly</u> readers by following the popular press' usual simplistic assessment of military controversy, as given in such commonly heard swipes as: "military intelligence is an oxymoron," or "soldier boys and their weapons toys." Though one might agree with his theme that the service wrongly denigrated CAS, he marred it with his sarcasm, hyperbole, and incorrect assertions.<sup>61</sup>

<sup>61</sup>Coram, "The Case Against the Air Force," 17-24. Coram sarcastically comments on the Army's "Divad" anti-aircraft gun, saying that "it's so complicated nobody understands what it's supposed to do—so nobody can tell if it's working" (23). He calls <u>AW&ST</u> "the *Pravda* [italics in the original] of the defense industry" (24), even though that publication picked sides among differing defense views, as it did in the CAS plane debate. Disparaging the F-15, he states that it went into production "before Molly Ringwald entered grade school" (23). This analogy to the 1980s teenage movie actress helps define his audience, and the corresponding level at which he writes.

The only other mainstream press article that appeared in the debate is Anderson and Van Atta's "Air Force Plan Encounters Army Flak," in <u>The Washington Post</u>. In this quarter-page column, the investigative reporters give the impression that the Army opposes the CAS F-16 decision. As this work shows, some Army people opposed it, but others, particularly the leadership, supported it. Anderson and Van Atta refer to "sources in the Army" (E5), but leave it at that. Anderson and Van Atta also mentioned that total price for modifying F-16s to fly CAS was one-billion dollars. This author observes that this was less than the cost of *one* B-2 bomber.

The problem with reporters reducing the CAS issue into unrealistically neat

<sup>&</sup>lt;sup>60</sup>Robert Coram, "The Case Against the Air Force," <u>The Washington Monthly</u> (July-August 1987): 17 ("written extensively" quote); and Joseph Kruzel, "Perspectives," in <u>American Defense Annual, 1989-1990</u>, ed. Joseph Kruzel, (Lexington, Mass.: Lexington Books, 1989), 14 ("reserves" quote).

Coram indeed made errors. He asserted that the Air Force's neglect of CAS still "forced" the Army to buy attack helicopters. True, the airmen's 1950s apathy toward the mission caused an initial Army turn to helicopters. However, the ensuing helicopter combat performance, as well as the Army's own attack helicopter constituency, guaranteed that service's desire to pursue newer aircraft. Coram told the readers that subsonic design was the primary reason for dedicated CAS planes' low cost, but other factors such as avionics also determined a tactical plane's expense. Indeed, the original F-16 was a relatively cheap plane even though it was supersonic. Coram implied that the airmen did not want to do CAS because they would have to take orders from Army enlisted FACs; but FACs were nearly always other Air Force pilots or Army helicopter pilots. The most important FAC quality was speaking to the airmen in a manner which properly conveyed targeting information-poor communications often caused friendly casualties. He proclaimed that "From an institutional standpoint, the key element of deep strike is the Air Force's desire to avoid having to cooperate with its rival service." The service in part pursued strategic bombing as a means to justify its independence, but many Air Force officers vehemently insisted that interdiction justified its high priority because it yielded more results for the combat effort.<sup>62</sup>

morality tales is in a pro-Reform, pro-CAS article that appeared before the debate: Morton Halperin and David Halperin's "The Key West Key," <u>Foreign Policy</u> (Winter 1983/1984): 114-130. The Halperins use CAS as an example (118-120) of the problems inherited from the 1948 Key West roles-and-missions agreement. They erroneously claim that helicopters cost more and use more fuel than planes. The Cheyenne and Apache attack helicopters were embarrassingly expensive due to the capabilities that the Army wanted them to possess--not because of any intrinsically greater cost. The Cobra did not cost nearly so much. They misleadingly portray Congress as a body opposing the Air Force's attempts to cancel the A-10 early in its operational life. However, this work reveals that factions within Congress wanted the plane eliminated.

<sup>&</sup>lt;sup>62</sup>Ibid., 17-24 ("forced" quote, 18; and 'deep strike" quote, 18). The development of the FAC role depended on using qualified controllers, mainly pilots, who could understand the pilots' terminology and point-of-view. See the following essays in <u>Case</u> <u>Studies</u>, ed. Cooling: Wilt, "Sicily and Italy," 208-209; Jacobs, "Battle for France," 266; Taylor, "Southwest Pacific," 324-325; Millett, "Korea," 376-377 (the Air Force did not think that Army *officers* were competent to direct air strikes); and Sbrega, "Southeast

Coram also made some valid points. Like his positional opposite, Hallion, he observed that N/AW CAS was a very difficult and expensive task. He also pointed out that an F-16 could not carry the weapons load of an A-10, and that what external stores it could carry seriously taxed its otherwise nimble performance. Finally, he demonstrated that the service was historically infatuated with a high technology vision of future war while ignoring the prosaic but tactically important CAS mission, and that this fixation found it wanting in real conflicts. His delivery ruined the message.<sup>63</sup>

The one case where someone used a 1980s war to publicly advocate one side's position was noted aviation writer Jeff Ethell's 1987 <u>Armed Forces Journal International</u> commentary on the long-term fight between South Africa and the Angolan/Cuban alliance. Ethell claimed that the South African Air Force initially suffered unacceptable losses against the enemy's Soviet-supplied battlefield air defense equipment in the mid 1970s. However, it then developed an effective CAS operation using highly trained pilots, a smooth ground-air coordination system, and slower but rugged, well-armed, and highly maneuverable jets. Concluding his piece, Ethell rhetorically asked, "Are we listening or will we have to learn some very hard lessons all over again when the next conventional shooting war starts?" A reader attacked Ethell's in a letter response, pointing out that the South African airmen had recently taken more serious losses. They were also unable to influence the outcome of a recent protracted battle.<sup>64</sup>

The matter might remain an unresolved exchange, but some help comes via a South African who used personal interviews and archival research to recount the war's late 1987 to early-1988 final stage. The South Africans defeated the alliance, but its airmen used

Asia," 433-436. This author also refers to his interview with Colonel Deatrick, and how Deatrick's A-1 outfit took Army enlisted troops for air tours so they would be more competent controlling air strikes if the need arose.

<sup>&</sup>lt;sup>63</sup>Coram, "The Case Against the Air Force," 17-24.

<sup>&</sup>lt;sup>64</sup>Jeff Ethell, "Close Air Support, South African Style," <u>AFJI</u> 125 (September 1988): 97-100 (quote, 100); and Harold Foster, "Defense Forum," <u>AFJI</u> 125 (October 1988): 10.

conservative strategy and tactics; indeed, they conducted an aerial version of guerrilla warfare. The author, Helmoed-Römer Heitman, admitted that the clusters of Soviet-supplied AAA and SAMs made "traditional close air support impossible." (The South Africans performed CAS until this last stage of the war-apparently after Ethell's article.) Heitman declared that all air forces needed to re-evaluate this mission's usefulness. considering modern defenses. However, he painted a picture of airmen on both sides who, like the Soviets in the Afghanistan conflict's waning stages, did not fight a particularly hard-nosed air war. He mentioned up front that the South African Air Force conceded the skies to Angolan/Cuban MiGs, which "greatly restrict[ed] manoeuvre by the South Africans and saved . . . [enemy ground] forces from destruction on several occasions." Thus, South African troops saw little of their air force, whose air support consisted of occasional but well-planned BAI/interdiction missions by fast jet fighter-bombers. In fact, toward the end of his account, Heitman admitted that the "remarkable reluctance of the South Africans to accept casualties" was the reason the airmen were so cautious. And in spite of commanding the air against their foes, the Angolan/Cuban MiG pilots also did not aggressively attack South African troops due to their fear of AAA and SAM defenses, which in this case were not very intense. Heitman concluded that air forces could no longer operate unmolested in the skies; but his account did not apply to the air warfighting approach that either side of the American CAS plane debate contemplated.<sup>65</sup>

<sup>&</sup>lt;sup>65</sup>Helmoed-Römer Heitman, "Reflections: The Air War," chap. in his <u>War in</u> <u>Angola: The Final South African Phase</u> (n.p.: Ashanti Publishing, 1990), 310-330 (quotes: "impossible," 313; "greatly restrict," 310; and "remarkable," 328). Heitman's preface (no page references) contained acknowledgements and discussion of his sources.

The South African Air Force attack unit order of battle in Heitman's account was one squadron apiece of British-made Buccaneers and French-made Mirages. He writes that the airmen flew a few "CAS" missions against Angolan/Cuban frontline forces during this time, but these were pre-planned raids, not quick-response attacks. On page 319, he provides mission statistics which indicate that the two squadrons combined to produce an rough average of four combat sorties (one mission by one plane) per day--a not very intense air campaign.

Besides the fact that the war was in its final stages, neither side seemed to possess any effective countermeasures equipment for its planes-though Heitman mentioned that the South Africans used some. Nor were there any air defense suppression units on either

For all the opposition to the F-16, no one on this side of the debate gave much thought to keeping the A-10. After all, Don Fredericksen later said that what drove his CASMARG efforts were industry proposals for A-10 replacements, not A-10 modifications. Even Robert Coram opted for the Mud Fighter instead of keeping the A-10. One could say that General Russ showed more respect for the Hog when he singled it out for unfavorable comparison to the F-16 in his "No Sitting Ducks" article. In fact, articles occasionally surfaced describing A-10 potential for certain theaters. General Menetrey's Korea comments were one example, and a couple of articles promoting A-10 operations in a NATO defense of Norway comprised another. As the Cold War wound down in 1990, an Air Force A-10 Fighter Weapons School instructor, Captain Robert "Muck" Brown, pointed out in an Airpower Journal article that the A-10 would excel in post-Cold War low-intensity fights. But Army General Menetrey spoke as a theater commander, not as a military reform partisan pushing a procurement choice. One could only suspect that A-10 advocates wrote the Norway articles. And the Air Force seemed too enamored of Cold War-oriented, high-threat operations scenario to listen to Muck Brown. Indeed, one observer later claimed that, at the time, there was a strong rumor that all A-10s would be retired. The F-16 opponents also devoted little media effort to selling an upgraded A-10 option. Indeed, when Millard Barger wrote in 1986 about the Air Force's eagerness to support the interdiction requirements for AirLand Battle, he also noted that "Upgrading the A-10 is dismissed by almost all observers." Instead, this avenue remained within the domain of the bureaucratic and political maneuvering which formed the substance to the debate's "Sturm und Drang." Further, studies of one of the most desired modifications, increased engine thrust, revealed that more powerful engines brought much higher fuel consumption and corresponding reduction in loiter capability. Thus, A-10 advocates, or what there were of them in this debate, found themselves stuck between choosing between the long-esteemed CAS plane battle area loiter capability and

side. Thus, both sides' airmen used tactics which featured avoiding the air defenses as much as possible. The most active South African attack squadron's losses for this period were very low: 0.3%.

the siren call of higher performance. The one thing the debate did for the A-10 was call into question the Air Force's choice for its replacement.<sup>66</sup>

Along with the more serious maneuvering going on in the Pentagon and elsewhere, the dispute helped delay the Air Force's action until other factors ultimately guaranteed the A-10's redemption. Conversely, the debate also created a lot of confusion, as the disparate views about CAS fully surfaced. These revealed the shifting ground upon which the A-10 or any CAS plane rested. Thus, those who chose the F-16 could not be blamed for wanting a machine which could at least perform other missions if the air and ground forces decided CAS was unnecessary. This was certainly the case with the U.S. Air Force and Army during the 1980s, as both services' leaders contemplated a future war in Europe which excluded traditional CAS and the plane dedicated to it. Given the known and expected capabilities of current and future weapons on both sides of this imagined conflict, one can perhaps accept the leaders' choices as valid for the time that they occurred. Indeed, one could say that like CAS itself, the F-16's CAS avionics modifications represented yet another technological promise for troop support by fixed-wing planes.

However, there was no reason why these devices could not also apply to the plane dedicated to the traditional concept of this mission, which evidence from most 1980s wars indicated was by no means dead. The Americans at Grenada, the British at the Falklands,

<sup>&</sup>lt;sup>66</sup>Barger, "What the USAF Has to Do," 64; CAPT Robert Brown, USAF, "A Real Hog War: The A-10 in Low-Intensity Conflict," <u>Airpower Journal</u> 4 (Winter 1990): 54-66; Coram, "The Case Against the Air Force," 24; Craig Covault, "Alaskan A-10s Assume Growing Role in European, South Korean Defense," <u>AW&ST</u> 129 (18 July 1988): 47-51; Fredericksen, interview by author; David Fulghum, "Study Touts A-10 Wing for Norway's Defense," <u>Defense Trends</u>, 13 June 1988, 31; William Smallwood, "Old 'Hog,' New Tricks," <u>Air & Space</u> 13 (February March 1999): 24 (the rumor "observer"); COL Charles Stenner, USAFR, telephonic interview by author, 30 May 1997, notes in author's possession (Stenner was an A-10 pilot on the Air National Guard/ Air Force Reserve Test Center [AATC] staff, and recounted the problems with the A-10 engine modification).

Fulghum's piece cites a study by former A-10 pilot and ex-RAND research fellow, LTCOL James Terry, for proposing the A-10 as an excellent contribution to Norway's defense of a possible Soviet land assault. Fulghum also notes that the Norwegians were receptive.

and the Soviets in Afghanistan found the mission tactically useful. One could say that it was essential to the Soviets, for once their airmen decided not to contest areas defended by the Stinger missile, they eased the Afghan Rebels' path to victory. Unlike the anticipated European fight between NATO and Warsaw Pact forces, Afghanistan was a "low threat, low intensity" war-and yet it featured air defense weapons that shook even CAS plane proponents like Don Fredericksen. But the fact that the Russians encountered a defense system that they chose to avoid (for various reasons) did not eliminate the CAS mission's importance to their war effort. Nor did it mean that someone could not create tactics or countermeasures to beat the new defenses. As this account demonstrates, the debate could have continued indefinitely, but its complex nature at least served to undo the Air Force's attempt to quickly and quietly opt for interdiction-oriented air support. It created time for other circumstances to break the deadlock—if not among the advocates, then at least in the real world of weapons procurement and military action.

## CHAPTER IX THE BUREAUCRATIC WAR, THE POLITICAL WAR, AND THE REAL WAR, 1986-1991

As the CAS plane debate raged in the defense media throughout the late 1980s, the adversaries maneuvered against one another using other venues such as the official study group or sanctioned research study. First, there was Don Fredericksen's Close Air Support Mission Area Review Group (CASMARG), convened to ensure that the Air Force gave other designs besides the F-16 a fair hearing. Fredericksen and the CASMARG in turn allowed the Air Force to set up its own gathering, the Close Air Support Aircraft Design Alternatives (CASADA) study. Both sides then sanctioned many other studies. As with the debate, these efforts sometimes backfired against their sponsoring agency--the most prominent example being an Air Force Scientific Advisory Board (SAB) study which told the service that its best option was either a new dedicated CAS plane or at least a modified A-10. Though not quite as public as the free exchange of views then underway in the defense media, these actions still earned the occasional article.

Air Force staffers pointed out the CASMARG's dubious authority to tell the Air Force what planes to buy, and indeed, the service pressed forward with its plans. As the Cold War wound down and the defense budget started an ever more precipitous decline, Air Force leaders had a better case for multirole fighters due to its reduced force structure. Fredericksen realized all of this, and by 1990, had already started backing down. Most of the A-10 force faced early retirement, with the remaining planes slated for FAC operations mostly with the Air National Guard or Air Force Reserve.

However, the institutional war and the debate's noisy proceedings grabbed Congress' attention. The years 1989 and 1990 featured hearings which addressed the controversy either as part of normal budget deliberations, or in its own right. Spurred by Reformers in their own ranks or by a desire to promote a constituent's plane, Congress directed OSD and the Air Force to prepare a massive competitive test of various candidate machines. When the Air Force dawdled, Congress withheld F-16 funding until it showed more alacrity. Further, the lawmakers passed legislation directing a study of transferring A-10s to the Army.

The huge test and/or Army transfer might have come to pass except for other events. The defense budget descended to beneath what the Air Force wanted for its CAS F-16 plan, and facing both this and the congressional heat, it agreed to an OSD compromise featuring a mixed air support force of A-10s and F-16s (with only some of the previously planned CAS modifications). Second, the Iraqi invasion of Kuwait generated a large-scale U.S. mobilization, Operation Desert Shield, which called for using Hogs to stop any further Iraqi advance. The ensuing war, Operation Desert Storm, allowed Hog Drivers to demonstrate their plane's abilities.

Ironically, the Hogs did not fly that many CAS missions in the war. Instead, the coalition spent several weeks using air power to soften Iraqi forces before the ground war began. Due to the coalition's demand for a wide variety of air missions, the Hog flew everything from interdiction to reconnaissance to defense suppression. This was due to the air effort's success in stifling the most dangerous of the Iraqis' air defenses--the radar guided SAMs and AAA. (Granted, there was the odd radar SAM pot shot, and the regular unguided AAA remained a threat to everyone.) Hog Drivers encountered some difficulty with stiffer air resistance from the Iraqis' Republican Guards divisions, prompting more cautious tactics, but they were not the only ones who faced this or a similar situation elsewhere in the theater. Also, Hog Drivers found themselves using the Maverick more than the gun due to coalition air force minimum altitude restrictions which favored the missile's stand-off capability. Again, other jets such as the F-16 also faced this situation. The high attack altitudes that the coalition enforced to prevent needless losses affected its acclaimed bomb delivery accuracy. Another wartime irony came when the coalition's ground assault commenced. Army unit progress was so fast and the war ended so quickly that Hog Drivers had only occasional opportunities to demonstrate their CAS prowess.

The Warthog redeemed itself during this war, earning widespread praise. It proved its ruggedness, and Iraqi soldiers commented upon its ubiquitous presence and lethality. However, the assessments of the Hog's Desert Storm performance varied in quality from accounts which seemed to be Air Force advertisements for more high-technology weapons to studies which tried to render a fair verdict. The former downplayed the Hog's successes and did the reverse with its difficulties. Further, they ignored similar difficulties with other, more sophisticated planes. Later, more fair, accounts praised its unexpected versatility and well-known ruggedness. Between the force structure compromise and the Hog's wartime feats, the dedicated CAS plane remained alive.

## The Bureaucratic War

The CASMARG's formation in late 1986 and General Russ' ensuing announcement for the CAS F-16 sparked not only the public debate but also bureaucratic infighting. The latter struggle involved both the normal aircraft procurement agencies as well as the ones created specifically for this issue, making its retelling even more complex than the debate. Even so, the focal point during much of the organizational scrap was the CASMARG, whose membership besides Chairman Fredericksen included military reformer and OSD Program Analysis and Evaluation (PA&E) staffer Chuck Spinney (Paul Farmer replaced him in 1988), one general from the Joint Chiefs of Staff office, and the Air Force Pentagon representatives, Lieutenant Generals Jimmie V. Adams and John Loh (Lieutenant General Ron Yates replaced Loh in 1989). The Air Force men knew the mission and the planes: Loh had served under the legendary John Boyd during the F-16's genesis, while Adams had been TAC's action officer during the A-7/A-10 flyoff as well as an A-10 wing commander. However, this did not stop Adams and Loh from aggressively pursuing their service's point of view. Loh took the offensive at one of the CASMARG's first meetings, demanding studies of current threats and American operational concept requirements. Loh wanted these to support creation of a Mission Requirements Package (MRP), which would in turn help formulation of a new CAS plane design. The service apparently intended to re-create the same grounds which justified its F-16 choice.<sup>1</sup>

<sup>&</sup>lt;sup>1</sup>Farmer, Fredericksen, and Spinney, interviews by author. Fredericksen, as CASMARG Chairman, believed that Loh wanted to do an unbiased, professional job. Farmer and Spinney, who dealt with Loh from an equal (perhaps subordinate) position, thought that he made his pro-F-16 views quite clear.

The Air Force men also told Fredericksen that they wanted their own group to study alternative designs and produce the MRP, and the CASMARG Chairman let them do so. The resulting effort, called the Close Air Support Aircraft Design Alternatives (CASADA) study, submitted a draft MRP in autumn 1987, but the CASMARG rejected it as a "requirement for an F-16," as one OSD official put it. But there were many more studies; indeed, one congressional staffer involved in this scrap later counted nearly thirty between the late 1970s and 1990. Fredericksen had already sanctioned a study of the follow-on CAS plane issue by the Institute for Defense Analysis (IDA), a Washington Beltway defense think-tank. At about the same time that the CASMARG rejected the CASADA's MRP, IDA (this alphabet soup should reveal the dispute's soul crushing complexity) offered three design options, all of them favoring a lightweight dedicated CAS plane similar to Myers' Mud Fighter (Myers publicly proposed his version in March). In fact, John Morrocco's <u>Aviation Week</u> article announcing the IDA results featured a design drawing very similar to Myers' design, though Morrocco described the optimum IDA design as somewhat more substantial.<sup>2</sup>

Actually, the Air Force had commissioned a study by its Scientific Advisory Board (SAB) even before this period-back in 1985, when it first announced that it needed a new CAS plane. The SAB concept was a legacy of Army Air Force General Henry "Hap" Arnold and scientist Theodor von Karman's desire that the service map its force structure strategy via scientific means. However, an historian of the service's scientific organizations

<sup>&</sup>lt;sup>2</sup>Congress, House, <u>H.R. 4264</u>, 253-255, 312; Congress, Senate, <u>DoD</u> <u>Authorizations, FY 89, Pt. 4</u>, 56-57; "Defense Dept. Asks USAF to Broaden Design Options," <u>AW&ST</u>, 28-29 (quote, 28; also specifies IDA design options); Finley, <u>Replace</u> <u>the A-10</u>, GAO, 20-22; John D. Morrocco, "Study Supports Call for Design of New Close Air Support Aircraft," <u>AW&ST</u> 126 (28 September 1987): 29-30; Pentland, "Warfighting View," 96; Skip Ringo, telephonic interviews by author, 19 February and 28 April 1997, recording (28 April only) and notes in author's possession (the staffer who noted the proliferation of studies); and the following interviews by author: Fredericksen, Pentland, and Spinney.

The author notes the phonetic similarity between CASADA and Quesada (of World War II air support fame). This may be coincidence, but the Air Force staffers who conceived the title and associated acronym might have done this deliberately.

wrote that, by the 1980s, its charter had changed to organizing small-group studies of specific operational and technological issues. In this case, Air Force electronics/radar expert and retired Major General John Toomay supervised a seven-man committee which included both scientists and aviation business leaders. Using words that became more familiar during the imminent debate, the service's task statement for Toomay's SAB study stated that doctrinal changes and the European combat environment necessitated a review of CAS. Thus, it asserted that "the more fluid nature of the air-land battle blurs the distinction between close air support and battlefield air interdiction." As such, Toomay's SAB group was to assess future (1990s) military and technological factors so as to recommend the best interim and long-term planes and weapons for CAS.<sup>3</sup>

Like the 1987 Aerospace Symposium, the language suggested that Toomay and company should recommend the fast, interdiction-oriented fighter that the leadership wanted. They did not take the hint. First, they pointed out that in any CAS scenario, one had to assume air superiority and acceptable ground-to-air defense suppression before performing the CAS mission. Acceptable defense suppression for CAS meant that ground defenses could not be completely eliminated because one attacked soldiers with weapons. Further, the panel observed that the CAS and BAI missions required aircraft performance characteristics different enough to demand two different planes. It identified the traditional CAS characteristics, such as ruggedness, loiter capability, weapons carriage ability, and maneuverability, and then juxtaposed these against the interdiction requirements, such as speed, sophisticated stand-off weaponry, and all-weather capability. None of these latter items was either required or desired for CAS, because confirming which targets to hit on the chaotic battlefield required up close--read, visual--confirmation. The committee also scoffed at the idea that multirole planes were more cost-effective, for such planes would

<sup>&</sup>lt;sup>3</sup>A good history of the Air Force SAB is in Michael Gorn's <u>Harnessing the Genie:</u> <u>Science and Technology Forecasting for the Air Force, 1944-1986</u>, 2-9, 42-50, 131-136. Toomay's charter and observations about SABs are from "Report of the USAF Scientific Advisory Board Ad Hoc Committee on Close Air Support," (n.d.), A-1, A-2 (Toomay supplied his copy to this author, who in turn keeps a copy; henceforth, it shall be referred to as the SAB CAS Report); and MGEN John Toomay, USAF (ret.), telephonic interview by author, 5 March 1997, recording and notes in author's possession.

not execute the mission more efficiently. A European war would place critical demands on all air missions simultaneously (and thus require the best machines and pilots for each); and loss of expensive multi-role planes in the rough-and-tumble CAS combat world hurt the air effort more. Thus Toomay and his group recommended that the Air Force purchase a new dedicated CAS plane for the distant future and modify the A-10 with new avionics and better engines for the short term.<sup>4</sup>

Thus, this report affirmed the worth of a plane that players on both sides of the CAS plane squabble dismissed in favor of other designs. Though Toomay's SAB committee included the same Elbert Rutan who later submitted a Mud Fighter-type CAS plane proposal, the report specifically dismissed this concept by saying that the "mission should dictate the aircraft rather than vice versa." Indeed, one of the late 1970s "Blitzfighter" proponents who worked for then-active duty Major General Toomay observed that the general opposed such a plane because it was too simple. The report embarrassed the Air Force, and some sources later claimed that the service actively suppressed it. When asked about Toomay's SAB study years later, General Welch said that anyone who thought Toomay would not support the A-10 had not "read his resume." This was not fair to the other SAB committee members, for as Toomay later said, a SAB panel usually included a mix of people with diametrically opposed views-and their report reflected the consensus opinion. As for his supporting the Hog, the report emphasized that the plane needed modifications to improve its performance. Indeed, during this time, the Air National Guard examined the engine modification because diminishing procurement funds meant that it might have to keep its A-10s for a while. The SAB study got more defense media attention than the others conducted on the CAS plane issue; but since its findings fit neither side's preconceived notions, it rated only periodic mention.<sup>5</sup>

<sup>&</sup>lt;sup>4</sup>SAB CAS Report, 1-13. The SAB committee warned that putting a new engine in the A-10 could introduce "surprise problems" (13), as it had with other aircraft. Potential problems could be higher fuel consumption, louder noise, and greater heat signature for heat-seeking SAMs.

<sup>&</sup>lt;sup>5</sup>Burton, <u>Pentagon Wars</u>, 40, 48, 56-57, 58-59 (Burton worked for Toomay, and respected his integrity); SAB CAS Report, 7; "USAF Panel Urges Separate CAS,

The Air Force and OSD did not stop with the IDA, SAB, and CASADA studies. The Air Force Headquarters staff, as well as two subordinate major commands, TAC and Systems Command, accomplished their own staff inquiries. Fredericksen ordered, and the service funded, a review by the Beltway defense analysis company, BDM (Braddock, Dunn, and McDonough) Corporation. Most were completed by late 1988, and most of those backed their particular sponsor's preferences. Fredericksen and the CASMARG rejected all of the Air Force's findings, and this included even the BDM study, whose findings resembled the SAB's in favoring modifications to the A-10. The TAC study looked for a plane which could fly CAS and BAI, and also accomplish "successful single pass attacks." Fredericksen thought the Pentagon study, performed by its Studies and Analysis Office, was a sales job. Its combat scenario disregarded small-arms fire, denied A-10s very low altitudes, and gave F-16s an unproven heat-seeker countermeasures

Interdiction Aircraft," <u>AW&ST</u> 126 (27 July 1987): 22-23; and the following interviews by author: Fredericksen, Myers, Stenner, Toomay, and Welch.

Myers said that Air Force leaders recalled the known copies of the report and destroyed them. Fredericksen also claimed that the service suppressed the report. Burton makes clear that Toomay did not like the Blitzfighter idea, while Spinney remarked in passing that he did. Considering that Burton worked directly for Toomay and respected him makes his version more credible. Toomay insisted that the committee's effort was unbiased—and this was an unsolicited comment, since his author interview occurred two months before Welch's. Further, Toomay still marvelled at the heat that it generated.

Besides Chairman Toomay, the SAB CAS committee's members were: Dr. Paul Chrzanowski (Lawrence Livermore National Laboratory), Dr. William Heiser (Vice President and Director, Propulsion Research Institute, Aerojet General Company), Eugene Kopf (President, Litton Optical Systems), Dr. F. Robert Naka (Vice President, Engineering and Planning, GTE Government Systems Corporation), Elbert Rutan (President, Scaled Composites, Inc.), Dr. A. Richard Seebass (Dean, College of Engineering and Applied Sciences, University of Colorado), and Richard Shevell (Department of Aeronautics & Astronautics, Stanford University). MGEN John Loh served as active duty Air Force liaison.

The committee's formal activities spanned the years 1985-1986, and involved visits to TRADOC Headquarters for joint force and doctrine briefings, to Eglin AFB for weapons briefings, and to George AFB, California, to watch air support missions at the nearby Fort Irwin NTC exercises. The last formally scheduled event was a wrap-up at Lawrence Livermore Laboratory. (According to the agenda, the committee discussed A-10 engine modifications then.)

capability. The Systems Command inquiry assumed rugged F-16s, and BDM's investigation inserted subjective value assessments instead of using available hard statistics.<sup>6</sup>

The studies continued. RAND later produced one and IDA delivered yet another, but the CASADA's formal report and resulting MRP submittal climaxed the study phase. Fredericksen delayed his final decision about the follow-on CAS plane until its completion, which occurred in autumn 1988. However, this study produced only more rancor, since it still specified conditions which supported the F-16, and also assumed perfect operation of ATHS technology (remember that CASADA finished just as the Air Force conducted its F-16 CAS technology demonstration test). OSD wondered how the F-16 would operate without the new technology, as well as whether one could truly count upon its presence and good operation in every situation. The Air Force had already caused bad feeling when it raised CASADA's security classification to a level where some CASMARG members could not attend deliberations. Indeed, the bad blood which helped drive CASMARG's birth also surfaced in one OSD official's assessment of the CASADA findings: "The Air Force wants us to get out of the ballgame."<sup>7</sup>

<sup>6</sup>Brendan Greeley, Jr., "TAC to Modify A-7s, F-16s for Close Air Support," <u>AW&ST</u> 129 (29 August 1988): 40-41(quote, 40); John Morrocco, "Pentagon to Review Air Force Study Supporting Modified F-16 for CAS Role," <u>AW&ST</u> 129 (31 October 1988): 30; LTCOL Jim "Whale" Phillips, USAF, letter response to author, 18 April 1997, in author's possession; "Washington Roundup," <u>AW&ST</u> 129 (1 August 1988): 13; and the following previously cited interviews by author: Fredericksen, Pentland, and Russ.

Former congressional staffer Ringo tallied up twenty-nine formal CAS studies from the late 1970s through 1990. He and the other interviewees thought that most of them backed their sponsors' opinions. Apparently, OSD used IDA two more times for research. Pentland mentioned that there were independent studies by Northrop and Lockheed, both of which endorsed using Stealth technology for CAS planes--not surprising, since Lockheed built the F-117 Stealth fighter and Northrop built the B-2 Stealth bomber. The SAB CAS study rejected this option, by the way, due to the limits of that technology and its inapplicability to CAS.

<sup>7</sup>Finley, <u>Replace the A-10</u>, GAO, 15-18 (recounts various Air Force and Army threat studies which condemned the A-10); John Morrocco, "Air Force, Pentagon Unable to Agree on New CAS Aircraft," <u>AW&ST</u> 129 (28 November 1988): 84, 86 (quote); Morrocco, "Pentagon to Review Air Force Study," 30; Robert Ropelewski, "Congress Stirs Pot, Air Force Simmers as Close Air Support Decision Nears," <u>AFJI</u> 128 (February 1990):

The CASADA presentation capped two years of bureaucratic wrangling. Ironically, the Air Force was slowly gaining the upper hand in this fight. The service's Pentagon staffers pointed out that Fredericksen's CASMARG violated recent legislation governing the relationship between OSD, the uniformed services, and the Secretary of Defense. Only the Chairman of the Joint Chiefs of Staff could advise the Secretary on defense policy, but the airmen claimed that the CASMARG usurped that function by advising the Secretary on CAS matters. One staff source asserted that this affected Fredericksen's CAS plane efforts, but the bureaucratic bottom line was that the service could always just press forward with its plans and try to withstand the resulting heat. Further, the conditions prevailing in 1987 also contributed to Fredericksen's weakening position. Force reductions made the service's desire to use an existing multirole aircraft more compelling. Also, the service's own adamant insistence upon the F-16 discouraged contractors from making bids, though they at least conducted design studies. Therefore, in late 1987, Fredericksen compromised his stand. He stopped restricting design proposals to those which emphasized simple and inexpensive planes, and instead expanded consideration to all designs.<sup>8</sup>

Fredericksen's move did not change the Air Force's mind. After all, 1988 was the year the debate waxed ever hotter and General Russ made his brazen and criticized pitches

<sup>8</sup>"USAF, Defense Dept. [*sic*] Reach Compromise on New CAS Aircraft," <u>AW&ST</u> 127 (7 December 1987): 33; and the following interviews by author: Farmer, Fredericksen, Pentland, and Spinney.

Fredericksen did not specify why he changed his stance, but did say that the proceedings were dragging on with no solution. Others felt that he gave in to the Air Force. The compromise and the Air Force's CASADA security classification tactic led Spinney to leave the CASMARG. Paul Farmer replaced him. The CASADA study remains classified, and the information derived for this work is from general references to its provisions by articles, congressional testimony, a GAO report, and interviewees.

<sup>22 (</sup>recounts later burst of on-going CAS studies); and the following interviews by author: Farmer, Fredericksen, and Spinney.

Both Farmer and Spinney charged the Air Force with using security classification to bar them from the CASADA study. The service claimed that it was examining usage of the then-highly classified Stealth technology for CAS. Spinney thought that his opposition to CASADA's force packaging requirement for CAS planes pushed the Air Force move.

for the F-16. Having given the service some leeway in the CAS plane search, Fredericksen's CASMARG still pushed the service to seek alternative CAS plane design studies from six companies. The service's attitude during this effort was so obvious that an <u>Aviation Week</u> editorial called it a "Close Air Charade." In fact, the aviation journal reported in June that TAC headquarters' Brigadier General Joseph Ralston told a Lockheed senior official that the company "should not waste money on a new CAS aircraft for the next twenty years" because the Air Force's CAS plane would be the F-16.<sup>9</sup>

## Congress, Its Interests, and the Fortunes of Constituent Planes

The service's behavior spurred congressional intervention, which introduced further complexity due to the legislators' varied motives. The 1986 Goldwater-Nichols Act required, among other military reform measures, a periodic congressional and DoD review of service roles and missions, and the CAS issue was a good starting point. (Air Force staffers also used provisions within this law to attack the CASMARG.) Also, Air Force Pentagon staffers working the CAS issue later said that Russ' Fighter Roadmap lost credibility with both Air Force Headquarters and Congress, since it asked for so much. The plan at least made tactical sense, in that Russ wanted a large force of multirole fighters to respond flexibly to any contingency. Smaller numbers of specialty planes, whether F-15s, F-111s, or A-10s, would enhance Air Force capability in situations demanding their strengths. He wanted to hide the A-10s in the FAC role so Congress would allow him to maintain a large air support force. However, given the budget reductions underway, Congress rejected the plan as unrealistic. Also, the public residue of Russ' and the other service leaders' efforts on behalf of the F-16 upset congressional military reform advocates, ex-Marine congressional staffers, and some A-10 pilots--the latter of whom discreetly

<sup>&</sup>lt;sup>9</sup>"Close Air Charade," <u>AW&ST</u> 128 (28 March 1988): 9; Congress, Senate, <u>DoD</u> <u>Authorization FY 89, Pt. 4</u>, 57; Finley, <u>Replace the A-10</u>, GAO, 21-22; "Washington Roundup," <u>AW&ST</u> 128 (13 June 1988): 15 (quotes); and Farmer, interview by author.

The six companies were Boeing Military Airplanes, General Dynamics Corporation, Lockheed Corporation, McDonnell-Douglas Corporation, Northrop Corporation, and Rockwell International Corporation.
registered their opinions with Congress. Each of these groups had its own reasons for considering CAS a legitimate mission: the congressional reformers received inputs from OSD allies like Christie, Spinney, and Sprey; the Marines emphasized CAS; and the A-10 pilots were an empathetic constituency. Some of the legislators and staffers had their own individual motives. Congressman Les Aspin (D-WI) always searched for military budget savings and saw opportunities in the debate. Senator Alan Dixon (D-IL) had the bedroom communities for the McDonnell-Douglas Corporation among his constituency, and thus he pushed that company's AV-8 Harrier as a follow-on CAS candidate.<sup>10</sup>

<sup>&</sup>lt;sup>10</sup>Anonymous interviewee "D," telephonic interview by author, 6 May 1997, notes in author's possession; Brown, <u>Thinking About National Security</u>, 225-227 (discusses complex congressional dynamic in any weapons decision); "Defense Dept. Asks USAF to Broaden Design Options," <u>AW&ST</u>, 28 (mentions that Congress' Military Reform Caucus was monitoring the dispute, and preferred a Mud Fighter type plane); John Highbush, telephonic interview by author, 14 February 1997, notes in author's possession; Andy Ireland, telephonic interview by author, 30 April 1997, notes in author's possession; Paul Mann, "Senate Girds for Fight with USAF Over Close Air Support Aircraft," <u>AW&ST</u> 129 (22 August 1988): 21-22 (notes Dixon's enthusiastic support for the AV-8); Rick Maze, "Aspin: Budget Tactics Rooted in Need to Teach DoD a Lesson," <u>Air Force Times</u>, 23 April 1990, 10; COL John Rosa, USAF, telephonic interview by author, 31 March 1997, notes in author's possession; Winslow Wheeler, telephonic interview by author, 6 May 1997, recording and notes in author's possession; and the following previously cited interviews by author: Battista, Christie, Farmer, Fredericksen, Pentland, Phillips, Ringo, Russ, Welch, and Yates.

<sup>&</sup>quot;D," Highbush, Ringo, and Wheeler were all congressional staffers dealing with the CAS plane issue at this time, and noted the Reformers and Marine staffers' influence. Ringo mentioned the A-10 pilots' discreet complaints. Yates, who was Deputy Assistant Air Force Secretary for Acquisition in 1989, also noted partisanship within the service for the A-10 and F-16. Fredericksen, Pentland, and Welch thought that Dixon's Harrier motivation seemed to be the McDonnell-Douglas bedroom community constituency in southwest Illinois. Battista was a congressional staffer who said that the Congress normally favored the Marines; and that this may also have been Dixon's interest. Pentland, Phillips, and Rosa were all Air Force Pentagon staffers who worked the CAS plane issue during this time. Pentland and Rosa were the staffers who discussed Russ' Fighter Roadmap difficulties. All of them thought that some of the congressional staffers used the debate to promote themselves, and Pentland specifically accused the OSD Reformers of feeding information to sympathetic congressionals. Ireland was a Florida Republican congressman during this time who disliked what he saw as military waste; he also cited the influence of ex-Marine congressional staffers.

Congressional advocacy manifested itself in a number of ways, and one of the more revealing came via the Government Accounting Office (GAO) reports addressing the debate. As the dispute erupted in early 1987, and OSD and the Air Force embarked upon their myriad studies, the House Committee on Armed Services commenced its own investigation of the matter using the GAO. This particular report's findings indicated the issue's complexity. Published over a year later, it only recounted the history of the debate and ventured no recommendations. As congressional hearings started focusing more upon the issue in 1988, the legislators asked the usual question: since the Marines enjoyed such a great CAS reputation, why did the Air Force not buy the Marines' AV-8 Harrier attack jet? The legislators tasked GAO to study this question, and the GAO answered that the services had their own specific needs and again made no recommendation. The GAO was a bit more decisive concerning General Russ' FAC A-10 plan. With the service busily demonstrating the value of ATHS, Congressman Aspin (then Chairman of the Armed Services Committee) had the GAO investigate whether the services needed airborne FACs. GAO cited the Air Force's own assertions about the lethal modern battlefield and ATHS's worth to say that airborne FACs were probably unnecessary. Thus, it recommended that the Air Force delay spending any money on modifying A-10s for the FAC role until further testing confirmed the service's ATHS claims!<sup>11</sup>

<sup>&</sup>lt;sup>11</sup>Brown, <u>Thinking About National Security</u>, 233-234 (notes criticism of the GAO study as a forum for its congressional sponsors' opinions); Finley, <u>Replace the A-10</u>, 2-4 (the report did not even present any findings); Harry Finley, Director, Air Force Issues, GAO, <u>Close Air Support: Comparison of Air Force and Marine Corps Requirements and Aircraft</u>, GAO/NSIAD-89-218, (Washington, D.C.: GPO, 1989), 2-5; John Ginovsky, "GAO Report Urges Air Force to Delay A-10 Modification, Test Information System," <u>Defense News</u>, 4 June 1990, 54; and Nancy Kingsbury, Director, Air Force Issues, GAO, <u>Close Air Support: Airborne Controllers in High Threat Areas May Not Be Needed</u>, GAO/NSIAD-90-116, (Washington, D.C.: GPO, 1990), 2-13; and the following interviews by author; Pentland, Phillips, Rosa, and Russ.

For examples of congressional interest in the Marines and their AV-8 during this time, see Congress, House, <u>H.R. 4264</u>, 257-263, 298; and Congress, Senate, <u>DoD</u> <u>Authorization for FY 89, Pt. 4</u>, 17-27, 48-54, 59-64. In these, the legislators asked Marine generals about CAS, to see if there was any applicability to the Air Force situation. They also insistently asked the other witnesses, which included Air Force and Army generals, as well as Don Fredericksen, if they seriously considered the AV-8.

One other GAO report addressing the CAS aircraft issue at this time also revealed, in part, the distinctly different constituent sponsorship situations of two CAS plane competitors from the 1970s, the A-7 and the A-10. The A-7 had strong backing, since the Texas congressional delegation's influence on behalf of its defense contractors was well known from earlier decades. And it could still generate pressure; an early-1980s Washington Post article complained about how Congress pushed more A-7s upon an unwilling Air Force, thus recalling General Russ' lament about congressional pressure and accepting unwanted planes. However, in this case, A-7 manufacturer LTV submitted a modification proposal attractive to the Air Force-at least in the mid 1980s when the service first announced its CAS plane intentions. LTV offered an A-7 variant featuring an afterburning engine, low supersonic speed, and the most advanced avionics-including night vision equipment-to answer the service's desire for an off-the-shelf design able to perform high speed BAI. General Russ wanted LTV to move quickly because he and other Air Force leaders saw the new A-7 as an interim replacement plane for the A-10. From the mid 1980s onward, the defense press produced many articles hailing its anticipated comeback; thus providing further kindling for an already involved debate. The modified A-7 clamor was strong enough that, in April 1987, Congress directed GAO to study the plane's potential. GAO's September 1988 response was once again cautious. The agency did not like the uncertain costs and results involved in upgrading the Vietnam-era attack plane. Further, it noted that other studies found the current A-7 models lacked survivability features, and wondered if the modifications accounted for this. Still, the GAO investigators wanted the modified version tested, and Fredericksen and the CASMARG had already allowed the design proposal to continue development. In 1987, the Air Force awarded LTV a contract to build two prototypes for further testing. TAC's CAS plane study insisted that modified A-7s, called A-7Fs, and F-16s should be the

General Russ inadvertently described another pitfall of hiding the A-10 in the FAC role. He had to stop overzealous TAC Headquarters staffers from removing the GAU-8A guns from FAC unit A-10s—the officers wanted to save money and believed a FAC A-10 did not need a gun.

service's future air support force. By 1989, the prototypes started flying, amidst some acclaim from Air Force backers such as Richard Hallion and the <u>Air Force Times</u>.<sup>12</sup>

Other than the A-10 pilots complaining to congressional staffers, there were neither GAO reports nor congressional sponsors dedicated to keeping the A-10. Fairchild's mid-1980s president, Robert Sanator, later said that a closed production line--and the A-10's line shut down in 1984--was nearly impossible to reopen. The CASMARG asked the company to propose either a new design or a modified A-10, but the company's opportunity to participate in the CAS plane design study ended with two developments. One was the Air Force's desire for the F-16, and the other was the company's ignominious departure from military aircraft production in 1987. The Air Force selected Fairchild to build a new trainer jet, the T-46, but the company utterly failed to deliver the plane on time and within budget. The service refused to fund the T-46 in 1985, and after some controversy, terminated the program in 1987. With this, Fairchild-Republic shut down its

<sup>&</sup>lt;sup>12</sup>David Bond, "Defense Dept. Plans CAS Review; Congress Seeks Upgrades Agreement," AW&ST 131 (11 September 1989): 31-33; Bloom, "Attack Aircraft," 16; Carlson, 58-59; Frank Conahan, Assistant Comptroller General, GAO, Close Air Support: Upgraded A-7 Aircraft's Mission Effectiveness and Total Cost Unknown, GAO/NSIAD-88-210 (Washington, D.C.: GPO, 1988), 2-4, 15-18; Fulghum, "A-7F Makes Comeback as Temporary Solution," Air Force Times, 4; Greeley, "TAC to Modify A-7s, F-16s for Close Air Support," 40-41; Hallion, Strike from the Sky, 267; Mann, "Senate Girds for Fight with USAF," 21-22; Nordeen, "The Close Air Support Debate," 42; Schaeffer, "Rebirth of the Corsair II," 32-39; Will Schaeffer, "The LTV YA-7F [the formal designation for the prototype]: Updated CAS/BAI Aircraft Nearing Reality," Asian Defense Journal (May 1988): 82-86; Carole Shifrin, "LTV Receives Air Force Contract to Modernize, Reengine A-7Ds," AW&ST 126 (1 June 1987): 85-88; Ropelewski, "Affordability to Take Priority in USAF Advanced Fighter Design," 15-16 (depicts the A-7 as the answer to the Air Force's desire for an affordable CAS plane); Wilson, "Vought Corporation's A7 Impossible to Shoot Down," The Washington Post, A3; and the following interviews by author: Fredericksen, Russ, Toomay, and Welch.

The articles by Bloom, Bond, Greeley, Mann, and Ropelewski either purport to discuss the debate or start with other news of the debate, and then move to a discussion of the A-7F and its progress. Nearly all articles feature pictures of the plane. Carlson proposes a mix of A-7s and F-16s in his piece.

Fredericksen, Russ, and Welch did not mention any undue political pressure on behalf of the A-7F, but Toomay thought that the A-7 proposal carried weight because of it.

Long Island production facility and ceased military aircraft production operations. Grumman Corporation, a Long Island producer of Navy combat planes such as the F-14, assumed responsibility for the A-10, but an Air Force plane no longer in production was a low priority with Grumman, to say the least.<sup>13</sup>

During the SAB study, Toomay visited Fairchild's Long Island plant and saw antiquated production facilities; apparently these had changed little since the mid 1970s Hails Report. Downey (congressman from Long Island), McMullen, and Russ recalled that the T-46's 1985 "roll-out" ceremony was a disaster. Russ said that a plane normally flew a demonstration flight during its roll-out ceremony, but the T-46 was so underdeveloped that it could not. McMullen described the roll-out T-46 as a hollow plane, and cited poor top-level management as a key factor in the company's problems (though he praised Sanator). Sanator admitted that Fairchild underbid the trainer plane contract too much, and lacked the resources to make its plan work.

An interesting sidelight is that former TAC commander Dixon was Fairchild's president from his 1978 Air Force retirement to 1982. He apparently did not get along

<sup>&</sup>lt;sup>13</sup>"A New Pilot Tries to Pull Fairchild Out of a Nosedive," Business Week (16 September 1985): 100-102: Don Fredericksen testimony in Congress, House, H.R. 4264, 10 March 1988, 254-255 (Fredericksen tells the panel that Fairchild's difficulties rendered the company unable to participate); "Fairchild Rolls Out First T-46A Trainer," AW&ST 123 (18 February 1985): 25; "Fairchild Tightens Procedures Following Air Force Review," AW&ST 123 (9 September 1985): 18-20; Grumman: Moving Beyond the Wild Blue Yonder," Business Week (1 February 1988): 54-55 (this piece on Grumman's overall fortunes makes no mention of its assuming A-10 responsibility); "Grumman Team Evaluates Buy of Fairchild Republic Co.," AW&ST 123 (25 November 1985): 17; "Let the Buyer Beware!" IDR 18 (December 1985): 1945; "New York Legislators Ask for Fairchild Reprieve," AW&ST 123 (9 September 1985): 18; David North, "Congressional Impasse on T-46A Prompts NGT [Next Generation Trainer] Recompetition," AW&ST 125 (27 October 1985): 16-17; "Pork-Barreling the T-46A," AW&ST 125 (27 October 1986): 9 (decries the New York delegation's attempts to force the Air Force into a flyoff between the T-46 and T-37); Carole Shifrin, "Sale Will Enable Fairchild Aircraft to End Uncertainty, Pursue Growth," AW&ST 127 (14 December 1987): 105-111 (no mention of A-10's fate); "T-46A--Dead or Alive?" AW&ST 125 (18 August 1985): 13 ("Fairchild Republic fumbled badly on the T-46A developmental program and compounded its mistakes by trying to conceal the problems from its corporate management as well as its customer."); "T-46 Termination Will Force Closure of Fairchild Facility on Long Island," AW&ST 126 (23 March 1987): 27; "USAF Examines T-46 Alternatives in Face of More Budget Restraints," AW&ST 123 (21 October 1985): 23; "USAF Urges Cancelling Fairchild T-46, Extending Cessna T-37 Service Life," AW&ST 124 (17 March 1986): 31-32; "Washington Roundup," AW&ST 127 (17 August 1987): 17; and the following interviews by author: Dixon, Downey, Hennigar, McMullen, Russ, Sanator, Stenner, and Toomay.

In the meantime, the Hog was virtually on its own. Even an extensive avionics modification, called the Low Altitude Awareness and Targeting Enhancement (LASTE) program, occurred due to an unusual combination of circumstances. The Air National Guard, especially its Syracuse A-10 outfit, sponsored a GE fire control modification for the A-10. Incorporating a ground collision avoidance warning system into the modification helped its acceptance by the Air Force for flight safety reasons; otherwise, LASTE probably would not have survived initial review. Thus the late 1980s found it undergoing test and development. The Air National Guard's other initiative for the plane, incorporating more powerful engines, vielded a study with disturbing conclusions (TAC also did a study). Installing GE F404 engines--the same ones that powered the Navy's F/A-18 strike fighter and the Air Force's F-117 Stealth fighter--introduced the kinds of problems that Toomay's SAB report warned about. Fuel consumption at the high power settings needed to push the Hog through the air faster was high enough to threaten loiter capability. The proposed solution was to avoid using the high power settings except in serious combat situations, but as one AATC staff officer observed, the temptation to pilots to overuse it would probably be too strong.<sup>14</sup>

with the civilian management. Sanator was diplomatic in assessing Dixon' tenure; he described Dixon as very intelligent and energetic, but lacking in business knowledge. McMullen believed that Dixon's tough leadership style did not mesh well with corporate ways. In his Air Force Oral History, Dixon did not specifically enumerate his problems at Fairchild, but the irascible general gave a pungently negative assessment of corporate culture. See Cleary, Dixon, 328-329.

Hennigar (A-10 test project office chief at Nellis AFB in the late 1980s) and Stenner mentioned that A-10 affairs were not a big issue with Grumman.

<sup>&</sup>lt;sup>14</sup>CAPT John Charlton, USAF, "Heating the Hog," <u>FWR</u> (Summer 1984): 16-18 (describes another Syracuse-initiated A-10 weapons modification: adding Sidewinder heat-seeking air-to-air missiles); CAPT Jeff Eggers, USAF, "Freefall Weapons Delivery with LASTE," <u>FWR</u> (Winter 1991): 8-11; Greeley, "TAC to Modify A-7s, F16s," 41; CAPT Cliff Latta, USAF, "A-10 Low Altitude Safety and Targeting Enhancement (LASTE) / Air-to-Air Gunsight," <u>FWR</u> (Spring 1991): 29-35; CAPT Norman Rennspies, USAF, "LASTE and the GAU-8 at 15,000 Feet," <u>FWR</u> (Winter 1990): 2-7; Schaefer, "Rebirth of the Corsair II," 39; Ulsamer, "New Roadmap," 111; and the following previously cited interviews by author: Adams, Chaleff, Hennigar, Henry, Kuebler, Pentland, and Stenner.

## Congress Holds Hearings and Takes Action

The year 1988 witnessed much more congressional probing of the debate via budget hearings. In March, a subcommittee of the House Armed Services Committee called in OSD, Air Force, Army, and Marine Corps representatives to explain the varying points of view. There was a brief flash of congressional advocacy for the A-10 when the subcommittee chairman, New York's Sam Stratton, asked Don Fredericksen if the CASMARG gave Fairchild-Republic a chance to propose a modified A-10. Fredericksen quickly answered that Fairchild's difficulties rendered it unable to respond, and there the matter rested. (Fredericksen mentioned that the Air National Guard was the only agency still interested in A-10 modifications.) The Marine generals explained their CAS procedures and praised their Harrier so well that the lawmakers pressed OSD and Air Force representatives to study the Harrier more closely. Fredericksen answered that he did

All of the interviewees pointed out that the TAC leadership accepted LASTE on its safety contributions. None thought that it would have succeeded otherwise--though Pentland defended the service by saying that budget concerns delayed necessary modifications for other fighters as well.

Besides Charlton's work, the other <u>FWR</u> articles explain some of LASTE's fire control features.

Pentland was the only one who downplayed the Syracuse squadron's importance to LASTE's fortunes. He said that GE already tried to sell the new fire control system before Syracuse pushed it. The others rightly emphasized that though other people and organizations played significant roles, the Syracuse A-10 squadron initiated and carried the modification proposal. Dan Kuebler, a Syracuse A-10 pilot who also worked for GE, and who later worked as a defense consultant in Washington, played the most prominent role. One could question--and some of this footnote's other interviewees did--Kuebler's interest conflicts in this case. Even when reviewing Kuebler's own account, one wonders which "hat" Kuebler wore at certain times. However, Kuebler made sure this important modification got a hearing.

Adams, and the Ulsamer, Greeley, and Schaefer articles point out the design features which restrict the A-10's speed (Ulsamer quoted Adams). Adams said that the plane's fat wing was the biggest factor, while Schaefer also blamed the engine mounting. Greeley cited GEN Russ and a TAC study which found that a more powerful engine would increase speed at the cost of loiter time and range. Stenner and Kuebler, who were familiar with Air National Guard studies of the issue, made similar observations. Stenner, who was the "AATC officer," mentioned the performance obstacles while Kuebler emphasized cost problems.

not like the Harrier's vulnerability to hits; others explained that the service had twice before rejected the plane due to its lack of desired payload and range capability. The Air Force and Army representatives reiterated their agreement, based upon AirLand Battle doctrine's dictates, that the lethal, chaotic, and high-tech "battlefield of the 1990s" required an interdiction plane like the F-16. Indeed, even Fredericksen pointed out that the Army's confidence in defeating forces on the battlefield made it more interested in interdiction. The same witnesses appeared before the Senate Armed Services Committee that same month, with much the same result. The senators, Dixon prominent among them, pressed the Harrier's case with the help of Marine witnesses. In response, the Air Force and Army stood their ground concerning the F-16. With this impasse, and other factors such as the service's brazen attempts to sell the CAS F-16, an <u>Aviation Week</u> article pointed out that opinion "had hardened on Capitol Hill that the Air Force has willfully obstructed an on-the-merits evaluation" of follow-on CAS planes.<sup>15</sup>

<sup>&</sup>lt;sup>15</sup>The witnesses who appeared at both hearings were Don Fredericksen (CASMARG Chairman), BGEN John Hopkins, USMC (Director of Plans, Headquarters Marine Corps), MGEN Alfred Logan, USAF (Director of Plans, Headquarters Air Force), MGEN Wilson Shoffner, USA (Assistant Deputy Chief of Staff for Operations and Plans [Force Development and Integration]), MGEN Michael Sullivan, USMC (Commander, Second Marine Air Wing). Loren Larson, Director of Conventional Initiatives, Office of the Deputy Under Secretary for Tactical Warfare Programs (run by Fredericksen) appeared in the House Hearings.

The sources are Congress, House, <u>H.R. 4264</u>, 254-255 (Fairchild situation), 257-261 (Marines' presentation), 262-263, 298 (Harrier questions and responses by Fredericksen and Larson), 271-276 (Shoffner's presentation; desire for follow-on forces attack), 268-269 (Logan defends F-16), 277-288 (Logan's presentation; "battlefield of the 1990s" on 279; "high tempo, non-linear battlefield" on 281); Congress, Senate, <u>DoD</u> <u>Authorization FY 89, Pt. 4</u>, 8-16 (Logan's presentation; "battlefield of the 1990s," 9), 30-31 (Logan defends F-16), 48-49-55, 59-64 (Senators Carl Levin [D-MI] and Dixon press Fredericksen, Logan, and Shoffner on AV-8; Sullivan supports AV-8); and Mann, "Senate Girds for Fight," 21 (quote).

Interestingly, Logan's presentation did not mention the F-16 specifically. Instead, he laid down a warfighting scenario which supported its procurement. When the panel members pressed him, he came out for the F-16. Concerning the A-10, he agreed that it had been a good plane--but then he added that "as we move into the battlefield of the 1990s, we are now talking about a little different environment and that is why we need a follow-on plane that can do the job in the 1990s as well as the A-10 has done since the

This "opinion," by mid 1988, manifested itself in action. In the report for the National Defense Authorization Act for Fiscal Year 1989, the House Committee on Armed Services indicated that it wanted OSD and the Air Force to consider the AV-8 and other existing aircraft in its follow-on CAS plane study. The National Defense Authorization Act for Fiscal Years 1988 and 1989 demanded that the Secretary of Defense provide a master plan for CAS/BAI operations and requirements by the end of 1989. Further congressional action that fall augmented this directive. The Defense Authorization Amendments and Base Closure and Realignment Act (P.L. 100-526) ordered the Secretary of Defense to determine the feasibility of transferring the A-10 and the CAS mission to the Army. It also called for OSD's Director of Defense Operational Test and Evaluation (OT&E) to plan a competitive flyoff between CAS plane candidates.<sup>16</sup>

One publication stated that Congress aimed to finally resolve the CAS problems which periodically surfaced during the last forty-odd years. However, sources both inside and outside of Congress later said that the legislators wanted to scare the Air Force away from choosing the F-16. Though most lawmakers seemed to be against this plane, opinions differed in Congress about the best alternative. OSD at least seemed impressed by their actions. In response to late-1980s concerns about the national budget deficit, as well as a reduction in U.S.-Soviet tensions, all agencies--the Reagan administration, Congress, and DoD--worked to reduce the military budget far more significantly than

<sup>1970</sup>s" (Senate, 38).

This work has discussed the difficulties involved with performing CAS in poor weather; but Logan granted the F-16 an ability to perform CAS/BAI in *really* bad weather--three hundred foot cloud ceiling and 1 1/2 miles visibility (36). He based this upon F-16s modified primarily to perform night *clear weather* missions.

In his author interview, Pentland opined that one reason the Marines praised their Harrier was to help secure Harrier purchases by the Air Force. A larger buy would reduce the plane's per-unit cost for everyone.

<sup>&</sup>lt;sup>16</sup>Finley, <u>Comparison of Air Force and Marine Corps Requirements</u>, GAO, 11-12; (gives lawmaking background); Garrett, "Close Air Support: Which Way Do We Go?" 1; Mann, "Senate Girds for Fight with USAF Over Close Air Support Aircraft," <u>AW&ST</u>, 21-22 (notes increasing congressional dissatisfaction, especially Senator Dixon's desire that the Air Force consider the Harrier); and White, "Divestiture," 1, 4.

anticipated. The practical results for the military were dramatic reductions in weapons purchases and force structure. In 1988, Don Fredericksen realized how this might terminate any congressional interest in procuring a CAS plane, and he and the CASMARG thus presented another CAS plane compromise: rejecting the modified A-7 proposal and accepting a mix of A-10s and CAS F-16s-both modified with FLIR and ATHS technology. (The F-16s in this proposal would include older models modified with survivability features and brand-new models built to CAS specifications.) The OSD Director of Defense Operational Test and Evaluation (OT&E), John Krings, also tried to make the flyoff test a relatively quick and inexpensive undertaking-at least for its ambitious aims. His first proposal was for a two-phase test which included only the A-10, A-7 (as a "surrogate" for the modified A-10), and F-16. The first phase would last several months and address three different European battle scenarios. Krings hoped that it would answer many of the questions concerning each competitor's suitability and thus eliminate much of the rest of the test. If not, then the lengthier second phase would address more diverse scenarios in order to produce a winner. Krings planned to stage the test at Army maneuver ranges, using large ground units to simulate modern combat as much as possible. Further, he wanted the most sophisticated tracking and recording devices in order to properly record the proceedings.<sup>17</sup>

<sup>&</sup>lt;sup>17</sup>Caleb Baker, "CAS Test Plan Dispute Settled on Surface," <u>Defense News</u>, 12 June 1989, 10 (gave Congress' ostensible aims); Robert Dudney, "The Services Take Their Cuts," AFM 71 (April 1988): 16-20; "Gone Are the Halcyon Days," Military Technology (March 1988): 43-45; John Krings Statement, in Congress, House, Hearing before the Procurement and Military Nuclear Systems Subcommittee and the Investigations Subcommittee of the Committee on Armed Services, Close Air Support, 101st Cong., 1st sess., 19 April 1989, 33-40 (to be henceforth cited as "Congress, House, Close Air Support, 19 April 1989," to differentiate it from another 101st Congress House CAS hearing); John Morrocco, "Pentagon Proposes Testing Plan to Resolve CAS Aircraft Design," AW&ST 127 (20 February 1989): 97-98; OSD, Office of the Director, Operational Test and Evaluation (OT&E), "Operational Test Plan Concept for Evaluation of Close Air Support Alternative Aircraft" (31 March 1989), 1-6, I-1 - I-6, II-1 - II-48, and III-3 - III-26, Air University Library, copy in author's possession; "USAF to Accept Plan on Modifying F-16, A-10 for Close Air Support," AW&ST 130 (13 March 1989): 28 (optimistic assessment of Fredericksen's proposal); and the following interviews by author: Christie, "D," Farmer, Ringo, and Rosa.

### The Air Force Resists with Army Help

If the OSD, Krings, or Congress thought that they changed the Air Force leadership's mind through--respectively--compromise, a mandatory test, or intimidation, they were wrong. As the public debate revealed, the service did not stop plugging its choice throughout 1989. <u>Aviation Week</u> reported in late February that "senior officers are not happy with the prospect of retiring A-7 aircraft and retaining A-10s." Service leaders carped at Krings' test plan, saying that it did not account enough for the "ability of high-speed aircraft to hit targets in a fast-pass attack and the Army's ability to provide . . . accurate target information." They also protested Krings' omission of BAI missions and choice of the Army to conduct the test using its own facilities.<sup>18</sup>

<sup>18</sup>Baker, "CAS Test Plan Dispute Settled on Surface," 10 ("senior officers are not happy" quote); Krings Statement in Congress, House, <u>Close Air Support</u>, 19 April 1989, 37-40 (notes objections to test plan); Morrocco, "Pentagon Proposes Testing Plan," 97 ("high-speed aircraft" quote); and the following interviews by author: Christie and Farmer.

The Krings citation features the objections to his plan, but the ones mentioned in the text had a distinctly Air Force flavor. Indeed, during his testimony in Congress, Senate, Hearings before the Committee on Armed Services, <u>DoD Authorization for Appropriations for FYs 1990 and 1991</u>, 232, he directly stated that the service did not want the Army to conduct the test. Krings replied that as the CAS customer, the Army deserved to conduct it, and also that his plan was for a *CAS* test, not a BAI test. Christie claimed that the Air Force made the objections. Farmer believed that the Air Force talked Galvin into making his announcement.

<sup>&</sup>quot;D" said that the test was supposed to prove the best CAS plane. He cited some Marine influence in this regard, but said that it was not an outright push. Christie claimed that the Air Force's new CASMARG representative, LTGEN Yates, proposed the compromise to the CASMARG. Though it demonstrates Yates' professed desire to fairly pursue the best solution, his service would soon try to undo it. Farmer said that staffer John Hamre and Senator Carl Levin (D-MI) did not like the Air Force's attitude, and wanted to scare it into line. Ringo made a similar observation, citing Senator Sam Nunn (D-GA) and Senator John Warner's (R-VA) exasperation with the Air Force--but he added that they were not serious about transferring CAS to the Army. They used the test to goad the Air Force and OSD to resolve the issue in favor of a dedicated CAS plane design. Ringo also observed that Senator Levin did not like the service re-defining the CAS mission. Rosa succeeded Pentland as Air Force Plans Directorate CAS/BAI staffer, and thought that the congressionally directed test marked when the Air Force started to lose control of the CAS plane dispute.

Air Force opponents in Congress did not help their case in the early 1989 hearings, either--unless they intended to give the service enough rope to hang itself. Various staffers and legislators saw an opportunity to highlight the issue and apparently embarrass the Air Force. What they got instead was a fairly unified group of witnesses pushing the service's point-of-view. The House Armed Services Committee's April hearing on CAS called only three witnesses: Air Force historian and retired general Perry Smith, former Air Force Secretary Hans Mark, and OSD's OT&E Director, John Krings.<sup>19</sup>

Smith claimed that he would be objective and use the "lessons of history," but his formal statement resembled the pro-F-16 case made in the public debate. He enumerated military history "fundamentals" that apparently comprised the philosophical justification for his stance. Among these: an air campaign must be offensive and support the overall campaign by striking enemy centers of gravity--not just individual battles which might distract a commander emotionally. As for his historical examples, he cited only air support efforts in which air superiority was contested or where interdiction played a more prominent role than CAS. He also cautioned the House panel not to rely too heavily upon the Korean and Vietnam conflicts for historical lessons. Wrapping up his presentation, he recommended that for better education on CAS, the congressmen read, among other similar-minded authors, John Warden and Richard Hallion. For someone who studied the

<sup>&</sup>lt;sup>19</sup>Casey Anderson, "Close Air Support: A-10 or F-16?" <u>Air Force Times</u>, 15 October 1990, 28; Congress, House, <u>Close Air Support</u>, 19 April 1989, iii, 1-5; and the following interviews by author: Christie, Farmer, and Ringo.

Christie claimed that former Marine congressional staffer Charles Murphy pushed for the hearings. Farmer said that staffer Hamre and Senator Levin also played a hand. Ringo cited the general influence of former Marine staffers.

This author could not determine why Chairman Aspin and his committee called only these three particular witnesses. Aspin was no friend of many Air Force programs—perhaps he favored this one because he saw potential budget savings in using F-16s. Congressman Nicholas Mavroules (D-MA), who made one of the opening statements, later stated that he wanted further testing before accepting the CAS F-16 (Anderson, "A-10 or F-16?"). The three initial statements by Aspin, Mavroules, and Larry Hopkins (R-KY) indicated that they wanted to think about this issue before acting on it. Perhaps they had heard the anti-F-16 critique from OSD leaks, colleagues, or staffers, and wanted to hear the other side.

past, Smith seemed locked into the typical Air Force infatuation with high-tech future war. He supported the F-16 but asserted that unmanned vehicles would do CAS in future decades. (This may yet be so, but if human pilots struggle to discern friend from foe, one wonders how a machine will do it.) In later questioning, Smith cited his experience flying F-4s in Vietnam as a reason for using high speed planes for CAS, but this undercut his credibility. Smith said earlier that Vietnam was not a good historical example, but if he wanted to cite its lessons, one was the weakness of fast jet CAS.<sup>20</sup>

Opening his testimony, Hans Mark professed his lack of expertise, saying that "My experience is more in the laboratory than on the battlefield." He asserted that new technology, in the form of more effective SAMs and better sensors on air-to-ground weapons would change air support. In all, he believed that the "Air Force is on the right track by saying that you should have a ground-attack plane that has relatively high performance, high maneuverability and is relatively difficult to hit." To Mark, the Air Force's F-16 choice correctly followed its World War II practice of using fighter planes for CAS. This observation reflected Mark's willingness to venture from discussing technology to citing combat results, and in this, he made dubious claims. He stated that Soviet fast jet fighters did not suffer losses to Stinger missiles like slower aircraft, but then they did not fly much CAS either. He seriously erred when discussing the Falklands War's "lessons." To support his point about improved weapons, he cited the Argentines' cruise missile successes; but these weapons attacked ships in the open sea, not troops in contact. To

<sup>&</sup>lt;sup>20</sup>Congress, House, <u>Close Air Support</u>, 19 April 1989, 5-10 (Smith testimony; quotes, 6), 41-43 (future war claims, and F-4 experience).

Smith cited the Germans' 1939-1940 air support fortunes, the Americans' air support problems in 1943 North Africa, the Russians' Shturmovik use, and the Israelis' air support method as valid historical lessons (7). Per most Air Force leaders, Smith cited the Stuka's misfortunes as a reason not to use dedicated CAS planes (8), and also warned that declining budgets meant that the Air Force needed to abjure dedicated CAS planes just as the NATO allies had done (8-9).

Smith also recommended Cooling's <u>Case Studies in the History of Close Air</u> <u>Support</u> (cited in this work); Dan Mortensen's "A Pattern for Joint Operations: World War II Close Air Support, North Africa"; and Dick Simkin's "Race to the Swift." Smith said that Mortensen's work focused upon the air doctrine lessons in that campaign, and that Simkin's work focused upon possible future warfighting technology and methods.

Mark, the Argentine A-4s' performance signified the worth of high performance aircraft, but he forgot that the A-4 was a subsonic attack plane rejected by the U.S. Air Force. Mark claimed that the Argentines' twin-turboprop counterinsurgency plane, the Pucará, suffered heavy losses at the hands of British fighters and flak, but it did not.<sup>21</sup>

Krings briefed his test plan, and then he and the other two witnesses fielded the legislators' questions. Krings told the panel that with new weapons such as the Apache, the Army would probably need less CAS, and thought the test might reveal this. Mark repeated his assertion that more sophisticated weapons would also change CAS. When staffer Archie Barrett pressed the three to define the CAS which would be flown in the test, Krings supplied a numerical description—from the line of troop contact to approximately twelve kilometers behind that line. Smith introduced a definition oriented more toward interdiction and told the legislators that they should consult the Europeans for a good definition. The hearings ended with the questions, and the ensuing hearings transcript included a recent GAO report on CAS and a cartoon. Apparently reflecting some people's exasperation with the competing visions of the ideal CAS plane, the cartoon portrayed a compromise aircraft. It looked like a flying armored tugboat carrying every avionics feature and weapon in the American defense inventory.<sup>22</sup>

<sup>22</sup>Congress, House, <u>Close Air Support</u>, 19 April 1989, 29-40 (Krings' statement); 43-44 (Krings' Army views; he also said that service would not want to assume the mission if it could not get extra funding), 51-52 (Mark's assertions), 56-57 (CAS definition

<sup>&</sup>lt;sup>21</sup>Congress, House, <u>Close Air Support</u>, 19 April 1989, 10-15 ("experience," 10; "right track," 13).

For an assessment of the Argentines' use of cruise missiles and the Pucará's fortunes, see Rodney Durden and others, <u>Falklands, the Air War</u> (Poole, Dorset, U.K.: Arms and Armour Press, 1986), 26-27, 95-109; and Ethell and Price, <u>Air War, South Atlantic</u>, 27-29, 82-83, 148-149, 168-170, 188-189 Ethell and Price describe cruise missile use and also detail air losses suffered by both sides, and Durden and the others supply a by-airframe summary of the Argentines' Pucará force's wartime fortunes. The Argentines used Pucarás for ground support missions, though like much of their effort in this war, they did not use the planes as aggressively as they might have. Pucarás flew some air support missions and shot down one British helicopter. Of the twenty-six stationed on the islands, three were lost in air combat (one shot down by a Harrier, and the others by ground fire), while two others disappeared flying in the often atrocious Falklands weather.

The Senate hearing, which was part of an overall DoD budget hearing, brought in retired Army General Glenn Otis, who had recently stepped down as the Commander, U.S. Army in Europe. Otis supported the Air Force's position, since he wanted planes which could flexibly shift from one mission to another. John Krings again briefed his test plan. Don Fredericksen's replacement as CASMARG chairman and Director of OSD's Tactical Warfare Programs, Frank Kendall, discussed Fredericksen's recent compromise move. TAC's Director of Requirements, Brigadier General Joseph Ralston, accompanied him. Interestingly, given his assertion in 1988 that the Air Force's future CAS plane would be the F-16, Ralston conceded that his service would retain a mixed CAS plane force of A-10s and F-16s through the end of the century. In this regard, Ralston's testimony denoted a change in Air Force fortunes in this dispute.<sup>23</sup>

# The Air Force Skates on Thin Ice

April 1989 marked the apparent zenith in the Air Force's effort to procure CAS F-16s. It enjoyed virtually uncontested testimony in recent congressional hearings, and the Army supported its actions both in the Senate and elsewhere. General John Galvin publicly announced his support for the "A-16," and when the service publicized the results of its CAS F-16 technology demonstration test, Chief of Staff Vuono joined his Air Force counterpart Welch in declaring for CAS F-16s. The Air Force and Army leaders' joint statement also indicated tacit acceptance of the Fredericksen compromise, in that they anticipated keeping A-10s not only for the FAC role but also for CAS in low-intensity conflicts. (OSD tried to push the compromise further by including it in a budget proposal to Congress.) The compromise offered the service chiefs the chance to end the bureaucratic warfare and congressional meddling. The former CASMARG chairman had realized that the congressionally mandated test incurred a lengthy delay upon CAS plane

discussion), and 61 (cartoon). The GAO report is Finley's Replace the A-10.

<sup>&</sup>lt;sup>23</sup>Congress, Senate, Hearings before the Committee on Armed Services, <u>DoD</u> <u>Authorization for Appropriations for FYs 1990 and 1991</u>, 213-248. Otis testimony is on 213-221, and Kendall and Ralston's commentary is on 234-247.

selection, and hoped that a compromise would convince Congress of progress toward a solution. Perhaps the legislators would then relent, or at least approve the compromise in its budget while the test developed. If one waited for the test to provide answers, one delayed fielding needed modifications to the existing CAS planes; after all, one legislator reminded Krings during the House hearings that, as planned, the test would last longer than World War II. The compromise proposal also seemed a reasonable means, given the budget cuts underway, to retain a mixed force of planes which could complement each other in the air support spectrum. Finally, a compromise could preserve the F-16 production line which, with the budget cuts, faced termination if the CAS plane buy fell through. Still, in early 1989, the future augured well for the service's preferred CAS plane, as an <u>Armed Force Journal International</u> article headline proclaimed, "A-16 Stretches Lead in Race for Close Air Support Role."<sup>24</sup>

However, the service had already overplayed its hand. It did not moderate its stance in the on-going CAS debate, as 1989 featured pro-F-16 and anti-A-10 defense journal articles by Air Force Pentagon staff officers Carlson and Foglesong. Richard Hallion also published his pro-interdiction book, <u>Strike from the Sky</u>. This was the time when the A-10 community heard rumors of the Hog's imminent retirement. There were also OSD staffers who did not like Fredericksen's compromise and anonymously chafed about the Air Force's path in the defense press and to Congress. One asserted to <u>Aviation Week</u> reporters that the service's credibility suffered due to its F-16 obsession. Further, the Air Force's design stipulations and ensuing high cost estimates for accepting a reengined

<sup>&</sup>lt;sup>24</sup>Amouyal, "Gen. Galvin favors F-16 for CAS Role," <u>Defense News</u>, 21 ("A-16" quote); David Bond, "Budget Cuts, Cost Growth Cloud F-16 Plans for 1990s," <u>AW&ST</u> 131 (4 December 1989): 18-19 (reports that continued F-16 production for the 1990s depended upon the CAS plane sale); Congress, House, <u>Close Air Support</u>, 19 April 1989, 47 (Congressman John Kyl [R-AZ] teased Krings about the test's length); Fredericksen, interview by author; Robert Ropelewski, "A-16 Stretches Lead in Race for Close Air Support Role," <u>AFJI</u> 127 (April 1989): 17 (reports recent Vuono and Welch declaration for CAS F-16, as well as Fredericksen compromise offer and reasons); and Shifrin, "TAC Demonstration Bolsters Support for F-16 in CAS Role," 49 (Vuono and Welch declaration).

A-10 (separate from Fredericksen's compromise upgrades) or the AV-8 irked the lawmakers. Thus, House and Senate members may not have asked Air Force witnesses hard questions during the April hearings, but they disliked the service's attitude nonetheless. In September, the House denied funding for the A-10 and F-16 modifications requested to support OSD's compromise effort, and by this time, Congress added the AV-8 to the planes studied in the big test. "Nobody really believes the Air Force," said a congressional staffer, "The blinders they have on the F-16 are unbelievable."<sup>25</sup>

### The Political War

In November 1989, the CAS debate climaxed in a series of open clashes between the Air Force, Congress, and the Chairman of the Joint Chiefs of Staff. This was due to the confluence of different issues: the tri-annual military roles-and-missions review dictated by the 1986 Goldwater-Nichols Act, the shrinking defense budget's threat to favored programs, the continuing CAS plane debate in the defense press, and the disagreements over the nature of the CAS plane test.

<sup>&</sup>lt;sup>25</sup>Barbara Amouyal, "DAB [Defense Acquisition Board] to Settle Close Air Support Debate before Competitive Flyoff," <u>Defense News</u>, 9 October 1989, 26 (anonymous OSD staffer complaint); David Bond, "Defense Dept. Plans CAS Review," <u>AW&ST</u>, 32 (congressional ire over Air Force's A-10 and AV-8 estimates; House denies modifications budget; and staffer quote); David Bond and John Morrocco, "Close Air Support Move in Congress Might Disrupt Production of F-16," <u>AW&ST</u> 131 (13 November 1989): 24 (staffer observation about F-16 obsession); Garrett, "Close Air Support: Which Way Do We Go?" 29-30 (though Army COL Garrett concluded that the Air Force was correct to pursue the CAS F-16, he also insisted that the service do something to change its anti-CAS image); Smallwood, "Old Hog," 24 (Hog Drivers recalled reduced classes for A-10 checkout, and A-10 Fighter Weapons School instructors claimed that they were told to look for new assignments); and the following interviews by author: Christie, Farmer, Pentland, Rosa, and Spinney.

Christie, Farmer, and Spinney remained opposed to any accommodation toward a CAS F-16, though none admitted any specific contacts with the press and Congress in the author interviews. Pentland and Rosa saw these OSD staffers as the hard core of resistance, and Pentland especially felt that OSD opponents actively sabotaged the F-16 move via leaks to Congress and the defense press.

In order to better streamline American military operations and procurement, the 1986 Goldwater-Nichols Act required that the Chairman of the Joint Chiefs of Staff review and report on the services' roles and missions every three years. November witnessed completion of the first review and report. In it, the Chairman, Admiral William Crowe, tried to resolve the CAS plane debate by declaring that all services performed CAS in their own way. The Pentagon daily, Defense News, opined that Crowe's Navy background perhaps limited his awareness of the Air Force-Army CAS legacy. The announcement might also have been his parting shot at the pervasive issue, since his office published the overall roles and missions report one day before he retired. Either way, he misjudged its volatility, since his action suited neither Air Force Chief Welch nor Army Chief Vuono. Such an indefinite delineation of CAS responsibilities risked upsetting the delicate situation with Congress, and threatened yet another interservice roles-and-missions fight. Indeed, Congress wanted an answer from DoD by the end of 1989 about transferring the CAS mission to the Army--something both services vehemently opposed. Thus, Vuono and Welch openly rebutted Crowe in attachments that they managed to include as part of his report. Informing Crowe that their services had a long air support relationship and that they precisely defined CAS because of it, they reminded him that they saw CAS as a function performed by Air Force fixed-wing aircraft, and not by Army helicopters. The new Chief of Staff, General Colin Powell, backed the service chiefs. The Defense News also pointed out that Army General Powell was more aware of the Air Force-Army air support dialogue, and also did not want to ruin a recently improved relationship.<sup>26</sup>

Welch had little to say about this incident, but Vuono thought Crowe's assessment

<sup>&</sup>lt;sup>26</sup>Barbara Amouyal, "Powell Taps Air Force for Close Air Support," <u>Defense</u> <u>News</u>, 13 November 1989, 1, 43; David Bond, "Congress Eases F-16 Production Curbs; Pentagon Debates CAS Responsibilities," <u>AW&ST</u> 131 (20 November 1989): 32 (mentions DoD report and Chiefs of Staff disagreement); ADM William Crowe, USN, "Roles and Functions of The Armed Forces: A Report to the Secretary of Defense," (Washington: Chairman of the Joint Chiefs of Staff, n.d.), Appendix B to Enclosure B (Vuono/Welch joint memorandum opposing Crowe's CAS finding, and Powell's endorsement of Vuono/Welch), 10-11 (Crowe's findings); Littlejohn, "Close Air Support: Battle in the Fourth Dimension," 1-5; and the following interviews by author: Rosa, Vuono, and Welch.

Though the Air Force showed its mettle in dealing with OSD critics and Admiral Crowe, its resolution failed against Congress, which controlled the federal budget. November saw the Senate endorse the House's earlier denial of most of the money requested for the A-10 and F-16 modifications, but that was not all. By this time, the legislators had also directed that the test include yet one more plane, the Navy's F/A-18 Hornet strike fighter, and the Army's own weapons, such as its attack helicopters and guided missile artillery. They wanted everything involved with CAS analyzed to solve the CAS plane/weapon riddle--thus recalling Congress and OSD's desires for a similar test in the 1970s. (Meanwhile, the test's estimated costs ballooned from Krings' initial \$125 million estimate to over \$400 million. Its length stretched to six years, and its start date slid back to 1995.) When the lawmakers encountered what they called Air Force "lobbying" against the expanded test and the Army's control of its active conduct, they brought the service to heel by denying funding for any F-16s until it produced a test plan including the additions. An anonymous, retired-and apparently senior ranking-Air Force officer told Defense News that a "few creeps in Congress" and "Washington-based, think-tank officials" were to blame. An exasperated General Russ told reporters, "We need to .... write down what we think [italics in the original quotation] Congress wants us to do, and then take it to Congress and have them sign up to it." The congressional side saw the Air Force as the side playing games and made even blunter statements. "This is an Ayatollah Khomeini strategy, " said one staffer, pointing out that, like the notorious Iranian leader did with American diplomats, Congress took the Air Force's prize plane hostage. Another warned, "What Congress is saying to the Air Force is, 'Don't jerk us around any more.

was too simplistic, given the complex nature of air support. He also thought that it risked creating future interservice rancor, especially concerning weapons procurement. Army officer Littlejohn certainly thought congressional attention to the current CAS fracas helped drive the rebuttal. He also asserted that the fear of receiving the CAS mission and A-10s that went with it—but without accompanying funding—also spurred Army action. Finally, he claimed that reliable sources told him that TAC Headquarters played a big role in shaping the Air Force part of the response—apparently to guarantee that the service retained the mission. Rosa said that the rebuttals by Powell and the Chiefs were necessary to maintain interservice peace.

That's not the way to win the hearts and minds of the people on the Hill." Yet another specified that the funding ban would remain until the service "shapes up and takes close air support seriously." As an Air Force Pentagon staff officer later recalled, "Congress controls the force structure." It did so with a vengeance in this case.<sup>27</sup>

# CAS Dispute Denouement

The Air Force, backing away from the face-off, immediately informed Congress that it would cooperate. The lawmakers reciprocated by releasing contractually committed F-16 funding. However, they still wanted a test plan from the service which included their

Beyond Air Force complaints about the test, neither Fulghum nor the staffer he quoted was very specific about that service's "lobbying," but Fulghum did cite Air Force attempts to cut test funding in its own budget. Fulghum also quotes the staffer as saying that the Air Force was "making more and more noises about resistance" (25). This author believes that the general atmosphere of defiance, as demonstrated in the defense press debate and the rebuttal to Crowe, could also be called "lobbying."

Bond's "Close Air Support Move" article mentioned the specific terms of Congress' action, which appeared in the terms of an F-16 procurement authorization bill. The Secretary of Defense, Richard Cheney, had to certify that the new OSD OT&E Director, Robert Duncan, approved an expanded test plan. Further, the service had to conduct tests on the modifications, especially night-vision equipment, it wanted for the A-10 and F-16. Finally, the service had to equip any plane which participated in the Army's Fort Irwin National Training Center exercises with that facility's range instrumentation.

Farmer recalled that the Navy did not like inclusion of its F/A-18 strike fighter in the competition, lest the ensuing results force it to accept some other plane.

<sup>&</sup>lt;sup>27</sup>Amouyal, "DAB to Settle," 26 (latest test estimates and features); Caleb Baker, "CAS Test Plan Dispute Settled," 10; Bond and Morrocco, "Close Air Support Move in Congress Might Disrupt Production," 22 ("Khomeini" quote; the staffer said that Congress did not really want to disrupt F-16 production, but it did want to get the Air Force's attention), 23, 24 ("Don't jerk us around," quote); Congress, House, <u>Close Air Support</u>, 19 April 1989, 34-35 (Krings' estimate); Farmer, interview by author; David Fulghum, "Congress Holds AF's Favorite Fighter Hostage," <u>Air Force Times</u>, 27 November 1989, 25 ("shapes up" quote is apparently from a congressional staffer, given the article's structure; also "lobbying" quote, which is from anonymous congressional staffer), 26 ("creeps" quote by a "recently retired Air Force official" [25]); Pentland, interview by author (Air Force staffer quote); and Ropelewski, "Congress Stirs Pot, Air Force Simmers," 22-24 (Russ quote, 24).

additions. The service did this in spring 1990, via an around-the-clock planning session at TAC Headquarters.<sup>28</sup>

Interestingly, Air Force leaders later dismissed congressional actions such as the CAS mission transfer to the Army. Welch claimed that he gave it little thought. And though the CAS transfer issue lingered through 1991, the Air Force Chief of Staff of that time, General Merrill McPeak, later said in an interview: "I spent a grand total of zero time worrying about the problem."<sup>29</sup>

However, the Air Force did pay attention to Congress' actions, for no sooner had the service delivered the augmented test plan than it once again publicly complained about it. The air leaders were more likely concerned about the ever-shrinking budget and what any further congressional action would do to it. The European affairs backdrop to the late 1989 CAS confrontations helped this precipitous slide, for throughout the autumn, the people of the Warsaw Pact nations overthrew their communist masters. This undermined the vision of the big European War against the Soviets which justified not only the CAS F-16, but also AirLand Battle and much of the American military force structure.<sup>30</sup>

The shrinking budget affected the on-going OSD attempts to resolve the CAS plane question. When Congress ordered the Secretary of Defense to deliver a CAS/BAI plane master plan, the Secretary in turn ordered the Joint Chiefs of Staff to prepare a Mission Needs Statement (MNS) supporting it. The MNS which appeared in April 1989 matched Air Force studies, in that it dismissed the A-10 as unsuitable for BAI and opted for the

<sup>&</sup>lt;sup>28</sup>Bond, "Congress Eases F-16 Production Curbs," 32; and the following interviews by author: Christie and Hennigar.

<sup>&</sup>lt;sup>29</sup>GEN Anthony M. McPeak, USAF (ret.), telephonic interview by author, 8 March 1997, recording and notes in author's possession; Harrison, "A Gift the Army Can't Afford," 36-37; Benjamin Schemmer, "Congress Mandates Air Force Transfer Its A-10s to Army and Marines," <u>AFJI</u> 128 (December 1990): 20; and the following interviews by author: Farmer, Phillips, Ringo, Rosa, Russ, and Welch.

<sup>&</sup>lt;sup>30</sup>David Fulghum, "Air Force Calls CAS Test Plan Redundant, Expensive," <u>AW&ST</u> 132 (18 June 1990): 21-22 (note that this was the <u>AW&ST</u> issue with the generally positive articles about the Syracuse Guard's CAS F-16s).

F-16. Perhaps reflecting the recent CASMARG/Air Force compromise which aimed to guarantee upgraded CAS planes in the mid 1990s, it also stipulated a 1995 initial operational capability (IOC) which ruled out any plane not already in production. But the Joint Chiefs of Staff found themselves with the same solution then causing so much discontent on Capitol Hill, and called for a Defense Acquisition Board (DAB) to address the problem. A DAB was a committee similar to the old DSARC which normally held developmental milestone meetings for new weapons systems. In this case, the DoD leadership obviously thought the issue rated a formal acquisition review. (The DAB consisted of leaders from the Joint Chiefs of Staff office, OSD, and the services.) In the meantime, the Air Force continued a Cost and Operational Effectiveness Analysis (COEA) of the CAS plane issue which, through much of 1989 and 1990, pushed for the F-16.<sup>31</sup>

OSD announced that the DAB would render an acquisition decision even though planning for the congressionally mandated test continued, but the DAB's first milestone meeting leaned toward compromise. It resolved to make decisions for both short- and long-term CAS plane procurement, and aimed to do this by April 1990. It might have met this goal, but the Air Force delayed submitting inputs, apparently until it could see how the budget situation developed. One of its inputs was the COEA which, when the service did produce it, *still* supported the CAS F-16. This provoked an in-house face-off with OSD officials, who pointed out that the service used incorrect cost data in its study.

<sup>&</sup>lt;sup>31</sup>LTCOL Boyce Burley, USAF, ed., <u>The Joint Staff Officer's Guide</u>, Armed Forces Staff College Publication 1, (Washington, D.C.: GPO, 1993), 5-19 through 5-23; Amouyal, "DAB to Settle Close Air Support Debate," 26; and the following interviews by author: Farmer and Rosa.

A DAB included the following members: Under Secretary of Defense for Acquisition, Vice Chairman of the Joint Chiefs of Staff, Deputy Under Secretary of Defense for Acquisition, DDR&E, service acquisition chiefs, Assistant Secretary of Defense for PA&E, DoD Comptroller, and other involved acquisition staffers. Its stages, called Milestones, matched those of the earlier DSARC, and these included: Milestone 0, concept studies approval; Milestone I, concept demonstration approval; Milestone II, development approval; Milestone III, production approval; and Milestone IV, major modification approval.

Thus, the DAB pushed its decision milestone back to autumn 1990, which allowed the ever-shrinking military budget to dictate the choice even more. Congress and the rest of the nation started the year 1990 contemplating the recent fall of the Iron Curtain. At the time, Francis Fukuyama's essay, "The End of History?" sparked a debate about whether the world really was about to enter a new millennium of peace, liberal democracy, and consumerism. The implications for America's defense policy were obvious, as the force structure and weapons purchase reductions increased. In 1984, there had been plans for a 40 tactical fighter wing force in 1990, but that year found the service already holding at a peak of 36 and anticipating a reduction to as low as 25 by 1997. The fiscal reductions induced a game of musical chairs for planes and missions within the service, not to mention any proposed acquisitions.<sup>32</sup>

Things started looking up for the A-10 in this shuffle. In spite of the cuts, Congress voted funds for reengining the plane, thus sending a clear signal about what it would tolerate for CAS plane modifications. On the other hand, the A-7F faced an ominous future. Though Congress included it as one of the test candidates, the Air Force had by this time backed away from it. Two A-7F prototypes began developmental flight tests in late 1989, but Chief of Staff Welch believed the shrinking force projections left room only for existing planes--and most of those would be F-16s--instead of any other plane or variant. Also, the existing A-7 airframes were old, and suffered fatigue problems which would negate any performance advantages conferred by a more powerful engine.

<sup>&</sup>lt;sup>32</sup>Barbara Amouyal, "AF to Cease F-16 Buys as Wings Are Pared," <u>Defense News</u> 10 December 1990, 1, 51; Barbara Amouyal, "Tactical Wings Fight for Parity in Face of Historic Reductions," <u>Defense News</u>, 12 November 1990, 6, 22; John Elson, "Has History Come to an End?" <u>Time</u> 134 (4 September 1989): 57; Francis Fukuyama, "The End of History?" <u>National Interest</u> (Summer 1989): 3; Annetta Miller and others, "Peace Brings Tough Times," <u>Newsweek</u>, 6 August 1990, 44-45; Strobe Talbot, "The Beginning of Nonsense," <u>Time</u>, 11 September 1989, 39; and George Will, "History's Last Word?" <u>Newsweek</u>, 14 August 1989, 66.

Fukuyama's essay sparked much commentary, of which the above citations are examples. Strobe Talbott's sharp critique assumed that Fukuyama predicted an irreversible period of general peace and democratic prosperity. The "Peace Brings Tough Times" article is but one of several anticipating hard times for the defense budget and industry.

Interestingly, the Texas congressional delegation did not push the A-7 as hard as previously. The possible reasons were that the F-16's manufacturer, General Dynamics, was also based in Texas. And if ex-Senator John Tower and House Speaker Jim Wright's ill fortunes that year were any indication, the Texas congressional delegation did not have the clout that it normally had.<sup>33</sup>

In fall 1990, the DAB's final decision further demonstrated how much the choices had narrowed. It made no long-term choice, apparently due to the budget situation and Congress' apparent desire for a big flyoff test. Overcome by the exigencies of force reduction, the Air Force accepted the DAB's decision to modify approximately four F-16 wings and retain approximately two A-10 wings, whose planes would also be modified with LASTE and FLIR equipment. This was a sharp drop from the nearly seven hundred Hogs available, but at least the dedicated CAS plane survived the debate and the sharp force cuts then underway. (By this time, the service faced an imminent reduction of tactical wings to twenty.) Observers close to the scene then and later cited defense budget problems as the major cause. "It's an affordability issue," said Major General Joseph Ralston, then the director of tactical weapons procurement in the Air Force Pentagon's acquisition office. Still, given its outspoken promotion of the F-16 at the A-10's expense for the previous four years, service leaders could have insisted that multirole F-16s were

Russ and Welch said that time and money ran out for the A-7F. Phillips was at one time the Air Force A-7F program spokesman, and said that he "never could really figure out why it existed." He thought that it was the result of Texas congressional interest and the desire to create competition in the CAS plane selection process. He believed that the program had no real support—even the Air National Guard was unenthusiastic.

<sup>&</sup>lt;sup>33</sup>Barbara Amouyal, "Pentagon Expected to Assign Role of CAS to F-16," <u>Defense</u> <u>News</u>, 18 June 1990, 45 (mentions A-10 funding); Barbara Amouyal, "Prospects of A-7F in Air Support Role Appear Dim," <u>Defense News</u>, 8 January 1990, 29; Bond, "Defense Dept. Plans CAS Review," 31-33 (points out A-7 age problems); David Brown, "LTV Begins Flight Tests of Reengined A-7F for Air Guard Mission," <u>AW&ST</u> 131 (4 December 1989): 19-21; Fulghum, "Air Force Calls CAS Test Plan Redundant," 22 (quotes one congressional staffer's observation that the A-7F would at least get "its day in court"); and the following interviews by author: Farmer, Phillips, Russ, and Welch.

The Senate rejected John Tower's nomination for Defense Secretary amidst allegations of wild living and Texas defense industry influence peddling. Wright stepped down as Speaker due to ethics violations.

even more necessary in the smaller Air Force and rejected A-10s entirely. That they did not was probably because of people like General Russ who still wanted a mix of planes, as well as Congress and OSD's not so veiled desire for another CAS plane besides the F-16. Russ later observed that DABs normally made compromise decisions, and in this case, the DAB apparently opted for already operational planes which satisfied all sides to some extent. Although it wanted a big flyoff test, Congress did not object to the DAB's decision; but this may have been due to one other factor which no one at the time or later would admit drove the A-10's reprieve. That other factor was a potential real world assessment of air support aircraft—the Operation Desert Shield deployment to face the Iraqis.<sup>34</sup>

# Desert Shield's Initial Stages

Iraqi dictator Saddam Hussein sent his army into Kuwait on 2 August 1990. Three days later, President George Bush proclaimed Operation Desert Shield and ordered American troops to the Middle East to protect Saudi Arabia and possibly drive the Iraqis out of Kuwait. Although the Americans organized a large coalition of nations which augmented the American force and effectively isolated the Iraqis, Saddam did not back down. Weeks dragged into months as diplomatic initiatives and economic sanctions failed to resolve the impasse. President Bush ordered more forces to the region throughout autumn 1990.

<sup>&</sup>lt;sup>34</sup>Amouyal, "AF to Cease F-16 Buys," 1, 51; Barbara Amouyal, "Pentagon Panel Rejects F/A-16 for Air Force CAS Mission," <u>Defense News</u>, 3 December 1990, 3, 44; "Endless Saga," <u>AW&ST</u> 133 (10 December 1990): 19; John Morrocco, "Air Force Drops Plan for New F-16s, Will Modify F-16C/Ds for Close Air Support," <u>AW&ST</u> 133 (3 December 1990): 28; and the following interviews by author: Adams, Farmer, Rosa, and Russ.

Rosa worked with the DAB and said the following about its decision and the Air Force's reaction. At the time, Air Force Pentagon planners anticipated a reduction to twenty fighter wings, and funding both equipment upgrades and brand new CAS F-16s was impossible. As for the A-10, the DAB told the service to retain some of them, thus confirming Russ' observation that the DAB wanted a compromise solution.

Adams said that the service recognized the political importance of not contesting the DAB's A-10 decision. And as Amouyal's article makes clear, the DAB decision and further cuts crippled further extensive F-16 buys.

A-10 units formed part of this force, though at least one source claimed that the Air Force did not want to deploy Hogs. One version related how a few days into Desert Shield, the overall commander for coalition air forces, U.S. Air Force General Charles Horner, briefed the overall coalition commander, U.S. Army General H. Norman Schwarzkopf, on the air unit deployment. Schwarzkopf asked why no A-10s had arrived, and Horner supposedly replied, "Sir, we believe that our F-16s can do air support," or words to that effect. Fearing further advance by Iraqi troops from Kuwait, Schwarzkpopf allegedly shot back, "Skip the sales job, general, I want my A-10s!" Another had Defense Secretary Richard Cheney ordering a reluctant Air Force to send Hogs. Ironically, research reveals no basis for either. However, they are both understandable, given the service's four-year lobbying campaign for the CAS F-16.<sup>35</sup>

Schwarzkopf writes that in the initial stages he wanted "Combat troops and tank killing planes and helicopters!" (311), but seems pleased with Horner's deployment setup. He also adds that the whole deployment process was daunting. Anderson and van Atta make the claim about Cheney, and Pentland said that the Air Force did not initially plan to deploy A-10s on Desert Shield operations. However, Cheney recalled nothing about ordering anyone to deploy A-10s, though he was aware that the Air Force leadership was generally unenthusiastic about the Hog. Concerning the Schwarzkopf/Horner confrontation, Fialka claimed that Schwarzkopf ordered Horner to send A-10s. Fox, LTCOL Henry, and Swift recalled hearing the story, and Hallion called it a rumor in his Gulf War history. Fox said that Horner wanted A-10s; the difference with Schwarzkopf might have been in the timing of their arrival.

Several sources (non-interview) also told this author the story. Unfortunately, both Horner and Schwarzkopf were unable to respond to this author's queries about it and other matters. However, Welch contacted Horner on this author's behalf, and related that Horner did not recall any confrontation with Schwarzkopf or anyone else about deploying Hogs. GEN Henry served on Horner's staff and dismissed the story as false.

<sup>&</sup>lt;sup>35</sup>Jack Anderson and Dale van Atta, "The Hero that Almost Missed the War," <u>The</u> <u>Washington Post</u>, 5 March 1991, C9; Richard Cheney, telephonic interview by author, 31 March 1997, recording and notes in author's possession; Hallion, <u>Storm Over Iraq</u>, 210; John Fialka, "A-10 'Warthog,' a Gulf War Hero, Would Fly to Scrap Heap if Air Force Brass Has Its Way," <u>The Wall Street Journal</u>, 29 March 1991, A12; GEN Larry Henry, USAF (ret.), telephonic interview by author, 28 March 1997, notes in author's possession; GEN H. Norman Schwarzkopf, USA (ret.) and Peter Petre, <u>It Doesn't Take a Hero</u> (New York: Linda Gray Bantam Books, 1992), 311-312, 331; and the following interviews by author: Fox, LTCOL Henry (henceforth, the two Henrys will be specified by rank), Pentland, Swift, and Welch.

The Air Force deployed units to Desert Shield in a sequence which followed its doctrine. This made sense, since the Iragis had an air force with the latest Soviet- and French-made fighter and attack jets. As a result, some air superiority fighters and early warning planes deployed first, followed by some interdiction planes, and then some A-10s. However, Horner was concerned about Iraqi ground units poised at the Saudi-Kuwaiti border, and the time space between the first Air Force unit deployed and the first A-10s was ten days, not weeks or months. In Desert Shield's initial stages, there was nothing between the American bases and Iraqi forces but small ground units. Horner demonstrated just how anxious he was when The Air Campaign author and Air Force Pentagon planner, Colonel John Warden, and his staff briefed an air warplan proposal to him in August. Warden's plan reflected his philosophy, recalling Billy Mitchell, that well-orchestrated interdiction attacks could win the war single-handedly. Warden answered Horner's concern for stopping a continued Iraqi ground advance with such quips as, "Ground forces aren't important to [the] campaign," and "You are being overly pessimistic about those [Iraqi] tanks." Upset with what he perceived as flippant arrogance, Horner turned to a subordinate and stage whispered, "I'm being very, very patient, aren't I?" Horner kept the plan and sent its creator back to the Pentagon. His irritation recalled the Hog Driver maxim: "You can kill all the MiGs you want, but if you return to base and the enemy tank commander is eating lunch in your snack bar .... "<sup>36</sup>

This author believes that Schwarzkopf made some similar comment to Horner, but that it was due to his irritation at overall deployment progress. The theater commander's irascibility forms a subtheme of two of the more acclaimed war histories: Rick Atkinson, <u>Crusade: The Untold Story of the Persian Gulf War</u> (Boston, Mass.: Houghton Mifflin, 1993); and Michael Gordon and GEN Bernard Trainor, USA (ret.), <u>The Generals' War:</u> <u>The Inside Story of the Conflict in the Gulf</u> (Boston, Mass.: Little, Brown, 1995).

<sup>&</sup>lt;sup>36</sup>Atkinson, <u>Crusade</u>, 60-62; Gordon and Trainor, <u>Generals' War</u>, 92-94 (Warden's "tanks" quote, 93); Hallion, <u>Storm</u>, 116-118, 142-143, 150-151; COL Richard Reynolds, USAF, <u>Heart of the Storm: The Genesis of the Air Campaign Against Iraq</u> (MAFB: Air University Press, 1995), 120-130 (Horner quotes, and Warden's other quotes, 128); and COL David Tretler, USAF, and LTCOL Daniel Kuehl, USAF, <u>Gulf War Air Power</u> <u>Survey, Volume V, Part 1: A Statistical Compendium</u> (Washington, D.C.: GPO, 1993), 58-64 (unit deployment schedule); and the following interviews by author: Adams, Fox,

Also, the Air Force had to make hard choices about deployment order, because it could not deploy everything at once. Even though the initial deployment represented a fraction of the entire air component which later fought the war, all of the first air units to arrive encountered problems with air base availability and suitability. There was simply not enough support equipment to handle a large force arriving quickly.<sup>37</sup>

### and GEN Henry.

The <u>Gulf War Air Power Survey</u> will henceforth be cited as <u>GWAPS</u>, along with the subject of the particular part cited. Large teams consisting of task force chiefs, principal authors, and contributing authors participated in creating each part of the <u>GWAPS</u>, and in this work, only the task force chiefs will be cited.

Reynolds provides a blow-by-blow account of the briefing, while Atkinson, Gordon, and Trainor's versions are more general. All give the impression of an air commander unable to grasp the brilliance of Warden's plan. Hallion praises Warden, his book, and his plane; and glosses over any rift with Horner. The plan, by the way, revived the old strategic bombing concept of striking vital centers in a modern state first, and concentrating upon tactical goals such as air support later. As with God and His universe in the Book of Genesis, Warden's air campaign against Iraq was to last six days, with the seventh being a day to rest and admire the quick victory. Gordon and Trainor point out that Warden dismissed the Iraqi ground force because he thought that they lacked the ability and logistics support for an offensive into Saudi Arabia. GEN Henry said that Horner appreciated most of Warden's plan, which offered an efficient way to attack the Iraqi war machine. However, Horner did not like Warden's dismissal of contingencies, such as bad weather or an Iraqi ground advance against coalition bases in Saudi Arabia. GEN Henry added that Warden the planner could afford to think in theoretical terms, while Horner the commander could not.

Adams visited Horner's headquarters during Desert Shield's early days. He said that Horner told him he wanted the air superiority units first because of the Iraqi Air Force threat, and the attack units immediately thereafter to handle the Iraqi ground threat.

<sup>37</sup>Gordon and Trainor, 63-65; Richard Gunkel, "Deploying to the Theater," chap, in <u>GWAPS. Volume III. Part 1: Logistics</u> (Washington, D.C.: GPO, 1993), 81-140; GEN Henry, interview by author; Smallwood, <u>Warthog</u>, 20-35; and Barry Watts, <u>GWAPS</u> <u>Volume II. Part 2: Effects and Effectiveness</u> (Washington, D.C.: GPO, 1993), 18-19.

GEN Henry maintained that Horner wanted A-10s, but that the initial aircraft deployment was hectic enough without sending everything at the same time. Henry added that the planning scenarios for war against Iraq assumed American deployment *prior* to Iraqi action, and thus included Kuwaiti bases as deployment locations. These were obviously not available during Desert Shield.

Gordon and Trainor describe deployment problems for various American planes, and Smallwood focuses upon problems specific to the Hog units. The <u>GWAPS</u> also

Horner's concerns pointed up the absurdity of the Air Force argument for the past four years—not to mention the Army's AirLand Battle concept of warfighting. There *were* other wars besides the mythical, high-tech, aerial Trafalgar against the Soviets on the North German plain, and the service found itself contemplating one. The Army's slower deployment schedule *made* Horner and Schwarzkopf realize that the Iraqi war could begin *without* all of the armor, attack helicopter, and missile artillery goodies which supported AirLand Battle doctrine. In such a case, the A-10 and any other attack jet would be the available heavy firepower. Interestingly, postwar Air Force accounts criticized Horner, Russ, and other TAC generals as too blinkered by their commitment to air support to grasp the genius of Warden's master plan!<sup>38</sup>

The mobilization had its effect at home as well. There was yet another congressional hearing on close air support, this time by the Investigations Subcommittee of the House Committee on Armed Services. Like the 1989 hearing, it lasted only one day and featured only three witnesses, but this hearing's witnesses and attitude were more sympathetic to the mission and the dedicated planes that flew it. The Investigations Subcommittee Chairman, Congressman Nicholas Mavroules (D-MA), announced that whereas the 1989 House hearing focused more on CAS technology, he wanted to discuss

discusses initial deployment challenges and snafus. Watts writes that the outfits deploying first played air base musical chairs as the command shuffled deployment locations.

<sup>&</sup>lt;sup>38</sup>Gordon and Trainor, <u>Generals' War</u>, 62-74; 91(describe Horner and Schwarzkopf's fear of an early Iraqi invasion); and COL David Hackworth, USA (ret.) and Tom Mathews, <u>Hazardous Duty</u> (New York: William Morrow, 1996), 90 (damns Central Command's allowing ground forces to deploy without heavy firepower--though, given the logistical challenge of shipping such equipment halfway around the world, it is understandable to this author, at least).

The two Air Force histories are COL Edward Mann, III, USAF, <u>Thunder and</u> <u>Lightning: Desert Storm and the Airpower Debates</u> (MAFB: Air University Press, 1995), 30-36; and Reynolds, <u>Heart of the Storm</u>, 41-48, 73-83, 120-131. In one note, Mann describes the TAC generals' Army support orientation. It is a continuing theme in Reynolds' work. Specific "villains" in the latter are GEN Jimmie V. Adams, Horner, and Russ. Other works paint a similar but less detailed picture of lesser minds vexing Warden's air warfare genius; see, Atkinson, <u>Crusade</u>, 56-62; and Gordon and Trainor, <u>Generals'</u> <u>War</u>, 77-94.

the mission itself. However, both the panel members and the witnesses moved from considering mission philosophy to addressing CAS plane technology--especially when the witnesses pointed out that the mission required certain aircraft characteristics. Also, with the Desert Shield mobilization underway, the legislators asked what airplane *could best* stop all those Iraqi armored divisions. The ensuing discussion seemed to indicate that this was the A-10. Finally, panel member Andy Ireland (R-FL), and committee staffer Archie Barrett both publicly opposed the Air Force's F-16 tack, and it could be that the lawmakers wanted a hearing which highlighted this.<sup>39</sup>

Two of the witnesses definitely supported the CAS mission and dedicated planes. David Isby, a consultant with the Beltway consultancy BDM Corporation, stated that the mission remained important because of the United States' diverse world commitments and possible warfighting situations. Pointing out that the fixed-wing CAS plane was the one heavy firepower weapon that could deploy itself, he mentioned that the A-10 appropriately backed up the first Army units to deploy in Desert Shield. Recounting various historical instances where CAS decisively affected battles, he averred that "No general or admiral can permit a battle to be lost or avoidable casualties to be sustained through a reluctance to use fixed-wing close air support." As such, relying upon multipurpose planes for CAS denied the ground commander the potential for decisive firepower application on the battlefield. But Isby did not want only Mud Fighters or A-10s. He appreciated the "broad spectrum of firepower" which attack helicopters, A-10s, and other attack jets provided, and mentioned that this mix of air attack capabilities would vex Iraqi defenders. Isby guided the panel through a quick history of the Air Force and CAS, pointing out how the service

<sup>&</sup>lt;sup>39</sup>Casey Anderson, "Close Air Support: A-10 or F-16?" <u>Air Force Times</u>, 15 October 1990, 28 (indicates Mavroules and Ireland's opposition); and the following interviews by author: Christie, Ireland, and Isby.

Christie thought that Barrett and the panel members wanted him to appear and cite examples of Air Force bureaucratic skulduggery on the CAS F-16's behalf. Isby believed that the hearing was a reaction to the more pro-Air Force 1989 hearing, and that some members feared a loss of Air Force CAS expertise if A-10s were retired. Unlike Christie, Isby thought that the panel saw him as an independent witness. Ireland said that, to him, the Air Force's position made no sense, and that staffers like Charles Murphy reinforced his opinion.

had at times neglected the mission, and how the Army reacted by developing attack helicopters. He also described how both services embraced CAS and the A-10 during the late 1970s, and added that, though the Soviet air defenses were tough, they were not as strong as anticipated. In fact, Isby cited his Afghanistan visits as evidence that even the Stinger SAM could be defeated if air forces used good tactics and countermeasures.<sup>40</sup>

Tom Christie told the panel he had been associated with the A-10 from the 1960s, and that he agreed with Isby that a multi-role plane for CAS risked loss of expertise. He believed that the mission required a rugged plane which could loiter and carry large weapons payloads. In this, he described the A-10 without mentioning it specifically. Later, he claimed that he was uncertain about how much longer the Hog could usefully serve, but added that the Cold War's end certainly changed the criteria for determining its fate. The third witness was a former Vice Chairman of the Joint Chiefs of Staff, retired Air Force General Robert Herres. If the other two witnesses favored A-10s over F-16s, Herres presented the Air Force party line. He praised the Army's attack helicopters for providing some air support, but felt that the Air Force's fixed-wing planes provided a needed complement. Citing the Goldwater-Nichols Act's augmentation of a wartime theater commander's control, he praised the F-16 for giving that commander the flexibility to

<sup>&</sup>lt;sup>40</sup>Congress, House, <u>Close Air Support</u>, 101st Cong., 19 September 1990, 3-29 ("permit" quote, 6; and "spectrum" quote, 9).

Isby alluded to another conflict not so far covered in this work: the December 1989 Operation Just Cause invasion of Panama. The fighting was not extensive enough to require extensive fixed-wing air support, though Air National Guard A-7s as well as Air Force A-37 FAC planes and AC-130s flew patrols. Army helicopters saw more action, and Isby observed that a few Apaches suffered damage. Bradin, in his Hot Air to Hellfire, 157-172, recounts Apache fortunes. The first Apaches to deploy did so secretly via C-5 transports. Low numbers of Apaches and high demand meant that Apache pilots had to navigate in confused combat circumstances without defense suppression or mutual support. At least one Apache suffered serious damage due to small arms fire, but its survivability features allowed it to return to base safely. LTCOL Douglas Smith, USA, an Apache unit commander, wrote an Army War College research paper, "Army Aviation in Operation Just Cause" (1992). He listed the same casualties for Apaches, but added that other helicopter types suffered more serious damage, especially UH-60 Blackhawk transports. He was pleased enough with helicopter performance to exclaim, "Army helicopters ruled the night!" (119).

accomplish CAS or BAI with one air asset. In turn, he condemned the A-10 for its lack of speed and technological sophistication. To him, Air Force critics were lost "trying to solve a problem of the 'fifties." Army firepower technology and the theater commander's legal control over all of his units precluded neglect of the Army.<sup>41</sup>

In the ensuing panel discussion, Christie rebutted Herres, saying that the F-16 lacked the characteristics necessary for effective CAS. Congressman Ireland attacked Herres and the Air Force's desire for multi-role planes for CAS because "you end up doing neither [mission] well." When Herres tried to defend the service, Ireland dismissed his argument as a "kindergarten discussion." Ireland later asked former CASMARG member Christie if he had seen Don Fredericksen's memorandum to the Air Force CASADA study, (it requested that the CASADA study include traditional CAS plane requirements). When Christie said that he had not, Ireland asserted that this was because the Air Force ignored the memo and skewed the CASADA study's data to favor the F-16 (Christie suspected that one of the reasons the panel invited him was to discuss Air Force bureaucratic foul play). Herres believed that the Army's attack helicopters fulfilled the function of the traditional CAS plane and continued to criticize the A-10 as an aircraft imminently facing complete obsolescence. Mavroules questioned this assertion by citing the varied warfighting theaters around the world. Isby seconded this line of thinking, again pointing out that the A-10 currently provided much of the Army's heavy firepower in Desert Shield until that service received its own weapons. Further, Isby assured the panel that the A-10 could handle the Iraqis' air defenses.42

<sup>&</sup>lt;sup>41</sup>Congress, House, <u>Close Air Support</u>, 101st Cong., 19 September 1990, 30-40 ("fifties" quote, 39).

<sup>&</sup>lt;sup>42</sup>Ibid., 41-55 (quotes, 44). The other issue discussed in these hearings was transfer of the CAS mission and A-10 to the Army. Ireland considered this a serious option if the Air Force continued what he considered its poor attitude toward CAS. However, neither Christie nor Herres considered it a good idea.

There was another hearing at this time which briefly discussed air power's potential impact upon a war with Iraq. In it, retired Air Force GEN Charles Donnelly, former commander of U.S. Air Forces in Europe, appealed to Warden's air campaign concept, spoke only of F-15s, F-16s, and F/A-18s, and boasted about the F-16's weapons accuracy;

# The Hog Drivers Prepare for War

Isby's attitude about the Hog and the Iraqis was not an isolated confidence. In October 1990, Hog drivers told the <u>Air Force Times</u> that they hoped the deployment would serve as justification for keeping the plane. They believed that the Iraqi air defenses were no worse than any simulated air defense setup that they had faced in training exercises. At least one other publication noted the plane's potential. In its summary of deployed units and their weapons, <u>US News & World Report</u> noted that, though the Air Force had previously "dumped on the A-10" while pursuing F-16s, the service now praised it "as the close air support weapon of choice against Iraqi tanks."<sup>43</sup>

Within the deployed units, however, important changes were underway involving the A-10's traditional warfighting concept. By early September 1990, the 354th TFW at Myrtle Beach AFB, and the 23rd TFW at England AFB, Louisiana, had each deployed two squadrons to King Fahd Air Base in Dhahran, Saudi Arabia. At first, the Hog drivers thought they would employ the standard low level tactics to account for the Iraqi air defenses, which featured the latest radar-guided and heat-seeking missiles like the SA-8 and SA-14, and also radar-guided AAA such as the ZSU-23. However, the nature of the mission, the continued Air Force buildup, and the nature of the terrain dictated a modification of this approach. As time passed, it became obvious that the Iraqis would advance no further, and would instead defend their gains. This dictated a more offensive-minded fighting style featuring BAI missions instead of the conventional orientation toward attacking tank advances at the point of contact. Second, the lengthy deployment introduced air assets into theater which could suppress air defenses, whether these were enemy fighters or radar missiles and AAA. Finally, the terrain in Kuwait and southern Iraq was mostly flat and featureless, thus precluding any use of the terrain to

see Congress, House, Hearing before the Committee on Armed Services, <u>Crisis in the</u> <u>Persian Gulf: Sanctions, Diplomacy, and War</u>, 101st Cong., 2d sess., 12 December 1990, 363-365 (wartime altitude restrictions for weapons delivery degraded the latter).

<sup>&</sup>lt;sup>43</sup>Bruce Austen, and others, "Lessons from Desert Shield," <u>U.S. News & World</u> <u>Report</u>, 10 September 1990, 36 (first quote), 38 (second quote).

achieve surprise. Additionally, pilots complained that poor visibility due to blowing dust eliminated any horizon reference, which degraded their ability to judge height above the terrain anyway. Before the war started, air leader Horner and his chief planner, Brigadier General Buster Glosson, cemented the decision when they told all U.S. Air Force pilots that they wanted no heroics--there was nothing in Iraq worth senseless sacrifices. As such, they told their crews to trust the radar defense suppression effort--and *ordered* them to avoid low altitude attacks so as to avoid the small arms fire and AAA which historically accounted for most ground attack losses.<sup>44</sup>

There was some debate about whether the air planners wanted to hold the A-10s in reserve for potential CAS tasking instead of assigning them to fly BAI missions with other jets. Some A-10 pilots claim that this was so, though Glosson later said that his staff always planned to use A-10s at the start of hostilities. Either way, Hog drivers welcomed the opportunity to demonstrate their plane's abilities; though many initially questioned BAI missions, higher altitude attacks, and another initiative--night flying.<sup>45</sup>

Coalition planners aimed to conduct extensive night operations; the leaders of the two A-10 wings operating from King Fahd expected to participate as well. However, this was not an easy sell to the pilots, who were conditioned by many years of day air support

The minimum altitude was ten thousand feet AGL.

<sup>45</sup>Smallwood, <u>Warthog</u>, 66-70, 78-79. Smallwood reports that Glosson rejected the Hog Drivers' claim about initial reserve status when he reviewed his book. Glosson told Smallwood that the ground commanders wanted the Hogs held in reserve in case the Iraqis launched a ground attack when the air campaign started (so much for the pell-mell AirLand Battle). Glosson and Horner overrode their concerns.

<sup>&</sup>lt;sup>44</sup>Smallwood, <u>Warthog</u>, 38-41; and the following interviews by author: Fox, Koechle, Swift, and Wilson.

Smallwood's book is an excellent account of the A-10 in the Gulf War, mostly based upon very extensive interviews with the pilots who flew in it.

Koechle was an A-10 squadron weapons/plans officer, Fox and Swift were A-10 wing weapons/plans officers, and Wilson was an A-10 unit operations officer during Desert Shield. Koechle said that training safety considerations also contributed to the higher altitude tactics. There were some Desert Shield crashes attributed to the inability to properly judge one's altitude over the ground. Fox recalled that resistance initially accompanied the decision to attack from higher altitudes.

operations. Indeed, this was one of the CAS F-16 advocates' primary complaints against retaining A-10s, since the service had so far made no effort to upgrade Hogs with the latest night vision equipment. But the Hog drivers overcame their own initial opposition and improvised, for when they examined the issue a little closer, they saw certain advantages. Flying at altitude removed the concerns about terrain avoidance in darkness, and reduced defenses meant that the pilots could handle what remained without achieving nighttime flying task saturation. Indeed, they fashioned night formation procedures and tactics which closely resembled those used by A-1s in Vietnam! The Hog drivers innovated to solve the remaining problem of night target acquisition by using the infrared sensors on their Maverick missiles to locate likely targets. Though this was a primitive back-up method (the resolution and field-of-view were even more restricted than other planes' FLIR sensors), the fact that the Hogs would be flying BAI missions meant that they did not have to worry about hitting their own troops. When they found an enemy position, they illuminated it with flares and attacked it.<sup>46</sup>

Once the war commenced, the Hog drivers found that night operations provided one important benefit. The Iraqis could neither visually see them nor, with their quiet engines, hear them before they attacked. On the other hand, the Iraqis' gunfire was very visible, especially if they used tracers. This allowed the A-10s to locate and, if necessary, destroy these trouble spots during their missions. The day fighters had no such luck, and later there were complaints that, before the war started, the leadership did not work hard enough to repaint them in some less visible color. A-10s had nearly always been painted dark green, apparently both in anticipation of the big European war and to show "solidarity" with the Army. Proposals for changing this scheme came with one of the three other A-10 units deploying to King Fahd in late 1990 and early 1991--the Air Force Reserve 917th TFW from New Orleans. (The other units were the 511th TFS, which was part of the 10th TFW in RAF Alconbury, England, and the 23rd Tactical Air Support

<sup>&</sup>lt;sup>46</sup>Smallwood, <u>Warthog</u>, 69-71 (describes a spirited squadron discussion about this topic), 114-121; MAJ Kent Yohe, USAF, telephonic interview by author, 3 April 1997, recording and notes in author's possession (Yohe flew A-10 night missions in the war).

Squadron, an A-10 unit from Davis-Monthan AFB, Arizona. In keeping with the Air Force's plan for the Hog, the 23rd was a FAC outfit which used A-10s.) Some of the New Orleans pilots pointed out that a mottled gray paint scheme would better camouflage the plane from ground observers. The leadership of the two A-10 wings which formed at King Fahd addressed the issue, but it apparently became lost amidst the other war preparations as President Bush's mid-January 1991 deadline for the Iraqis to leave Kuwait approached. The Hogs remained dark green, which suited the night flyers but would not help the day operators.<sup>47</sup>

### The Real War

Called Operation Desert Storm, the war began on the night of 17 January 1991, and A-10s were among the first waves of aircraft attacking Iraqi positions. From that date to the 28 February end of the war, they flew eight thousand combat sorties while losing only six planes. To avoid false estimates of the Iraqi Army's condition, they conservatively estimated their mission effectiveness; and due to their lack of sophisticated targeting gear, the coalition staff devalued their claims even further. Still, they received credit for destroying 987 tanks, 926 artillery pieces, 501 armored personnel carriers, and 1106 trucks, among other targets. Indeed, after the ground war started, a two-Hog formation set a record for tank kills when it destroyed twenty-three tanks. As for the "other targets,"

<sup>&</sup>lt;sup>47</sup>Mann, "Senate Girds for Fight," 21; and the following interviews by author: Swift and Wilson.

Mann quotes GEN Russ as saying that CAS F-16s would be painted green to demonstrate their commitment to the Army. Wilson was one of the mottled gray paint scheme proponents. He said that he was told that gray would stand out on the black pavement during an air attack (interesting, because F-15s and F-16s were light gray); and also that allied troops were accustomed to seeing dark green A-10s and might shoot different colored Hogs. Swift recalled that the A-10 leaders explored the idea, but they believed the repainting evolution would take too long and consume too much manpower, given the increasing war preparation tempo.
A-10s knocked out Scud missile sites, SAM sites, and even shot down two helicopters. (These two kills surpassed the air-to-air kill total of one of the deployed F-15 wings!)<sup>48</sup>

The varied targets reflected the fact that Hogs flew other missions besides CAS in this war. Not only did this recall military technology historians' comments about weapons' unintended uses and consequences, but it also reflected this war's—any war's—special conditions. The Air Force successfully cowed most of the Iraqi air defense radars near the Kuwaiti border into not operating, allowing A-10s to roam more freely in that area and beyond (and without having to fly in high speed gorilla formations). The coalition needed a lot of air tasks accomplished, and the A-10 with its excellent loiter and weapons carriage capacity answered the call. Hog drivers often flew their mounts on three missions of roughly three hours duration daily. And since the coalition air leaders took advantage of the Hog's easy maintainability and flew A-10s from forward bases near the border, the

Smallwood writes that Schwarzkopf made very clear that he wanted no "body counts" (88) as in Vietnam. He wanted correct Iraqi strength estimates for his troops. However, he writes that one Air Force after-action report credited the A-10 with over half of the armor and artillery kills (206).

<sup>&</sup>lt;sup>48</sup>Statistics are courtesy of: Department of Defense, <u>Conduct of the Persian Gulf</u> <u>War</u>, Final Report to Congress (Washington, D.C.: GPO, 1992) 664-665 (this study will henceforth be cited as <u>CPGW</u>); Fred Frostic, "Air Campaign Against the Iraqi Army in the Kuwaiti Theater of Operations," RAND Project AIR FORCE #MR-357-AF (Santa Monica, Calif.: RAND, 1994), 48-51 (A-10 mission effectiveness numbers); and Tretler and Kuehl, <u>GWAPS: A Statistical Compendium</u>, (Washington, D.C.: GPO, 1993), 323 (sortie breakdown), 642-647 (coalition air attrition), 653-654 (air-to-air kills by unit; the F-15 wing was Langley AFB's 1st TFW).

The comparison to the F-15 wing is unfair, in that the Iraqi Air Force rarely got airborne against coalition fighters. Still, this author cannot resist it.

Estimating BDA (bomb damage assessment, the term normally used for mission effectiveness) was a sore point during and after the war. And though A-10 claims were devalued by two-thirds due to the plane's lack of sophisticated targeting gear, the issue applied somewhat to all other planes as well. See Atkinson, 232-236; Frostic, "Air Campaign Against the Iraqi Army," 37-38; Gordon and Trainor, 329-330; Hallion, Storm over Iraq, 244-246; Smallwood, Warthog, 88-91, 206; and Watts, <u>GWAPS: Effects and Effectiveness</u>, 209-220, 260-264.

None of the A-10s carried the more sophisticated LASTE targeting avionics in the war; the system was not developed in time. See "Desert Storm Performance Sparks Program to Extend Active Service of A-10 'Warthog," <u>AW&ST</u> 135 (22 July 1991): 44; and the following interviews by author: Fox and Swift.

loiter time over target during these missions was even greater. It was certainly better than the F-16s used for BAI missions—and the difference was even more glaring considering the weapons load. An average A-10 load during the war was six 500-pound bombs, either two or four Maverick missiles, and one thousand rounds of 30 mm ammunition. This compared quite favorably with the F-16's four 500-pound bombs and five hundred rounds of 20 mm ammunition.<sup>49</sup>

In the BAI missions, A-10s proceeded as directed to "kill boxes" in southern Iraq and Kuwait and attacked targets therein. When the Iraqis launched Scud long-range

Mission and weapons load data are from: Frostic, 1-23 (discusses phases of air campaign against Iraqis in Kuwait), 48-51; David Fulghum, "A-10s Find Targets Harder to Locate After Initial Easy Successes in Iraq," <u>AW&ST</u> 134 (11 February 1991): 23 (gorilla package comment); Dr. John Guilmartin, <u>GWAPS, Volume IV, Part 1: Weapons, Tactics, and Training</u> (Washington, D.C.: GPO, 1993), 48-49 (F-16 load data), 55 (A-10 load data), 82 (notes that at a slant range of 4,000 feet, a 30 mm round has fourteen times the kinetic energy of a 20 mm round); Thomas Keaney and Eliot Cohen, <u>GWAPS Summary Report</u> (Washington, D.C.: GPO, 1993), 229 (forward basing advantages); Smallwood, 85, 87, 126; and the following interviews by author: Condon, Fox, Houle, Kemp, Koechle, and Swift.

In addition to that given in the text, the Hogs' typical bomb load included a radar jamming pod, a full complement of chaff and flares for self defense, and two Sidewinder air-to-air heat seeking missiles just in case Iraqi fighters appeared.

Smallwood describes a rough average of three hours for A-10 missions while Guilmartin and company reports a precise 2.37 hours. On the other hand, Guilmartin details a 3.24 hour average sortie time for F-16s. Guilmartin's extra time for F-16s may seem to indicate that F-16s had better loiter times, but it fails to account for the air-to-air refueling the F-16s required to accomplish the missions. Likewise, the A-10s' shorter average time reflects the shorter distance from the two forward bases that the A-10s deployed to each day from Fing Fahd. These were Al Jouf (just over one hundred miles from the Iraqi border) and King Khalid Military City (KKMC; roughly fifty miles from Kuwait). King Fahd was nearly two-hundred miles from Kuwait. For forward base information, see "Fahd Squad A-10 Briefing," (14 May 1991), AFHRC Holding K417.054-176; and Smallwood, Warthog, 80, 92, and 147-158.

Intimidation of Iraqi air defenses is from Smallwood, <u>Warthog</u>, 106, 109, and 159; and the following author interviews: Fox, Koechle, and Wilson. Koechle wrote that the Iraqi radar SAM operators were not that competent.

<sup>&</sup>lt;sup>49</sup>Ballard, <u>Development and Employment of Fixed-Wing Gunships</u>; Gunston, <u>Attack Planes of the West</u>; and Mrozek, <u>Air Power and the Ground War in Vietnam</u> describe the unintended uses of combat aircraft. Rosen, <u>Winning the Next War</u>, discusses military innovation generally.

artillery missiles at Israel and Saudi Arabia, Hogs became the airplane of choice for the long hours spent searching for Scud launcher and stowage sites. As the historian of A-10s in the Gulf War, William Smallwood, observed, "They [the coalition air leaders] didn't want F-16s .... The F-16s would get out there and have a two-minute TOT [time over target]--and they still wouldn't know where the Scuds were." Using Hogs for Scud hunting paid off. Captain Mark Koechle and his wingman destroyed a storage site shortly after the Iraqis commenced their firings, thus providing some relief for a coalition leadership afraid of Israel's initial reaction and its implications for coalition unity. General Horner, who allegedly once wisecracked about his Hog driver son, "I think he died from brain damage," told his staff at this time: "I take back all the bad things I have ever said about the A-10. I love them! They're saving our asses!" Hogs also flew armed escort for combat search-and rescue (SAR) helicopters. This was a mission in which the A-1 excelled in Vietnam, because like CAS, the SAR helicopter escort role required attack planes with good loiter, lots of ordnance, and the ability to maneuver tightly to stay around the helicopter or to attack enemy defenders. The A-10 was the obvious successor, but the post-Vietnam attitude toward SAR was that it ended with that war-all future wars were supposed to feature too many air defense threats to allow friendly pilot pickup behind enemy lines. As with the A-10 itself, Desert Storm demonstrated that SAR was not dead vet. On 21 January, A-10s provided decisive defense suppression in the successful rescue of downed F-14 aviators.<sup>50</sup>

<sup>&</sup>lt;sup>50</sup>Frostic, "Air Campaign Against the Iraqi Army," 14-18; Guilmartin, <u>GWAPS:</u> <u>Weapons, Tactics, and Training</u>, 53-54; Hallion, <u>Storm Over Iraq</u>, 246-247 (diplomatically observes that in peacetime, SAR was one of the first missions "to feel the budget axe" [246]); Smallwood, "Scud Hunting," and "Warthogs to the Rescue," chaps. in <u>Warthog</u>, 91-99 (quotes, 96; Smallwood adds that the Horner's praise appeared the next day in the A-10 Battle Staff Directive), 102-110 respectively; Watts, <u>GWAPS: Operations</u>, 266-271; and the following interviews by author: Fox, Kemp, Koechle, and Yohe.

Fox said that it was harder for pilots who had flown only interdiction to fly CAS than for CAS pilots to adapt to interdiction. Guilmartin identified several missions the A-10s flew besides CAS in this war.

Earl Tilford records the A-1's SAR escort provess in his <u>Search and Rescue in</u> <u>Southeast Asia</u>, 66. However, Tilford is quick to note the A-1's difficulties with SAMs, and though he praises the A-7 which replaced the A-1 as SAR escort, he also concedes its

But the diverse missions did not stop there. Detachments from the first A-10 FAC outfits also served in the war, assisting not only the few available CAS missions but BAI Kill Box missions as well. As the date for the ground offensive neared, the coalition commanders needed better intelligence on Iraqi forces, and sent A-10s on low level reconnaissance forays deep into Kuwait to find out. And though the coalition air forces intimidated Iraqi radar SAM operators in Kuwait, many installations still remained to squeeze off the occasional pot shot at the planes overhead—as some Hog Drivers could attest. Thus, the leadership directed the Hogs to destroy these sites. They normally accomplished this mission using their Maverick missiles, which provided some stand-off capability and outstanding accuracy. Indeed, Hog drivers were the champion Maverick missile shooters in Desert Storm; their five thousand shots accounted for 90 percent of the Air Force's total Maverick usage. Accounting for the Hogs' two helicopter kills, A-10 historian Smallwood reports that Hog drivers jokingly called their ugly steed the "RFOA-10G," to denote all of its newly assumed missions.<sup>51</sup>

<sup>51</sup>Frostic, "Air Campaign," Guilmartin, <u>GWAPS: Weapons, Tactics, and Training</u>, 53-54, 70; David Hughes, "USAF Firing 100 Mavericks per Day in Current Air-to-Ground Mission," <u>AW&ST</u> 134 (11 February 1991): 24-25 (ironically, the article's picture shows an F-16); and Smallwood, <u>Warthog</u>, 81, 117, 125-126, 159-175; COL David Tretler, USAF, and LTCOL Daniel Kuehl, USAF, <u>GWAPS, Volume V, Part 2: Chronology</u> (Washington: GPO, 1993), 184 (defense suppression tasking for A-10s on 28 January signified the "birth of the 'wart weasel"--word play on the "Wild Weasel" designation for

problems due to speed and lack of maneuverability (73, 123-127). Writing in 1980, he concludes that there may be combat situations allowing SAR, but questions a SAR rescue force's ability to operate "in the highly defended open areas of Europe, *over the flat sands of the Middle East* [italics are this author's], or over the barren hills of Korea" (156). Granted, flying helicopters and slow planes deep into enemy territory is dangerous, but the U.S. values this mission as it values CAS. And as Hallion observes, SAR deficiencies were one of Desert Storm's "lessons."

In the 1970s and early 1980s, ex-A-1 pilots wrote papers predicting success for the A-10 in the SAR role; see Bennett, "Can the A-X Adequately Replace the A-1?"; MAJ Ronald Furtak, USAF, "The A-10 in the Rescue Escort Role: Tactics and Techniques" (Research study, Air Command and Staff College, 1975); and MAJ Charles Kasbeer, USAF and MAJ Thomas Lyon, USAF, "The A-10 Pilot SAR Handbook" (Research report, Air Command and Staff College, 1981). Lyon was a deputy commander of one of the Desert Storm A-10 wings.

However, the Hogs' spectacular success and ever more daring assignments bred an aggressiveness not only among A-10 pilots but also within the coalition air command. The attacks had been so successful that pilots encountered difficulty finding undamaged targets. Thus, the coalition air leaders lowered A-10 attack altitudes on 31 January to facilitate target acquisition. However, attack altitudes also meant that enemy gunners also had a better chance to find and hit A-10s-between that and the fortunes of war, one had to expect losses. Already, one A-10 fell on 25 January, and since Desert Storm's first day, a few pilots had brought back A-10s with repairable battle damage. Indeed, the Hogs were proving the wisdom of their ruggedness features during this time. The Hog driver who led the successful SAR effort to save the F-14 pilots, Captain Paul Johnson, later brought a plane home with much of its right wing shot away. On a couple of other occasions, the plane's redundant flight control system allowed crippled planes to fly home. Aircraft Battle Damage Repair (ABDR) crews repaired in-theater all but one of the estimated seventy damaged A-10s--and of those, twenty suffered significant damage. These repairs were usually quick, and involved using cheap, accessible material to complete. In one case, an ABDR team used a broomstick to replace a flight control rod! Through mid-February, the A-10's loss rate compared most favorably with, for example, the Marines AV-8 Harrier, which paid the price of survivability feature neglect predicted by Don Fredericksen.<sup>52</sup>

<sup>52</sup>"Air Force Pilot Tests A-10's Toughness in Battle," <u>AW&ST</u> 135 (5 August 1991): 43; Eliot Cohen and Thomas Keaney, <u>GWAPS Summary Report</u> (Washington, D.C.: GPO, 1993), 21 (says that Glosson lowered the altitude in part to give the GAU-8A a better chance to destroy targets; the new restriction was between 4,000 and 7,000 feet AGL); Congress, Senate, <u>DoD Authorization for FY 1989, Pt. 4</u>, 48-49 (Fredericksen discusses Harrier vulnerability problems), 64 (Marine GEN Sullivan says that Harriers will survive due to speed and maneuverability); Frostic, "Air Campaign," 43-44; Fulghum, "A-10s Find Targets Harder to Locate," 23; David Fulghum, "Senate Panel Backs Marine

the flak suppression mission); and the following interviews by author: Fox, Kemp, Koechle, Swift, and Wilson.

For the A-10 FAC role, see Frostic, "Air Campaign," 35-36; Guilmartin, <u>GWAPS:</u> <u>Weapons, Tactics, and Training</u>, 221; and Smallwood, <u>Warthog</u>, 68-69.

The "R" stood for reconnaissance, the "F" stood for air superiority fighter, the "O" stood for observation (FAC), and the "G" recalled the F-4G Wild Weasel defense suppression planes.

Battle damage incidents mounted with the restriction change. However, Horner and Glosson were buoyed enough by the A-10's success and survivability to send Hogs ever deeper into Kuwait to attack the heart of the Iraqi military machine, the Republican Guards divisions. Initial strikes against the Tawakalna Division went well enough, but on 15 February, a flight of two A-10s fell during their attacks on the Medina Division. These losses upset the A-10 commanders, one of whom observed in a message to Horner that F-16s were attacking targets south of the A-10s' target sets. Horner responded by restricting A-10 operations to southern Kuwait, and the A-10 leaders seconded the coalition air commander by restricting gun usage to SAR and CAS missions. These were wise moves, if one accepts that the coalition wanted to eliminate the chance for air casualties as much as possible; and that one could do this by using other aircraft such as the F-16 and different weapons such as the Maverick missile. However, these restrictions did not end A-10 losses in combat. Also, a reading of the shootdown and battle damage pilot accounts reveals that A-10 pilots were becoming more aggressive. This author will not impugn these pilots' combat airmanship, because aggressiveness is a part of war, and sometimes it works and other times it does not. One does not claim that the A-10 was a machine for high-threat interdiction missions, but thanks to successful defense suppression the plane had so far flown BAI missions with loss rates no worse than that of other aircraft. (There was also the issue of the paint scheme, which some A-10 pilots claimed made them easier for gunners to locate.) Some Hog drivers grumbled about the restrictions then and

Corps' Postwar Upgrade Plan for AV-8B Harrier," <u>AW&ST</u> 135 (5 August 1991): 44-45; Breck Henderson, "A-10 'Warthogs' Damaged Heavily in Gulf War but Survived to Fly Again," <u>AW&ST</u> 135 (5 August 1991): 42-43; "Pentagon Gave Short Shrift to Improving Older Aircraft to Save Pilot Lives," <u>AW&ST</u> 135 (5 August 1991): 45; Smallwood, <u>Warthog</u>, 131-135, 140-141, 157-158, 163-167, 190-192, 200-202 (the last page citation describes a fatal landing mishap which killed a pilot flying his crippled A-10 home--not all of the A-10 battle damage stories ended well); Tretler and Kuehl, <u>GWAPS:</u> <u>Statistical Compendium</u>, 642-647; Tretler and Kuehl, <u>GWAPS: Chronology</u>, 160-210; and Barry Watts, <u>GWAPS. Volume II. Part 1: Operations</u> (Washington, D.C.: GPO, 1993), 280 (describes lowering of altitude restrictions and battle damage consequences).

later, while others welcomed them. Either way, the A-10 commander's letter and the ensuing restrictions formed the foundation of criticisms against the A-10 in later accounts.<sup>53</sup>

By this time, however, the coalition ground offensive was about to commence, giving the A-10 pilots a chance to fly their primary mission of CAS. So far, CAS opportunities came via occasional calls to terminate Iraqi shelling along the front lines, and more prominently, during the 29 January Iraqi incursion at the Saudi Arabian border town

Two of the A-10's six losses were FAC planes. These aircraft did not operate in formation, which denied them the added protection of a wingman who could possibly call out threats; see Frostic, "Air Campaign," 36; Tretler and Kuehl, <u>GWAPS: Statistical</u> <u>Compendium</u>, 651; and Smallwood, <u>Warthog</u>, 183-185, 200-202.

All of the A-10 pilots interviewed felt uneasy about criticizing any fallen comrade's tactics and abilities. For example, they thought that flight lead CAPT Steve Phyllis justifiably risked his life attempting to save his downed wingman in the 15 February double shootdown. (Phyllis was shot down and killed.) However, they agreed that aggressiveness was a likely factor in many of the battle damage/shootdown cases. They had mixed opinions about the Kuwait restriction, but disliked the gun restriction. The apparent intention was to prevent pilots from pressing gun attacks, but one could still use it at the higher altitudes. Two of those interviewed listed the paint scheme as partial cause of the losses, and one cited the Iraqis' use of the term "black jet" for the A-10 as proof. This author does not want to use specific interviewee names due to the topic's sensitivity.

As for the other sources, Atkinson blames the losses on Horner, and especially on Glosson, for allowing the attacks to proceed in the first place. Watts' assessment is more balanced. He points out that Horner thought that sending A-10s further north was worth the risk. After the losses occurred, Horner accepted the restrictions because he had other fighters such as laser guided bomb-equipped F-111s doing high-altitude, high-speed attacks on Iraqi tanks. Smallwood's account has the flight in question duelling with a SAM site that had shot at them-a sure sign of aggressiveness. He also points out that CAPT Paul Johnson was so upset with the over-aggressiveness that led to his Hog losing part of its wing that he slammed his helmet on the ground after landing. Smallwood also writes that the Hog driver response to the restrictions was mixed. Hallion, no friend of the Hog, will be discussed later.

<sup>&</sup>lt;sup>53</sup>Atkinson, 310-314; Frostic, "Air Campaign," 44; Hallion, <u>Storm over Iraq</u>, 210-211; Williamson Murray, <u>Air War in the Persian Gulf</u> (Baltimore, Md.: The Nautical & Aviation Publishing Company of America, 1995), 188, 258-259 (Murray was Watts' principal author in <u>GWAPS</u>: <u>Operations</u>, and used much of his <u>GWAPS</u> work in this book); Smallwood, <u>Warthog</u>, 124-126 (success against the Tawakalna Division), 176-185; Watts, <u>GWAPS</u>: <u>Operations</u>, 279-280 (reports that A-10s had suffered three battle damage incidents prior to Glosson's altitude restriction change, and suffered six between then and the 15 February shootdowns).

of Khafji. A-10s acquitted themselves well during this fight, but one A-10's Maverick missile malfunctioned and accidently hit friendly troops. When the coalition ground advance began on 24 February, General Horner lifted the previous altitude restrictions, telling A-10 commanders that:

the ground war starts tomorrow and there will soon be something up there worth dying for .... That's the time to hang it out if you have to, but just don't do anything foolish .... You've been down in the mud all along and I'm in awe of what your guys are doing with that airplane. So I know you'll do the job that has to be done when the friendlies need you.

As the A-10 unit chronology and subsequent <u>Gulf War Air Power Survey</u> put it, the Hog was now "in its element." The lower altitudes meant that Hog Drivers could use the GAU-8A gun at ranges where it was most effective. This was the time that two Hog drivers, Captain Eric Salmonson and First Lieutenant John Marks, used both Maverick and gun to set the record for tank kills. Further, the ground advance reduced (but certainly did not eliminate) the defenses the Hogs faced. Warthog historian Smallwood also recounted several cases where the plane's ability to operate in marginal weather helped coalition ground units; bad weather and burning oil wells made this capability mandatory (though the weather got so bad that it also affected A-10 operations). A-10s sometimes removed potential Iraqi Army "obstacles" such as tank and artillery units before the ground forces arrived. In one case, Lieutenant Colonel Jack Shafer and Captain Tom Atkins used their GAU-8As to maul a defensive line of T-72 tanks. (They not only killed enemy armor but CAS plane debate assertions that the GAU-8A could not kill the latest model Soviet tanks.) The Hogs' success was so overwhelming that the A-10 command's daily situation report for 25 February ended with the sentence, "Having a wonderful day." The captured executive commander of an Iraqi regiment described the Hog's success even better:

The single most recognizable and feared aircraft was the A-10. This black colored jet was deadly accurate, rarely missing its target. Seen conducting raids three and four times a day, the A-10 was a seemingly ubiquitous threat. Although the actual bomb run was terrifying, the aircraft's loitering around the target area prior to target acquisition caused as much, if not more, anxiety since the ... soldiers were unsure of the chosen target.

Though CAS opportunities remained fleeting even during the ground war due to the coalition armies' overwhelming success, their performance and capabilities impressed General Schwarzkopf enough that he used A-10s for top cover during the truce talks. The Warthog had done well in this war, finishing with a good reputation--or so it seemed.<sup>54</sup>

Watts' <u>GWAPS</u> account cited Horner as saying: "There are people's lives depending on our ability to help them . . . . So I want a push on. I want people feeling compulsion to hit the target" (296).

There were three other friendly fire incidents involving the A-10, and the worst occurred when a two-plane formation attacked a British armored unit and killed some soldiers. Confusion existed between the ground FAC and pilots about how far the British troops had advanced.

Fratricide was not restricted to the A-10, however. Of the 28 Gulf War friendly fire cases, 16 were ground-to-ground incidents. A event which also gained notoriety involved an Apache which shot a U.S. Army vehicle, killing its occupants. Fratricide remains a problem in CAS due to its nature-but it has been a factor in warfare since ancient times. For fratricide issues in the Gulf War and in general, see AH-64 Apache, "Wings" series, produced and directed by Daphna Rubin, Discovery Channel Productions, 1995, videocassette: Atkinson, 207, 210, 314-320, 380, 433, 462, 464; Congress, Office of Technology Assessment, Who Goes There: Friend or Foe? OTA-ISC-523 (Washington, D.C.: GPO, 1993), 27 (tallies the Gulf War incidents); Frostic, 41-43; LTCOL James Hillman, USA, "Task Force 1-41 Infantry: Fratricide Experience in Southwest Asia" (Study project, Army War College, 1993), 2-3, 21-25, 34-35 (explains Apache incident, which occurred at night; target was beyond the resolution capability of thermal sight); MAJ L. Michael Ritchey, USAF, "Technological Solutions to the Problem of Fixed Wing Air-to-Ground Fratricide, Do They Address the Fundamental Causes?" (Master's thesis, Army Command and General Staff College, 1993), 42-44, 110-112 (concludes that no individual technological device will solve the problem; the answer is a combination of devices such as GPS, lasers, and good training); and Charles Shrader, "Friendly Fire: The Inevitable Price," Parameters 22 (Autumn 1992): 29-44 (outstanding piece; cited by Hillman and Ritchey).

<sup>&</sup>lt;sup>54</sup>Atkinson, 2 (A-10 top cover for peace talks); Battlefield & Armor/Anti-Armor Assessment Teams, "Armor/Anti-Armor Operations in Southwest Asia," Marine Corps Research Center Research Paper #92-0002 (Quantico, Va.: The Marine Corps Research Center, 1991), 34 (henceforth cited as "Armor/Anti-Armor"); Frostic, "Air Campaign," 24-25 (observes that Hogs did not fly much CAS in the ground war due to the collapse of the Iraqi will to resist), 49 (reports that the Iraqis called the plane the "black jet"); Keaney and Cohen, <u>GWAPS Summary Report</u>, 72 (weather still affected A-10 operations); Smallwood, <u>Warthog</u>, 128-131, 188-205 (Horner quote, 188; Khafji and ground war accounts; covers fratricide incidents); Watts, <u>GWAPS: Effects and Effectiveness</u>, 237-247; Watts, <u>GWAPS: Operations</u>, 296-307 ("element" quote, 306); and the following interviews by author: Fox, Kemp, Koechle, Swift, Wilson, and Yohe.

## Assessing the Real War

The Hog enjoyed favorable press coverage both during and after the war. In the Air Force Times article on the Hog during Desert Shield, Hog drivers acted hopeful about their expectations, but the war's fortunes sparked fiercer displays of pride as well as blunt opinions of the Air Force's treatment of the plane. "The A-10 has been the red-headed stepchild of the Air Force," Lieutenant Colonel Danny Clifton told reporters, "Others see us as second-class citizens. We don't see it that way." Another pilot summarized the Hog's success thusly: "It's the A-10's day in the sun." The mainstream press paid more attention to CAS planes this time. Just as the war ended, The Washington Post's investigative reporting stars, Jack Anderson and Dale van Atta, wrote a short piece entitled "The Hero that Almost Missed the War." The team quoted Horner's "They're saving our asses!" outburst, and described how the plane's design helped it succeed. John Fialka of The Wall Street Journal went further, using Pierre Sprey to comment about the plane's development. Fred Kaplan of The Boston Globe did the same, and also cited the influence of Avery Kay, Richard Yudkin, Bob Dilger, and James Schlesinger. Aviation Week & Space Technology carried a couple of articles praising the Hog's durability and announcing that its war performance guaranteed it operational survival and equipment upgrades.<sup>55</sup>

Commenting upon the Apache Gulf War fratricide incident, the Discovery Channel production gave a fitting epitaph about technology and fratricide: "It is a byproduct of the modern age. Tools that are meant to ease the pilot's workload act usually complicate it; and the time these tools bequeath him is simply filled with new tasks." Frostic observed that many of the Gulf War air-to-ground incidents involved smart weapons operating at or beyond the range necessary to identify the target. This gives some counterpoint perspective to retired MGEN Perry Smith's assertion in the 1989 House CAS hearings that remotely piloted vehicles would do CAS in the future.

<sup>&</sup>lt;sup>55</sup>Anderson and van Atta, "The Hero that Almost Missed the War," C9; "Desert Storm Performance Sparks Program," 44 (says that LASTE modification will be put on all Hogs, with GPS, FLIR, and night vision goggles [NVGs] probably to follow); Fialka, "A-10 'Warthog,' a Gulf War Hero, Would Fly to Scrap Heap," A12; Henderson, "A-10 'Warthogs' Damaged Heavily," <u>AW&ST</u>, 42-43; Alexander Higgins, "Tank-Killing 'Warthog' Proves Itself," <u>The Huntsville [Ala.] Times</u>, January 1991, 1A; Fred Kaplan, "Beast of Battle, The Tale of the Warthog: How the Military Bureaucracy Almost Grounded a Gulf War Hero," <u>The Boston Globe</u>, 21 July 1991, 12; and Joby Warrick,

Others gave the Hog more mixed reviews. For all of his enthusiasm for the Hog during the war, Horner did not include A-10 pilots in the representative group of aviators that he brought to his postwar appearance before Congress. Senator John McCain (R-AZ) seemed concerned that some observers concluded that the A-10's success meant that cheaper weapons systems could have won the war. Horner agreed that this was wrong, and added the A-10 itself possessed complex systems such as the INS and weapons such as the Maverick. He praised the F-16's flexibility, but failed to mention the utility function that the A-10 accomplished—thus freeing planes like the F-16 for other missions that the A-10 could not do. Instead, he dwelt upon the 15 February losses and the wing commander's complaint about F-16 versus A-10 tasking in Kuwait. At this, McCain denigrated the Hog and CAS by saying that it could not perform the "very vital roles" that other aircraft flew. Horner at least replied that he had "great admiration for the A-10, [and] the job it did"; but he added ominously that it must be retired as it got old.<sup>56</sup>

Perhaps due to concern that the Hog's Gulf War success might lead Congress or OSD to want more A-10s than the 1990 DAB prescribed, one of the first major official studies of the war seemed to follow the Air Force line used in the CAS plane debate. DoD's 1992 <u>Conduct of the Persian Gulf War</u> report tried to be fair to the Hog and its pilots, as it lauded the plane's ability to handle diverse missions such as SAR. It also praised the plane's durability, but criticized its slow speed and recommended that any future CAS plane fly faster. Further, it analyzed the Hog's performance using two themes

<sup>&</sup>quot;Air Force Steps Up Attacks of Iraqi Troops," Air Force Times, 11 February, 1991, 8.

The <u>Huntsville Times</u> article cites Clifton for all of the given quote while the <u>Air</u> <u>Force Times</u> article cites him for part of it. The "day in the sun" quote is attributed to an anonymous aviator in both articles.

<sup>&</sup>lt;sup>56</sup>Congress, Senate, Hearings before the Committee on Armed Services, <u>Operation</u> <u>Desert Shield/Desert Storm</u>, 102d Cong., 1st sess., 21 May 1991, 275-276 (quotes, 276; Horner finished his response by pointing out that his son flew the plane). Burton, in <u>The</u> <u>Pentagon Wars</u>, 241-243, observes the same thing about Horner and the Air Force's attitude toward the Hog, commenting that "After the war was over, however, the Air Force A-10 lobotomy took effect" (242).

also seen in later studies: the need for more precision guided ("smart") weapons and night fighting capability.<sup>57</sup>

Any study of the Desert Storm air war was correct to focus upon smart weapons, for these devices generally did well and rated further development. As for the A-10, the DoD report focused upon the Hog drivers' success using Maverick missiles. Hog drivers fired 90 percent of the Mavericks used in this war; and studies as well as interview sources revealed that the pilots liked the weapon's high accuracy and lethality at the long ranges dictated by threats and altitude restrictions. The infrared imaging (IIR) Mavericks served not only as weapons but as night vision devices for the night A-10s. A-10 Scud killer Mark Koechle's letter to this author reported that the "Maverick was awesome .... There was NO [capitalization in the original] substitute for IR Mavs [*sic*] at night."<sup>58</sup>

However, in so doing, this report foreshadowed some later ones in that it dismissed the gun as virtually useless due to the altitude restrictions. This was due in part to the conservative BDA estimates in force during the war, and these especially applied to gun shots. Armored targets had to be observed burning or exploding in a bona fide "K-Kill." The Maverick had a warhead large enough to guarantee this result, but the GAU-8A's bullets often impacted without doing so. Armor piercing rounds were not explosive per se; they penetrated armor and wreaked havoc inside. One had to admit that the long firing ranges engendered by the altitude restrictions decreased the GAU-8A's effectiveness; but Hog Drivers reported hit and smoldering tanks which they did not count as destroyed because they did not see fire or explosions. Mark Koechle reported that some of his gun shots at these distances still made tanks explode. Other shots would make the tanks "start

<sup>57</sup><u>CPGW</u>, 138-139.

<sup>58</sup><u>CPGW</u>, 138-139, 664-665; and the following interviews by author: Condon, Fox, Kemp, Koechle, Swift, Wilson, and Yohe.

The <u>CPGW</u> makes much of the "tank plinking" by F-111 interdiction fighter bombers. Each F-111 carried four laser guided bombs which they dropped on Iraqi tanks from high altitude, using infrared night vision gear to identify the tanks for laser tracking.

Many of the interviewees said that they wanted to carry Maverick missiles even before the war, just in case conditions allowed proper aiming. The war made them more enthusiastic about the missile. to smolder and smoke and finally there would be secondaries from . . . [the] ammo." Smallwood wrote that when the Hog drivers fired their guns at tanks at closer ranges, they got better results. Finally, the issue of which coalition weapon destroyed what tank became so muddled that the Army's BRL gave up trying to assign credit during its postwar study of tanks left on the battlefield. As with the tanks that Dr. Russel Stolfi examined on the Arab-Israeli war battlefields, advancing armies shot any enemy tank that did not appear completely destroyed, thus confusing the issue of whether air or ground forces hit it.<sup>59</sup>

The DoD report also criticized the A-10's lack of night capability--but A-10s proved themselves at night. As anticipated, their quiet engines and dark color made them invisible to any Iraqi gunner lacking radar, and the Air Force lost no A-10s during night operations. True, Hog drivers had to use their IIR Mavericks to obtain a primitive night-vision capability. And sometimes they returned to base without using all of their weapons because they could not locate targets as they could during daytime. Still, the

<sup>&</sup>lt;sup>59</sup>"Armor/Anti-Armor," 18; Frostic, "Air Campaign," 51 (gun loss of accuracy assertion); MAJ Koffinke, Jr., USA, "US. Army Battle Damage Assessment Operations in Operation Desert Storm, Volume I," Technical Report BRL-TR-3408, (Aberdeen Proving Ground, Md.: BRL, 1992), 1, 16, 19; Robert Pape, <u>Bombing to Win: Air Power and Coercion in War</u> (Ithaca, N.Y.: Cornell University Press, 1996), 249-251; Smallwood, <u>Warthog</u>, 88-89, 110-111, 195-197, 206; Watts, <u>GWAPS: Operations</u>, 155 (loss of accuracy); and the following interviews by author: Condon, Fox, Kemp, Koechle, Swift, Wilson, and Yohe.

Fox said that the gun was hardly used due to the altitude restriction, and believed that pilots would have to press their attacks to get results. Yohe's observations matched Fox's, though Yohe used the gun a lot. Condon said that the gun seemed to work better against older tanks. Kemp's account agreed with Koechle's, in that he said that the gun could destroy tanks at the longer ranges. Smallwood and Swift pointed out that kill estimates were very conservative. Smallwood observed that the higher altitudes allowed steeper dive attacks which enabled the 30 mm rounds to strike the tanks' less heavily armored tops.

To give some idea of the tank BDA muddle, Pape cites both Army and Marine after-battle studies to claim that air power accounted for only 20 percent of the total Iraqi vehicles destroyed in the war. True, the Marine study claims the vast majority of kills in its sector came via ground weapons, but the BRL report states that "the majority of Iraqi equipment was engaged multiple times, both during and after the cease fire [the latter case due to the coalition's desire that all Iraqi equipment left behind be unusable]. Determining primary defeat mechanisms . . . was virtually impossible given these conditions" (19).

Maverick improvisation and illumination flares guaranteed Hog drivers some success. The report did not add that these deficiencies were due to the Air Force's neglect of the A-10 in favor of giving the CAS F-16 night-vision equipment.<sup>60</sup>

The most egregious attack on the Hog's Desert Storm record came via its CAS debate academic nemesis, Richard Hallion. Apparently feeling that he had to justify his negative prewar assessment of the plane, Hallion painted its performance in the worst possible light in his 1992 work, Storm Over Iraq. His summary description of the Hog's weapons dwelt upon the GAU-8A gun's developmental problems and followed the DoD report in emphasizing the Maverick's importance. As for the Hog itself, he acknowledged that it received a lot of attention as the Cinderella plane which overcame its own service's contempt. However, he quickly added that the Air Force justly denigrated it because of "legitimate questions about its survivability" against modern defenses. "Historically, the fighter-bomber had always proven a more survivable airplane than the special purpose battlefield attacker," Hallion assertively concluded. Did the Gulf War prove its worth and enduring value? Hallion gave a "strong yes" for the first part of the question and a "disturbing no" for the second part. Citing a Hog driver letter expressing concern about missions in north Kuwait, he stressed the operational cost in battle damage and aircraft losses. Pointing out that two A-10s were shot down in one day, he declared that losses would have been much higher had the Hogs continued low level attacks.<sup>61</sup>

Hallion's approach raised the issue of what he said and did not say about other airplanes' fortunes. Heaping fulsome praise upon the F-111s' "tank plinking" BAI missions, he observed that they enjoyed more armor kills per sortie than the A-10s. This again raised the issue of tank kill claims. Video of a 500-pound smart bomb hitting a tank guaranteed confirmation versus 30 mm shells sprinkling around a tank with no big explosion. Second, both the A-10 and F-111 were single-mission planes, but ironically,

<sup>&</sup>lt;sup>60</sup><u>CPGW</u>, 665; Smallwood, <u>Warthog</u>, 70-71, 114-121; and the following author interviews: Koechle and Yohe.

<sup>&</sup>lt;sup>61</sup>Hallion, <u>Storm Over Iraq</u>, 210-211, 284-285 (all quotes, 210). Hallion fairly recounted the fratricide incidents involving the A-10 and other planes; see pages 221-223.

Hog drivers found themselves assigned to far more diverse missions than attacks upon armor. Third, Horner was so concerned about reducing the Iraqi tank complement prior to the ground war that he willfully diverted every F-111 with this laser guided bomb capability from the strategic interdiction campaign to tank plinking. However, Hallion did discuss flaws in his favored jet, the F-16. He admitted that the small, high-performance fighter had limited range without tanker support and carried a limited payload regardless. He also pointed out that too much faith was placed in its ability to drop bombs accurately. It did well with deliveries at lower altitudes during peacetime, but the combat restrictions' high release altitudes exceeded even its fire control computer's ability to conduct pinpoint bombing. (Also, its gun pod was useless, due to vibrations encountered during firing on the few occasions F-16s carried it.) Unsaid in the observation about high altitude bombing was the Air Force's tacit admission that no plane could go fast enough to beat heavy AAA and small arms fire-as the service claimed during the CAS plane debate. In this regard, Hallion failed to mention that two F-16s fell in one raid on Baghdad. Perhaps this was because it proved that the air defense "level of pain" could be elevated to unbearability for even the vaunted F-16. (General Horner then pulled F-16s from Baghdad raids just as he pulled Hogs from north Kuwait.) Another unspoken discrepancy was that F-16 pilots did not use the Maverick as the Hog Drivers did because they had seldom practiced using it, and had few missiles available. Last, though their maintenance availability was impressive, the F-16s also encountered problems with airborne reliability. During the war, five went down due to "other" causes; one of which was an engine failure over southern Iraq. Hallion also ignored the Harrier's problems. In his 1989 book, Strike from the Sky, he praised the potential offered by the Harrier; and in Storm Over Irag, he stuck to discussion of its potential. He did not recount that as the ground advance date approached, the Harriers also flew at lower altitudes and suffered the loss of five planes due in part to lack of survivability features built into the plane. As in Korea and as in Vietnam, yet another fighter proved that speed was no complete antidote to thick AAA and SAMs.<sup>62</sup>

<sup>&</sup>lt;sup>62</sup>Fulghum, "Senate Panel Backs Marine Corps' Postwar Upgrade Plan for AV-8B Harrier," 44-45; Frostic, "Air Campaign Against the Iraqi Army," 17 (the Marines held

Hallion's observations also bring up the AH-64 Apache's performance as well as the anticipated and real execution of AirLand Battle doctrine. Hallion praised the Apache's performance in general terms, but other studies provided the details. Except for a dramatic first-night raid on Iraqi radar facilities, the Army did not allow its Apaches to conduct any serious attacks until the ground war began. After that, Apaches conducted attacks out front of friendly forces and destroyed many Iraqi vehicles in the war's last two days (there were also some productive JAAT operations with A-10s). One report on Apache Desert Storm operations complained that lack of good intelligence and planning hobbled Apache

The defenses that the F-16s encountered around Baghdad were what the Air Force said during the CAS plane debate would exist in a war with the Soviets in Europe. This raises the question of what plane *could* have survived the maelstrom of metal while flying BAI missions.

The AC-130 gunship was a plane whose air defense level of pain began just beyond enemy lines. Early in the war, it enjoyed some success doing night attacks, especially in conjunction with A-10s. However, AC-130 Scud hunt missions deeper into enemy territory led to one gunship suffering serious damage and subsequent removal of AC-130s from these efforts. Later, an AC-130 supporting the repulse of Iraqi forces at Khafji was shot down with the loss of fourteen aircrew. See Atkinson, 210; Frostic, "Air Campaign Against the Iraqi Army," 15-16; Guilmartin, <u>GWAPS: Weapons, Tactics, and Training</u>, 118; Hallion, <u>Storm</u>, 221; Watts, <u>GWAPS: Operations</u>, 187.

their Harriers in reserve for the war's first three weeks in anticipation of CAS requests; and some occasionally came during this time), 47-48 (stresses the wide diversity of A-10 assigned targets), 52-57 (F-16 and F-111 performance); Guilmartin, GWAPS: Weapons, Tactics, and Training, 44 (F-111 laser guided bomb load), 60 (Harrier losses), 49 (F-16 noncombat losses); Hallion, Storm, 211-213, 287-288; Hallion, Strike from the Sky, 268; "Pentagon Gave Short Shrift to Improving Older Aircraft to Save Pilot Lives," 45; Tretler and Kuehl, GWAPS: Chronology, 221 (F-16 engine problems); Tretler and Kuehl, GWAPS: A Statistical Compendium, 646-647 (F-16 noncombat losses); and Watts, GWAPS: Operations, 155, (F-16 Maverick problems), 170-177 (the F-16 raid on Baghdad; apparently the F-16s' support elements of Wild Weasels and other jets did not meet their commitments, leaving the F-16s to fend for themselves), 205 (quotes Horner's enthusiasm after watching F-111 tank plinking video; Horner said that the A-10 Fighter Weapons School should show it in order to demonstrate "how to do the job right"), 261 (F-16 no Maverick usage), 277 (F-111 tank plinking issues); and the following interviews by author: Houle and O'Bryon (both make observations about F-16 gun pod results--Houle as an F-16 squadron commander in Desert Storm, and O'Bryon as Deputy Director of OSD's OT&E Live Fire Testing).

units' ability to conduct interdiction raids. But was this not the nature of AirLand Battle? The doctrine's advocates and the Air Force leaders who used it to force the A-10's retirement spoke of a wild battle in which only the most aggressive and technologically advanced would win. Where on the first day of this war was the headlong, hell-for-leather assault into the enemy's vitals? There was indeed an assault, and the most aggressive and most technologically adept side won. But the war's progress resembled more the traditional American emphasis upon firepower-sending the bullet before sending the man. Indeed, according to General Glosson, the Army commanders wanted A-10s held in reserve at the start of the war-when the Army had its full complement of firepower available--in order to help thwart any Iragi retaliatory advance! Nearly six weeks of intensive aerial bombardment preceded the ground advance, and according to one source, the Army reigned in its Apaches due to fear of, and lack of intelligence on, air defenses. Though the ensuing ground assault featured a brilliant turning thrust toward the enemy's rear, later accounts either described or expressed irritation at a continued caution which allowed the enemy's best forces to escape. The Army's conduct of the war sparked a debate about whether that service followed its doctrine, and Hallion rightfully observed that it followed AirLand Battle in some respects, but diverged from it in others. One can conclude that the deviations in favor of caution and heavy firepower preparation were justified, as they often have been in American wars, by the leaders' genuine concern for their citizen-soldiers.<sup>63</sup>

<sup>&</sup>lt;sup>63</sup>Bradin, <u>Hot Air to Hellfire</u>, 173-232; Frank Conahan, <u>Apache Was Considered</u> <u>Effective in Combat but Reliability Problems Exist</u>, GAO/NSIAD-92-146 (Washington, D.C.: GAO, 1992), 2-11; Frostic, 'Air Campaign," 49; Glenn Goodman, Jr., "Army Aviation Community Ponders Its Future," <u>AFJI</u> 129 (October 1991): 16 (commenting on purchasing lower cost OH-58 helicopters for reconnaissance work, Commanding General of the Army's Aviation Center, MGEN Dave Robinson, said the Army did this because "We simply don't want to risk the Apache in high risk reconnaissance operations"); Hallion, <u>Storm</u>, 77-79, 243, 252; Keaney and Cohen, <u>GWAPS Summary Report</u>, 112; Nelson, "The Combat Use of Apache Helicopters in the Kuwaiti Theater of Operations," 48-65; Smallwood, <u>Warthog</u>, 68 (Glosson observation).

The GAO report states that the Army held the Apaches in reserve due to air defense concerns. As such, Apaches only flew isolated forays into enemy territory during the air campaign. Army officer Nelson boasts that the Apache's 30 mm chain gun damaged one T-72 with a rear aspect shot at its engine. (The chain gun had a slower

The official Army history of the war, Brigadier General Robert Scales' <u>Certain</u> <u>Victory</u>, further revealed this thinking as it manifested itself in Army frustration over occasional lack of desired air support. In his short discussion of the Air Force's support operations, he cited some ground commanders' complaints that the air leaders did not assign enough airplanes to air support before the ground advance. He also wrote that air task system rigidity, fratricide incidents, and bad weather made ground commanders reluctant to use CAS. Therefore, they relied more on Army attack helicopters, whose "substantial organic firepower" [italics are this author's] lessened CAS dependence even more. Further proving that the Air Force was not the only service capable of plugging its own weapons, Scales also praised the Army's use of long-range artillery missiles (he also

For works discussing how well the war matched AirLand Battle Doctrine, see Atkinson, <u>Crusade</u>, 448-483; Gordon and Trainor, <u>Generals' War</u>, 375-432; Hackworth, <u>Hazardous Duty</u>, 58-60; LTCOL Edward Mann, USAF, "Beyond AirLand Battle: Concepts for the Future," <u>Air Force Times</u>, 16 December 1991, 31; LTCOL Edward Mann, "Operation Desert Storm? It Wasn't AirLand Battle," <u>Air Force Times</u>, 30 September 1991, 27, 61; and LTCOL Harold Winton, USA (ret.), "Persian Gulf War: Campaign without Doctrine," <u>Air Force Times</u>, 18 November 1991, 23.

The Mann and Winton pieces are a debate between the two over the war's doctrinal implications. On page 448 of his work, Atkinson writes that the maelstrom of coalition firepower was proof of AirLand Battle's primacy. However, the above-cited pages in his book--as well as much of the rest of his work--are about how Schwarzkopf's forces perhaps advanced too cautiously. Of especial interest to him, as well as to Gordon and Trainor, is how VII Corps commander, GEN Bernard Franks' cautious advance into Kuwait failed to trap the Republican Guards divisions. Hackworth's assessment was much more pungent. Writing of Schwarzkopf's response to Khafji as well as the later ground war, he observed: "As the war and staff colleges and Pentagon had worked it out, our air and ground forces were supposed to work together in a highly flexible way. When a threat or opportunity arose, they were supposed to ... reverse field on a dime to attack in another direction. What Desert Storm proved to me was that in spite of the doctrine, our forces were very stiff in the joints .... Where was all that Air-Land Battle jazz the Pentagon brass ... had been pumping out when the time came for a test?" (59-60).

muzzle velocity than the GAU-8A.) However, chain guns had many reliability problems during the war. Like other Gulf War observers, Nelson likes comparing his favored aircraft's anti-tank performance against the A-10. He claims that in one battle, an Apache battalion achieved a Iraqi vehicle kill tally which matched the A-10s' vehicle count for any one-week period. This author points out that BDA was a hard thing to prove in any event, and believes that the claim may or may not be true.

observed that missile units had problems coordinating their launches with other air and ground efforts). However, Scales apparently did not want Air Force readers to think that they could ditch the CAS mission. He concluded by praising the "tenacity and skill" of fixed-wing CAS pilots.<sup>64</sup>

Scales mentioned only the A-10 when discussing fixed-wing air support, describing it as a "devastating" weapon. The Air Force's own <u>Gulf War Air Power Survey</u> obviously had to focus upon all of the planes involved, but praised the A-10's surprising versatility and excellent work during the ground war. Since the survey had pledged itself to fairness in all its conclusions, it also offered nuanced explanations of Horner and Glosson's decisions to send the A-10s against the Republican Guards and to later withdraw them from same. However, it also focused upon the A-10's combat losses more than those suffered by the Harrier and AC-130.<sup>65</sup>

The RAND Corporation's studies of the Desert Storm air war were also generally fair to the A-10. Fred Frostic's "Air Campaign Against the Iraqi Army in the Kuwaiti Theater of Operations" described the A-10 as a workhorse in the effort against the Iraqi army. Concerning A-10 losses, he restricted himself to stating that the Hog's survivability features helped it in combat, that slower planes flying at low altitudes experienced more problems, and that small sample size required careful handling of any Desert Storm loss analysis. Concerning the latter point, Frostic presented an interesting discussion of fratricide issues. Pointing out that statistics could be misleading, he used the statistic showing that A-10 units were involved in more fratricide incidents as an example. However, the Hogs worked more frequently with friendly troops than other planes. In

<sup>&</sup>lt;sup>64</sup>BGEN Robert Scales, USA, <u>Certain Victory: United States Army in the Gulf</u> <u>War</u> (Washington, D.C.: Office of the U.S. Army Chief of Staff, 1993), 368-370 (quotes, 369-370). Scales cautions the reader to remember that though the air campaign well prepared the Iraqi army for defeat, the Army had to deliver the coup de grace.

<sup>&</sup>lt;sup>65</sup><u>GWAPS</u> has already been cited frequently in this work. However, the following are examples of <u>GWAPS</u> treatment of the A-10 and other related issues: Guilmartin, <u>Weapons, Tactics, and Training</u>, 52-55; Watts, <u>Operations</u>, 260-261 (notes altitude restriction effect upon *all* munitions), 277-281 (discussion of Republican Guards missions and losses), 305-306. Scales quote is from <u>Certain Victory</u>, 369.

spite of his own judicious handling of combat loss statistics, Frostic still completely failed to discuss both the Harrier's and AC-130's problems. Further, he dismissed any claims for the GAU-8A against tanks, saying that the altitude restrictions made it both inaccurate and ineffective. James Winnefield, Preston Niblack, and Dana Johnson's "A League of Airmen: U.S. Air Power in the Gulf War" took up the gun issue when it addressed the A-10 as part of its section on the various combatant planes. Describing the A-10 as a plane maligned by its own service both before *and* after the war, its authors mentioned that Air Force officers told them the gun was overrated. The authors added, "Some Air Force planners have . . . [said] that A-10s were either not needed in the Gulf War or were moved into the theater too soon." They also noted that, though the Hog did well, the DoD report seemed to present the Air Force's viewpoint in concentrating criticism upon this plane. They concluded that this negative assessment had its source "more in Air Force and hardware acquisition preferences" than in how well the Hog supported Schwarzkopf's campaign against the Iraqis.<sup>66</sup>

However, even these generally fair assessments of the A-10 saved their most enthusiastic praise for the sophisticated weaponry used against the Iraqi army. Certainly, American airpower technology delivered a tour de force during the war, but all of these studies' setup revealed their fear of anything detracting from smart weapons, high performance fighters, and the budget dollars they required. The 1997 GAO report, <u>Operation Desert Storm: Evaluation of the Air Campaign</u>, aimed to debunk the technological enthusiasm which accompanied some of the earlier reports, and in so doing, gave the Hog some sympathetic treatment. The report spent most of the time attacking

<sup>&</sup>lt;sup>66</sup>Frostic, "Air Campaign," 24-60; and James Winnefield, Preston Niblack, and Dana Johnson, "A League of Airmen: U.S. Air Power in the Gulf War," RAND Report #MR-343-AF (Santa Monica, Calif.: RAND, 1994), 250-251 (all quotes, 251).

Frostic also discussed the BDA flail. Interestingly, Winnefield and company also failed to discuss the Harrier's survivability problems. Further, Winnefield and the others incredibly claimed that Hallion provided "one of the more balanced assessments we have seen of A-10 shortcomings and successes during the Gulf War" (251). They did much better than Hallion by discussing the varied views of technology and air power's role in the war (259-285).

some of the more hyperbolic statements on behalf of the F-117 Stealth fighter; and though it occasionally overstated its case as much as its counterpart studies, it exposed some of the context behind the statistics. It pointed out that many of the sophisticated targeting systems on the fast jets required good weather to operate, giving the lie to claims that the A-10 was one of the few planes lacking an all-weather attack capability. Further, the report remarked upon the unfairness of counting only one-third of the A-10's "pilot-only" claims (claims made without verifying videotape) while counting higher percentages for other jets because of their sophisticated targeting gear. When discussing aircraft losses, the GAO report alone among all the others noted the problematic A-10 paint scheme which the command failed to resolve before the war. Indeed, the report observed that changing combat environments and differing aircraft capabilities made sweeping conclusions about aircraft effectiveness unreliable. Thus, most importantly, it cited the variety of airplane types as a factor in the air campaign's success.<sup>67</sup>

<sup>&</sup>lt;sup>67</sup>Henry Hinton, Assistant Comptroller General, <u>Operation Desert Storm</u>; <u>Evaluation of the Air Campaign</u>, GAO/NSIAD-97-134 (Washington, D.C.: GPO, 1997), 19, 26, 28 (loss analysis), 37 (aircraft mix factor), 79 (smart weapon limits), 106 (A-10 paint issue), 128-129 (quote), 144-145 (weapons effectiveness claim analysis); and Wheeler, interview by author.

The report compared claims by contractors and the Air Force to actual results. It was on shaky ground attacking the F-117's night performance when it mixed comparing sortie rates and mission type to those of other planes (100-102).

Winslow Wheeler contributed to writing the GAO report. He said that the A-10 data supplied to GAO was confused and incomplete, though he was uncertain as to the reason. The GAO investigators talked to approximately one hundred A-10 pilots, however, and they found that the Hog drivers had to press even their Maverick attacks before locking on to the target. He claimed that the A-10 faced defenses as intense as those seen at Baghdad, but this author believes that this is a stretch. The same type of weapons existed in Kuwait as in Baghdad, but except for the AAA, Iraqi radar SAM operators in Kuwait were often too cowed to fire their missiles. This was not the case over Baghdad.

A good example of sophisticated aircraft praise comes with the F-15E strike fighter. This plane possessed excellent targeting, performance, and weapons payload capability, but it only flew some BAI missions and no CAS. Yet Frostic heavily praises it and the F-111s' high-tech anti-armor missions, and Winnefield and company report that some Air Force pilots wanted to retire *both* A-10s and F-16s in favor of F-15Es. See Frostic, "Air Campaign," 55-60; and Winnefield, Niblack, and Johnson, "League," 250.

If there was one technology which rated special treatment because of its promise, it was the Marines' Harrier V/STOL attack jet. Only John Guilmartin in the <u>Gulf War Air</u> <u>Power Survey</u>'s weapons description mentioned its survivability difficulties. If some studies criticized the Hog's lack of sophisticated weaponry, they glossed over the Harrier's lack of same. Ironically, the Marines' Battlefield Assessment Team members were harder on the Harrier's performance in their study of armored warfare in their sector of Kuwait. At the same time, they rendered the A-10 perhaps its greatest praise. They pointed out Harrier weaknesses that the Air Force and others had described to congressmen for decades: lack of loiter capability and ruggedness. To them, the Hog ranked second to the attack helicopter as the number one tank killer. It also represented the ideal for CAS work; and they concluded by mentioning that Marine Desert Storm FACs, "acknowledging some degree of heresy for their comment, stated that the A-10 was worth as many as 10 sections [two-plane formations] of AV8Bs."<sup>68</sup>

## A Survivor and a Victor

The A-10 Warthog passed flyoff tests against the A-9 and A-7, a quasi-flyoff test against Army attack helicopters in TASVAL, and an effort by its own service to retire it. The late 1980s found it facing yet another major flyoff against several planes and weapons. That test was preempted by a real-life test called Desert Storm—a trial in which the Hog gave its best performance. There was no reason why it should not have. Its creators not only designed it from the ground up to fly air support, but also incorporated every lesson learned from other planes flying air support.

The Hog's own service mostly rejected its victory. As the RAND study observed, this stemmed from concerns that Congress and others might divert money from its favorite weapons to the Hog in the post-Cold War military budget drawdown. However, the service's frustration over the Warthog's resiliency also drove its contempt. It believed that it had found in the F-16 a plane which satisfied its search since World War II for a multirole

<sup>68&</sup>quot;Armor/Anti-Armor," 34.

fighter. The F-16 *could* fly CAS and do other missions as well, but it could not fly air support better than the purpose-built A-10.

The service cited Army doctrine and budgetary constraints to claim that only one type of war was possible and that multipurpose fighters like the F-16 could best fight it. The budgetary issue was particularly compelling, for post-Cold War drawdown exigencies forced the retirement of other Air Force planes, such as the F-4G "Wild Weasel" defense suppression fighter.<sup>69</sup> However, the Hog remained because people in OSD and Congress were still interested in the air support mission. And though even some of this group gave up on the Hog in favor of some other type of CAS plane, their efforts delayed Air Force action until the vagaries of the budget, politics, and war itself guaranteed that the greatest dedicated CAS plane ever built would live on.

<sup>&</sup>lt;sup>69</sup>Edward Kolcum, "USAF to Retire A-7s and F-4s, Boost F/A-16 Role in the Tactical Fighter Fleet," <u>AW&ST</u> 134 (25 February 1991): 54-55. Also, the article cites TAC acquisitions chief, MGEN Joseph Ralston, as saying that though the Air Force accepts the A-10 as the F-16's air support counterpart, it would give this mission entirely to the F-16 if "dollars were no object" (54). The reason was familiar: the F-16 possessed the speed and agility to avoid ground fire.

## CHAPTER X CONCLUSION

The Hog and its pilots capped 1991 by winning the Air Force's biennial autumn air-to-ground gunnery meet, called "Gunsmoke," for the first time. The winning A-10 unit, the Air National Guard's 175th Tactical Fighter Group from Baltimore, Maryland, used the brand new LASTE fire control avionics modification to beat F-16, F-15E, F-111, and A-7 Air Force and Air National Guard outfits. The individual Gunsmoke champion was a Hog Driver, Lieutenant Colonel Roger Disrud of the Air Force Reserve's 442nd TFW at Richards-Gebaur Air Force Base, Missouri (also LASTE-equipped). Unavailable to Desert Storm units several months before, LASTE's debut enabled victory in an event routinely dominated by F-16s. <u>Air Force Magazine</u> reminded its readers of the Hog drivers' advantage in using their plane's slower speed to give themselves a steadier aim and to get closer to the target. Of course, in CAS, that was the intent.<sup>1</sup>

One might wonder why the Hogs had not always been more competitive if they could fly closer to the target than the faster jets. Gunsmoke was a sport competition which, until after the Hogs' victory in the 1991 contest, did not emphasize tactical considerations as much as maximizing bomb scores. The faster jets could not get closer to the target than the A-10s, but they got close enough to allow their more sophisticated fire control systems to overcome the more primitive A-10s' speed and firing distance advantage. That is, until the Hogs received their own advanced fire control equipment.

<sup>&</sup>lt;sup>1</sup>Frank Oliveri, "The Warthog Round at Gunsmoke," <u>AFM</u> 75 (March 1992): 32-37; LTCOL Ron Henry, ANG, "LASTE Employment in Olympic Bombing," <u>FWR</u> (Spring 1992): 20-22; and LTCOL Henry, interview by author.

F-15E pilots complained that the competition did not address their more sophisticated weapons delivery systems, and <u>AFM</u> informed readers that the next Gunsmoke would emphasize the greater delivery ranges and smart weapons. LTCOL Henry was on the winning team.

*Then* the plane's performance advantages emerged--the advantages incorporated to enable it to support engaged troops better than any fighter.<sup>2</sup>

At least after Desert Storm, the remaining Hog units started to receive some of the technological largesse that the Air Force had bestowed upon the F-16 during the CAS dispute years. Though they did not get FLIR devices, Hog Drivers started using night vision goggles (NVGs). And per the 1990 DAB's wishes, A-10s slowly began receiving GPS and targeting data link equipment. Studies focused upon giving the plane new engines for more thrust, reducing heat sources to help defeat heat-seeking missiles, covering surfaces with radar absorbent material, and in a tacit admission that its paint scheme might have been a factor in the Desert Storm losses, re-painting the Hog some color other than dark green. The shrinking budget made uncertain when or even whether some of these modifications would occur, but the plane's continued presence ensured that some would probably happen. As of 1993, approximately four hundred Hogs remained operational, evenly split between Air Force and Air National Guard/Air Force Reserve units. Several sources indicated that the service's long range plans included keeping Hogs until nearly 2030!<sup>3</sup>

<sup>2</sup>MAJ Steven Bell, USAF, "Close Air Support for the Future" (Master's thesis, U.S. Army Command and General Staff College, 1992), 92-93.

<sup>&</sup>lt;sup>3</sup>"A-10s Take on the Night," <u>Air Force Times</u>, 5 February 1996, 25; David Fulghum, "Night-Fighting CAS Force Gains Preliminary Approval," <u>AW&ST</u> 138 (8 February 1993): 52; David Fulghum, "Signature Reduction Key to A-10 Survival," <u>AW&ST</u> 138 (7 June 1993): 135-136; Smallwood, "Old Hog," 23-30; and the following interviews by author: Chaleff, Farmer, Fredericksen, LTCOL Henry, Kuebler, Koechle, and Swift.

Sources for the plane's projected operational life are Chaleff, Fredericksen, LTCOL Henry, Kuebler, Swift, and Fulghum, "Signature Reduction." Farmer observed that the service seemed to be backing away from technological modifications for both the A-10s and CAS-designated F-16s that the 1990 DAB directed. He added that some of this was due to budgeting and technical difficulties, however. The A-10 did receive a new light gray paint scheme to accommodate the new emphasis on higher altitude tactics. Chaleff at AATC pointed out that GPS and target data link equipment were available for modification. Chaleff said that the FLIR addition was still in the future, and that the Air National Guard might pursue the engine modification, especially if it ends up with all of the remaining A-10s.

What this also implied was that the service had no plans to build a new CAS plane. The congressional threats about a big CAS plane test and moving the A-10 to the Army remained just that. With all the continued budget cuts and the Air Force's total number of fighter wings projected at less than twenty, such actions as a six-year test apparently seemed too extravagant to accomplish. Also, the Air Force at least kept A-10s while it retired other jets such as the A-7 and F-4. The 1990s witnessed no serious congressional talk of either of the threatened actions. (Besides, at least one Air Force Chief of Staff scared people by embracing the CAS mission transfer idea.)<sup>4</sup>

Instead, the Air Force embarked with the U.S. Navy and Marines, as well as Britain's Navy and Air Force, upon a joint search for a fast attack plane for the early twenty-first century. Appropriately called the Joint Strike Fighter, it was supposed to blend commonality among the various services while still offering enough variations for specific needs. In other words, the services hoped it would not turn out like Robert McNamara's dream of a multiservice, multirole fighter--the controversial F-111 which finally served best as an all-weather bomber. This was a hard task, however, for the U.S. Marines and Royal Navy wanted short-takeoff-and-vertical-landing (STOVL) capability similar to that seen in the Harrier, while the U.S. Navy wanted normal carrier landing capability. The U.S. Air Force wanted it to have a gun while the U.S. Navy wanted heavier emphasis upon stealth technology. All of the services wanted the plane to equal or exceed current fighters such as the F/A-18 or F-16 in performance; and all wanted the best avionics package. The result was that by 1998, the official per-aircraft cost was twenty-eight million dollars, while Aviation Week reported estimates creeping toward \$40 million.<sup>5</sup>

<sup>&</sup>lt;sup>4</sup>Neff Hudson, "Fewer than 20 AF Fighter Wings Seen Soon," <u>Air Force Times</u>, 9 November 1992, 11; Kolcum, "USAF to Retire A-7s and F-4s," 54; and the following interviews by author: McPeak and Ringo.

<sup>&</sup>lt;sup>5</sup>David Fulghum and Robert Wall, "Joint Strike Fighter Price Creep Triggers Pentagon Review," <u>AW&ST</u> 148 (16 March 1998): 27; John Tirpak, "Scoping out the New Strike Fighter," <u>AW&ST</u> 81 (October 1998): 36-41; and William Scott, "Joint Strike Fighter Balances Combat Prowess, Affordability," <u>AW&ST</u> 149 (3 August 1998): 51-54.

One report said that the plane's guiding principles were to be "lethality, supportability, and survivability." Though two of these matched two of the A-10's four design principles, the Joint Strike Fighter was obviously not a simple plane that an air arm would want to send on rough-and-tumble CAS missions. As such, the Air Force's retention of A-10s and pursuit of a very sophisticated attack plane sent a mixed signal about its intentions toward CAS. There was a reason for the seeming ambiguity, and it lay in the technological faith of Air Force leaders.<sup>6</sup>

In a move reminiscent of the Air Force bomber generals' stance in the post-World War II military budget drawdown, post-Cold War Air Force leaders such as Chief of Staff Merrill A. McPeak asserted his service's primacy in the American arsenal. Just as the leaders of the newly created Air Force used World War II results and new technology to claim preeminence in the new way of fighting war, so McPeak and company averred that Desert Storm was proof of same. McPeak denied in one defense journal article that he did this; he only wanted the American military to fight "better and cheaper." However, as air leaders did in the late 1940s, he attacked some of the other services' functions as irrelevant in the new order. In a 1994 Roles and Missions Review, McPeak frequently cited Desert Storm and even recent operations in the former Yugoslavia to claim that the Navy did not need so many carriers and the Marines did not need advanced fighters. In these particular situations, naval air provided a fraction of the air assets in a sustained air campaign. Because there was comparatively little ground action, the Marines flew more interdiction missions, and thus overlapped into the Air Force's domain. The Navy and Marines could use smaller carriers geared to amphibious operations, and CAS-oriented aircraft such as Harriers and attack helicopters. Just as it did in Desert Storm, the Air Force would in future provide the muscle for the all-important air campaign, and should be allocated the funds for it.<sup>7</sup>

<sup>&</sup>lt;sup>6</sup>Scott, "Joint Strike Fighter Balances Combat Prowess, Affordability," 51 (quote).

<sup>&</sup>lt;sup>7</sup>GEN Merrill A. McPeak, USAF, "Presentation to the Commission on Roles and Missions of the Armed Forces," (Washington, D.C.: Office of the Chief of Staff, USAF., 14 September 1994), 88-96, Texas Tech Library Government Documents Section

In this presentation and in other pronouncements, McPeak envisioned functionally homogenous services which would supply units to a theater commander who could best determine how to meld any functional overlap, or "seam," as McPeak called it. He spoke of "deep battles," "high battles," and "close battles," with a particular service assigned primary responsibility for preparing for each. The Air Force would handle the deep and high battle concerns by attaining air superiority, accomplishing strategic bombing, and strangling the flow of men and supplies to the front. He wanted the Air Force to take long-range missile artillery and air defense missiles from the Army, and in return, he was willing to cede to the Army a close battle function-close air support. McPeak wanted what he called "seamless" warfare, because current service functional setups created seams which became unneeded or inefficient overlap activities. To him, CAS was one such seam: too many interservice arguments over coordination of firepower, too many fights over weapons procurement, and too much money and time spent trying to do the job right. The Army had the necessary close battle firepower in the form of Apaches, short-range artillery missiles, and M-1 Abrams tanks. It could handle the forces it met. If the Air Force did its deep and high battle jobs as it did them against Iraq, the Army would only have to clean up the battered remnants anyway.<sup>8</sup>

McPeak later said in an interview that the issue did not involve technology so much as how one organized one's fighting force. However, as his presentation revealed, the air leader's vision was very much technology oriented. The initial slides presenting his CAS transfer proposal praised a plane which also did some good work in Desert Storm. Known

Holding; and GEN Merrill A. McPeak, USAF, "The Roles and Missions Opportunity," <u>AFJI</u> 133 (March 1995): 32 (quote).

<sup>&</sup>lt;sup>8</sup>McPeak, "Presentation," 37-39, 121; McPeak, "Opportunity," 32-34; and McPeak, interview by author.

In his "Opportunity" article and interview with the author, McPeak used economic metaphors to describe why he did not want CAS for the Air Force. The Army got CAS service from the Air Force as a "free good" and should pull its own weight ("Opportunity," 33). He told the author that in modern warfare, CAS had a "shrinking market share" of mission tasking. As for the A-10, McPeak dismissed it as a "disappointment" and a "junior varsity airplane" whose pilots made it work.

as JSTARS, for Joint Surveillance Target Attack Radar System, it was a Boeing 707 modified to provide radar surveillance of vehicular traffic behind enemy lines, conditions permitting. It detected the Iraqi advance on Khafji and helped direct interdiction strikes against Iraqi reserves for that battle. At the end of the war, it spotted the Iraqi vehicular retreat from Kuwait City and thus spurred its mauling by attack planes. McPeak and the interdiction advocate Price Bingham foresaw future wars in which JSTARS would find the enemy reserves, superior aerial firepower would crush them, and the Army would finish off the remains. Addressing warfare in general, Bingham's article titles proclaimed, "Let the Air Force Fight Future Land Battles," and "Revolutionizing Warfare through Interdiction." Turning to JSTARS itself, Bingham gushed in one article title that "It's the Greatest Thing Since Gunpowder."<sup>9</sup>

The view that Air Force fixed-wing CAS was at least dormant was not an idea restricted to a cocksure Air Force Chief and an air power zealot. The Air Combat Command (ACC; in 1992, TAC and SAC merged into a central command for all warplanes) commander, General Mike Loh, responded to criticisms of the Air Force's CAS

<sup>&</sup>lt;sup>9</sup>Bingham, "It's the Greatest Thing Since Gunpowder," <u>Proceedings</u>, 45-49; LTCOL Price Bingham, USAF (ret.), "Let the Air Force Fight Future Battles," <u>AFJI</u> 131 (August 1993): 42; LTCOL Price Bingham, USAF (ret.), "Revolutionizing Warfare Through Interdiction," <u>Airpower Journal</u> 9 (Spring 1996): 29-35; McPeak, "Opportunity," 32-34; McPeak, "Presentation," 98-122; and McPeak, interview by author.

Other Bingham articles are "Air Interdiction and the Need for Doctrinal Change," <u>Strategic Review</u> (Fall 1992): 24-33; "Awake, Aware, and Alert," <u>AFJI</u> 134 (October 1995): 56-57 (J-STARS piece); and "Forward . . . From the Sea with Joint STARS," <u>Marine Corps Gazette</u> 80 (January 1996): 26-30. One must not forget that after retirement, Bingham was employed by Northrop-Grumman as a JSTARS spokesman.

In his Roles and Missions briefing, McPeak presented Cordesman and Wagner's <u>Lessons of Modern War</u> comments about CAS out of context. He quoted their statement about air arm CAS problems but did not add their observation that airmen seemed by nature averse to the mission. He also took CAS mission statistics for past wars out of context by showing only certain periods and certain theaters. This allowed him to present a graph showing a declining CAS trend. Desert Storm was the final conflict shown--a war featuring only one hundred hours of ground action against a disorganized and demoralized foe. Finally, in a statement laden with implications about Army attack helicopter cost and the Air Force's opinion of the CAS mission. McPeak pointed out that the Army invested more money in its attack helicopters than the Air Force did in its CAS-assigned planes.

attitude by saying that his service aimed to better use battlefield surveillance and interdiction, and thus "relieve to a great extent the army's direct contact." As such, people described future CAS as a rarely needed emergency procedure-used only when the well-orchestrated maelstrom of violence both at and behind the enemy's front line inexplicably did not work. And if that situation arose, CAS would not require special planes and procedures anyway. As former Syracuse Air National Guard commander Mike Hall bluntly stated in a 1998 Aviation Week editorial, new technology such as JSTARS, advanced avionics, data link transfer, GPS, and precision weapons made traditional CAS obsolete. Any modern fighter possessing these goodies could easily perform the mission. Those supporting attack helicopter CAS spoke up as well. In 1993, Marine Lieutenant Colonel Barry Ford and retired Army Lieutenant Colonel William Welch wrote in the Naval Institute Proceedings that CAS was too hard to do with fixed-wing planes and that attack helicopters could assume the role nicely. Aviation writer Bill Sweetman expressed the same opinion in an International Defense Review article, though his observation that Apaches had no problem with Iraqi SAMs was somewhat misleading. During the Desert Storm air campaign, the Army never extensively put Apaches in serious danger, and during the ground war, the Iraqi air defense was too disrupted to pose a serious threat.<sup>10</sup>

<sup>&</sup>lt;sup>10</sup>Loh citation is from John Boatman, "USA Redefines CAS Doctrine for a New Era of Warfare," Jane's Defense Weekly 18 (12 December 1992): 17. Mike Hall piece is from "Viewpoint, Close Air Support: Technology Fighting Tradition," <u>AW&ST</u> 149 (17 August 1998): 94. For the high-tech promise of future CAS, see also MAJ Steve Gawler, USAF, and others, "Airpower in the Close Battle: 2010," (Research paper, Air Command and Staff College, 1995), 60-67.

The CAS as emergency procedure sources are John Boatman, "ACC: Stand-Off Fights Will Mean Less CAS," <u>IDR</u> (November 1992): 1081; Boatman, "USA Redefines CAS Doctrine," 17; LTCOL Daniel Fake, USA, in "The Evolution of Close Air Support Doctrine and Implications for the 21st Century" (Research paper, Air War College, 1995), 27-29; and McPeak, "Opportunity," 33.

Sources featuring support for helicopter-only CAS are: LTCOL Barry Ford, USMC, "The Future Is Attack Helicopters," <u>Proceedings</u> 120 (September 1994): 54-55; Harrison, "Gift," 36-39; Neff Hudson, "AF Said to Slight Close Air Support, Could Lose Mission," <u>Air Force Times</u>, 9 November 1992, 11 (recounts CAS debate at recent air power seminar); Bill Sweetman, "Close Air Support: Fighters High, Helicopters Low," <u>IDR</u> (November 1992): 1077-1081; LTCOL William Welch, USA (ret.), (Is Fixed-Wing

Another reason cited for dumping the mission was the budget. Acting as if they were planning the air force structure of Ecuador or Malaysia, U.S. Air Force officers and other observers proclaimed that the budget did not allow the luxury of single-mission planes. Only multimission fighter-bombers flying more productive interdiction and air superiority missions were affordable. Whether officers and observers still supported traditional CAS or not, some officers and observers pointed out that with the Army fielding more potent helicopters and long range, precision-guided missile artillery, interservice arguments over what constituted supporting firepower threatened to make the CAS argument irrelevant or too hard to resolve. Others asserted that air defense weapons such as the Stinger rendered CAS impractical. In this they all further fueled McPeak's argument for functional redistribution within the American armed forces.<sup>11</sup>

<sup>11</sup>Most of those sources citing fiscal restraints on CAS development are the same ones who believe that helicopters are a better means to accomplish the mission: Bryan, "Close Air Support Doctrine: Dynamic Future or Dogmatic Past," 19-22; Ford, "The Future Is Attack Helicopters," 54-55; Harrison, "Gift," 36-39; Hudson,"AF Said to Slight Close Air Support, Could Lose Mission," 11; GEN Glenn Otis, USA (ret.), "Shuffling Assets Isn't the Answer," <u>AFJI</u> 133 (May 1995): 36-37 (rebuts McPeak's force restructuring plan, but believes that single-mission CAS planes like the A-10 are a waste of money); Sweetman, "Close Air Support: Fighters High, Helicopters Low," 1077-1081; Welch, "Is Fixed-Wing CAS Worth It?" 52-55; Welsh, "Just Give Me the FACs! The Case on CAS," 5-12 (features flawed sources and asserted conclusions).

Sources discussing fire support boundary problems/solutions are Bryan, "Dynamic Future or Dogmatic Past?" 1-3, 12-19; Monte Callero and Clairice Veit, "Close Air Support Evaluation: Preliminary Insights for ASCIET (All Services Combat Identification Evaluation Team)," RAND Report #PM-464-JS (Santa Monica, Calif.: RAND, 1995), 7 (this government-sanctioned, on-going study of fratricide problems and solutions says CAS request and approval procedures "makes one's eyes cross and . . . one's teeth hurt"); Fredericksen, "Close Air Support," in <u>Selected Papers</u>, 112; LTCOL Bryan Jones, USAF, "Close Air Support: A Doctrinal Disconnect," <u>Airpower Journal</u> 6 (Winter 1992): 60-71; McPeak, "Opportunity," 32-34; MAJ Carlton Meyer, USMCR, "For Guys on the Ground," <u>AFJI</u> 133 (June 1995): 58-59; CAPT Douglas Schaare, USA, and CAPT William McAllister, USA, "CAS in the Deep Fight," <u>Infantry</u> 83 (September-October

CAS Worth It?" <u>Proceedings</u> 120 (September 1994): 52-55; LTCOL Mark Welsh, (service unknown), "Just Give Me the FACs! The Case on CAS," (Research paper, National War College, 1993), 5-12 (features flawed sources and asserted conclusions).

And yet some people did not care for McPeak and others' confident assertions about future war. Even General Welch said that he and his Army associates still saw a need for the mission. All of the Army senior leaders interviewed for this work also wanted the Air Force to honor CAS commitments. An Air Force general who served on ACC staff recalled that the Army liked the fact that the A-10 remained operational, because it served as the continuing bona fide of the Air Force's commitment to support. And in the same military journals that the airpower visionaries pressed their case, other observers questioned the utopian vision of Air Force technology solving all future conflicts as neatly as in Desert Storm. They saw the Air Force once again using a convenient technologically deterministic excuse to abandon the mission; and they wondered if the service would be too busy with its preferred missions to answer desperate calls for CAS when things went wrong. They also saw the mission still requiring specialized planes and proficient pilots.<sup>12</sup>

As one can see, the CAS debate continued somewhat, fanned by defense drawdown questions and periodic roles and missions reviews. And like the late-1980s debate, actual combat supported the case for the mission and its dedicated planes.

<sup>1983): 14-16;</sup> and Sweetman, "Fighters High, Helicopters Low," 1078.

<sup>&</sup>lt;sup>12</sup>Sergio Coniglio, "Close Air Support Operations and Debate," Military Technology (October 1993): 30-36; LCDR Matthew Faletti, USN "Close Air Support Must Be Joint," Proceedings 120 (September 1994): 56-57; CAPT Scott Fedorchak, USA, "Close Air Support: Repeating the Past, Again ... ?" Airpower Journal 8 (Spring 1994): 22-33; Scott Hedberg, "Role of A-10 in Army," Army (November 1991): 6 (rebuts Harrison's assertion that the Army neither needs nor can afford A-10); Lawrence Maduras, "Correspondence: CAS Is Best Use for A-10," AW&ST 149 (26 October 1998): 6 (rebuttal letter to Hall's editorial; wants A-10s in the Army if the Air Force does not want them); Meyer, "For Guys on the Ground," 58-59 (rebuts Air Force and Navy leader assertions that CAS is too expensive for the effort); MAJ Brooks "Kato" Wright, USAF, "Urban Close Air Support: The Dilemma," USAF Weapons Review (formerly, the Fighter Weapons Review) (Summer 1998): 15-19 (points out A-10 potential for future urban conflict); and the following interviews by author: Croker (the ACC staff general), Richardson, Russ, Saint, Vuono, Welch, and Wickham. (That is, three former Army Chiefs of Staff, one former Air Force Chief of Staff, one former TAC commander, and two other Air Force/Army senior leaders thought CAS worthwhile-even if there were differing ideas of what it looked like.)

A-10s, or AC-130s, or even Apaches might have reversed the American debacle at Mogadishu, Somalia, in autumn 1993. One of the problems in this disastrous urban fire fight against a relatively primitive enemy was the lack of heavy firepower. Here was a conflict where JSTARS, interdiction, and the Army's heavy weapons were not factors. If the American leadership worried about sending too large a ground force as it did in Somalia, then A-10s or AC-130s would have to be the firepower choice. And A-10s were the choice for monitoring potential ground war flash points around the world during the 1990s. A-10 pilots reported that their units deployed to patrol operations over Bosnia, Iraq's no-fly zone, and the inter-Korean border so frequently that many of their colleagues left the service for the airlines. And indeed, with their loiter time, ordnance carriage ability, and skill at working with ground units, Hogs got heavy usage in war-torn Bosnia. Using NVGs, they flew night SAR missions for downed pilots--which, by the way, involved the loss of other planes, not A-10s. And in 1995, they figured prominently in attacks against Bosnian-Serb Army positions. It was not CAS, for there were no troops in contact; but it did involve pinpoint targets in the chaotic patchwork of various factions' positions. With LASTE, the A-10's accuracy with both bombs and gun was excellent. (The GAU-8A set trucks on fire at two-and-one-half miles range!) It further demonstrated that there were situations where the Army could not bring in its attack helicopters and heavy firepower, and also where the enemy was too dispersed in mountainous terrain for JSTARS and interdiction to work. However, these situations featured enough of an air defense to require more maneuverable planes. The Bosnian Serbs fired heat-seeking missiles which the Hog Drivers defeated with maneuvers and flares. In such warfighting situations, aircraft such as the A-10 were a valuable resource.<sup>13</sup>

<sup>&</sup>lt;sup>13</sup>"A-10s Take on the Night," <u>Air Force Times</u>, 25; "A Plan for Action," <u>Jane's</u> <u>Defense Weekly</u> 20 (23 October 1993): 32 (reports FAC activities in Bosnia, to include OA-10 operations--this challenges the ASCIET's claim that airborne FACs were obsolete in modern combat operations); David Hackworth, "Air Power Just Won't Work," <u>Newsweek</u>, 17 May 1993, 32; Hackworth, <u>Hazardous Duty</u>, 173-183, 257-259, 277-283; Bryant Jordan and Andrew Compart, "Global Mission': Revolving Door Keeps Turning for Numerous Units," <u>Air Force Times</u>, 1 April 1996, 22; Dr. Dean Simmons, and others, "Air Operations Over Bosnia," <u>Proceedings</u> 123 (May 1997): 58-63; Jonathan

Though Americans hailed the Cold War's end as a time of peace, military conflict and vigils proliferated. *None* of these fit the "battlefield of the 1990s" high-tech vision of war which helped fuel both the 1980s and 1990s CAS debates. Indeed, a participant in a 1990s study of how to eliminate fratricide incidents observed in an interview that new communications and targeting gear such as ATHS faced even more problems with operational reliability and interservice compatibility than traditional equipment such as radios. The A-10 continued to prove its worth in the face of a chorus of voices proclaiming, as they had since the end of World War II, the death of CAS and CAS planes. In a 1994 <u>Airpower Journal</u> article, Army Captain Scott Fedorchak described the Air Force's unceasing effort to move on to future war and leave air support behind--and

The Fighter Mafia's newer allies tried to get the Navy and Marines to re-commit themselves to air support via a movement called "Jaeger Air." The justification was that if the Navy wanted to embark upon a new doctrine emphasizing power projection ashore, air support would be a central mission. See Jaeger Group X-Ray [pseud.], "Jaeger Squadron (X)," <u>Marine Corps Gazette</u> (May 1996): 63-65; and COL Michael Wyly, USMC (ret.), and CDR Daniel Moore, USN, "Hunters from the Sea," <u>Proceedings</u> (December 1995): 31-33; MAJ T.C. Moore, USMC, "We Don't Need Jaeger Air," <u>Proceedings</u> 122 (September 1996): 32-36 (ironically, opposition based upon an Air Force-like belief in interdiction); and MAJ Lawrence Roberts, USMC, "Flying in Hunter-Warrior," <u>Proceedings</u> 123 (September 1997): 46-50.

Stevenson Losing Mogadishu (Annapolis, Md.: Naval Institute Press, 1995), 80-97, 100-105, 128-129 (notes American penchant for firepower solutions); and the following interviews with author: Condon, Koechle, Swift, and Wykstrom.

Swift commanded the Air National Guard unit which flew the Bosnian attack missions and Wykstrom flew some of those missions. Swift recalled that the scenario suited A-10s well--better than the F-16s which also flew. There was a high minimum altitude during the air campaign, but the LASTE-equipped A-10s were so accurate that they were the only non-laser guided bomb equipped planes allowed to expend ordnance (though they also used Mavericks on some targets). Wykstrom said that on certain days, the weather was such that only the maneuverable A-10s could strike the targets. Hackworth's article challenged the Air Force's post-Desert Storm claims and said that airpower alone could not end the Bosnia War. However, he strongly praised the A-10. A double irony is that Hackworth was wrong; the 1995 air strikes were a key factor in ending the Bosnia war, but they did not feature the ultra high-tech air campaign predicted my McPeak--instead they featured tactical jets like the A-10 flying air support missions. Hackworth's book points out the lack of firepower at Mogadishu, and also discusses the results of the Bosnia air strikes. He thus admits their success in this case, and he again praises A-10s.

how real conflicts repeatedly brought it to heel. New military commitments featured conditions and restrictions which limited how America used its power, and thus, as in Vietnam and Korea, its airmen had to use traditional CAS as a firepower solution. But he concluded that though the Air Force still possessed A-10s and practiced the mission, it once again slowly backed away from it in favor of the high-tech future war vision. Reporter Anatol Lieven pointed out the limits of this vision when commenting upon Russia's war in Chechnya. High-tech interdiction was irrelevant to the Russian soldiers fighting in Chechnya's towns, and Lieven wondered at the American military's belief that hard ground fighting no longer existed:

A senior US official told me recently that if I went around saying this kind of thing in Washington, I'd be ridden out of town on a rail. He meant it as a joke--I hope!--but there was an element of truth in his words. A belief in the all-powerful nature of high-tech weapons and long-range bombardments is wonderfully appealing to contemporary Americans. It both flatters their ... pride in American technology and suggests the possibility of repeated victories without the risk of serious casualties. However, the US will not always have the ability to pick and choose its wars, and the key lesson of Chechnya is that there will always be military actions in which a determined infantryman will remain the greatest asset.

Lieven could have added that in the American scheme of things, the infantryman will always want firepower, and there was an irony in this for the American way of war and CAS. The same desire to use technology instead of lives drove the American preference for CAS firepower. However, it also powered its Air Force's desire to neglect the mission in favor of other, seemingly easier, technological solutions. Hard ground combat problems then brought that service back to delivering firepower support for the American soldier. As Captain Fedorchak wondered, would this circle be unbroken?<sup>14</sup>

<sup>&</sup>lt;sup>14</sup>Anonymous interviewee "E" (fratricide study source, participated in ASCIET); LT David Adams, USN, "We Are Not Invincible," <u>Proceedings</u> 123 (May 1997): 35-39; Jeffery Barnett, <u>Future War: An Assessment of Aerospace Campaigns</u> (MAFB: Air University Press, 1996), xvii-xxvi, 87-90 (good example of continued future war assertions; focuses upon high technology, and in 150 total pages does not mention CAS once); Michael Elliott, "The Neurotic Lion," <u>Newsweek</u>, 26 September 1994, 36; Fedorchak, "Repeating the Past... Again?" 29-32; Jordan and Compart, "Global Mission," 22; Charles Krauthammer, "How the Doves Became Hawks," <u>Time</u>, 17 May

## The Complexity of Military Technology

The author wishes that this airpower technological enthusiasm circle would be broken concerning CAS, but he understands that it is a tall order not only for the Air Force but also for America in general. Some technology history works describe a loss of faith in technology among Americans in the latter twentieth century. However, this author thinks otherwise. There may be a maturing of attitudes, but Americans can still wax quite enthusiastic about new machines. Indeed, one need only ponder the unquestioning enthusiasm of many within the public, business, and academia for computer technology such as the internet. Enthusiasm features not only the sometimes naive beliefs in a new technology's benefits, but also the equally simplistic condemnations when it fails. The praise and censure also applies to those involved with the specific technology, and this is especially the case with military technology. For example, military leaders are said to be too stupid to see the obvious impact of such devices as the bomber; or they are too narrow mindedly wedded to outmoded weapons like the bomber.<sup>15</sup>

<sup>1993, 74;</sup> Anatol Lieven, "The World Turned Upside Down: Military Lessons of the Chechen War," <u>AFJI</u> 136 (August 1998): 40-43 (quote, 43); Walter Mears, "Now It's the Democrats Turn to Be Hawks," <u>Alamogordo Daily News</u>, 15 July 1994, 4A; and Tom Morganthau, and others, "Globo-Cop," <u>Newsweek</u>, 23 August 1993, 14-19; George Will, "History Revs Its Engine," <u>Newsweek</u>, 18 September 1995, 90.

A side-note about technology and CAS is the current fate of what are called UCAVs (Uninhabited Combat Aerial Vehicles). Though there is some recent talk about UCAVs' coming replacement of fighter and attack pilots, development of even primitive reconnaissance models has been expensive and problematic. Even some of the most technologically enthusiastic Air Force leaders are squeamish about giving a machine authority to use weapons. See Michael Dornheim, "Many Changes Made to DarkStar," <u>AW&ST</u> 149 (6 July 1998): 26; David Fulghum, "DarkStar Beats Problems, Scores Successful Flight," <u>AW&ST</u> 149 (6 July 1998): 25; Jason Sherman, "Outrider's Swansong?" <u>AFJI</u> 136 (November 1998): 14-17; "What About UCAVs ?" <u>AFM</u> 81 (October 1998): 40; and the following 3 August 1998 <u>AW&ST</u> articles by David Fulghum: "Aircraft, UCAVs : An Uneasy Mix," 68-70; "Decades Are Needed to Perfect Unmanned War Planes," 70-71; "Next Generation UCAVs Will Feature New Weapons, Engines," 71-72.

<sup>&</sup>lt;sup>15</sup>Examples of academic works professing some degree of, if not complete, disillusionment with technology are Corn, <u>The Winged Gospel</u> (claims that World War II ended America's romance with flying); Gary Cross and Richard Szostak, <u>Technology and</u>
This work certainly does not agree with many Air Force leaders' actions, but in several hundred pages he showed that in some ways their attitudes concerning technology were due more to a complex interaction of outside influences, as well as their perception of those influences. One need not review the labyrinthine acquisition procedures, the multiple

<u>American Society: A History</u> (Englewood Cliffs, N.J.: Prentice Hall, 1995), 309 (balanced assessment describes technology's impact as ambiguous); Alan Marcus and Howard Segal, <u>Technology in America: A Brief History</u> (Fort Worth, Tex.: Harcourt Brace Jovanovich College Publishers, 1989), 352 (cites "America's fading faith in technological progress"); and Carroll Pursell, <u>The Machine in America: A Social History</u> <u>of Technology</u> (Baltimore, Md.: The Johns Hopkins University Press, 1995), 301-319 (describes modern technology as "unpalatable, dangerous, and often ineffective" [310]).

Interestingly, three of the above book examples are textbooks for technology history courses. This author presents as rebuttal the NBC Nightly News which, at least through the mid 1990s, routinely featured a segment that was little more than an "infomercial" for the internet. Also, there are many articles in the 1998 editions of The Chronicle of Higher Education which discuss academia's embrace of computer and internet technology. Some examples are: "Letters: The Jury Is Still Out on the Wisdom of Requiring Web Pages for Courses," 19 June 1998, B3; Kelly McCollum, "A Computer Requirement for Students Changes Professors' Duties as Well," 26 June 1998, A22; Ed Neal, "Using Technology in Teaching: We Need to Exercise Healthy Skepticism," 19 June 1998, B4; Kate Wittenberg, "Cutting Edge Scholarship and Electronic Publishing," 19 June 1998, B6. The McCollum article covers both the University of Florida's requirement for students to have computers and the accompanying push for professors to use computer technology in their courses. In his essay, Ed Neal writes that college administrators' push for electronic technology in college courses may endanger proven teaching methods--the professors should determine whether and how computers and the like will be used. After the UCLA administration encouraged all of its faculty members to incorporate the internet into their courses, the above "Letters" section featured reader concerns that were similar to Neal's.

Two examples of claims for, or against, bombers and airpower are Copp, <u>A Few</u> <u>Great Captains</u>, 399-417, 445-450 (among other passages in the book, these praise the pre-World War II air leaders for having the vision to develop airplanes such as bombers); and H.D. Levine, "Some Things to All Men: The Politics of Cruise Missile Development," <u>Public Policy</u> 25 (Winter 1977): 120-167 (denigrates the bomber generals for not embracing cruise missile technology). The more hyperbolic comments during the 1980s CAS plane debate involved those who thought the opposing side was too dense to see reason. The post-Desert Storm criticism of GEN Horner and others for not grasping COL Warden's strategic air campaign vision also reveals the negative attitude toward any military leader who does not embrace the latest technological development. agencies and units, and the countless acronyms. Certainly, the mere process of acquiring a front-line tactical plane is almost too complex to accomplish *or* recount. Instead, one looks at the more general influences which guided the service and its attitude toward CAS and its plane. These are complex enough.

From the start, the airmen were technologically enthusiastic because they had to be. World War I demonstrated that even slight aircraft inferiorities could be fatal in air combat. The postwar economic deprivation was an alarming condition for a warfare discipline requiring ample funding to produce its very means for existence--not to mention the training required for both pilots and mechanics. Struggling against an Army leadership with budget problems elsewhere, air leaders used public relations to garner interest and funds, and they never forgot that lesson. It is in the context of the fight for independence, respect, and funds--along with the faith that airplanes could attack enemy industries and end wars less bloodily than seen in World War I--that their neglect of tactical aviation in favor of strategic bombing can be understood. Of all these influences, the struggle for budgetary survival in order to achieve the other goals drove, and continues to drive, many Air Force actions.

To the airmen, World War II seemed a glorious vindication of nearly everything they had believed in and fought for before it started. But if anything, this war gave them misconceptions under which they labor even to this day. (That they are still fixated upon it is revealed in the fact that the AFHRC and one other prominent Air Force historian wanted the author to pick a World War II air combat topic for this dissertation!) For the next several years, the bomber leaders thought the war told them that their planes and nuclear weapons were the means of fighting future war. These officers saw airpower as the ultimate firepower solution which overshadowed all other types of warfare. In the longer term, World War II confirmed the fighter men's belief that fighting for air superiority with inferior equipment was a fruitless and fatal task. Further, it gave them a reverence for high performance fighters which flew any kind of mission. They did not see the subtleties in these results. The P-51 and P-47's air support success was based upon fighter performance *of that time*. Not only that, but leaders like General Quesada made the fighter pilots learn the mission. They forgot that these planes did *not* fight their way into and back out of the CAS target area against enemy fighters; or that less capable planes flew CAS in areas where air superiority was not actively contested. Instead, planes dedicated to air superiority took care of that problem. Nonetheless, the belief in, and desire for, planes that could almost simultaneously do *both* CAS and air superiority missions remained.

This faith that newer versions of the multirole fighter would always appear was an overall legacy of the war. The airmen recalled that they had *foreseen* how their technology would affect the war—in some cases even before certain machines had been developed or even invented. To the air leaders, their predictions all came true. It had been so! Their foresight created the planes and strategies which vanquished Hitler and Tojo; otherwise, the consequences were too horrible to contemplate. The technology would always come to pass and function in the manner prescribed; and the anti-military jibe, "Generals are always fighting the last war," did not often apply to the Air Force leaders' technological faith. As immediate postwar studies such as von Karman's indicated, they followed a vision of high-tech future war—at times with almost religious fervor—for they expected it to happen and save their pilots and country as it had in World War II.

Not that these men pursued these concepts against the will of the American people. The Eisenhower New Look policy, which favored strategic bombing over conventional war missions such as CAS, had the support of Americans who wanted military superiority on the cheap. It was not just Air Force generals who thought that Korea was an anomaly; most Americans wanted nothing to do with such a war again.

After another sobering encounter with conventional war, in the form of Vietnam, Air Force leaders spent some time reconsidering some of these assumptions. It was during this hiatus that the A-10 came to be. However, in the CAS arguments of the 1980s and 1990s, they assumed attitudes which were simplistic on the face of things but more complex underneath. True, the F-16 inspired many airmen to believe that at last the multirole fighter had reappeared. But one has to wonder how quickly they would have dropped the A-10 for the F-16 had not the Army's AirLand Battle doctrine and the ensuing interservice agreement, the 31 Initiatives, occurred. The importance of these two factors in combination can be seen in the fact that the Fighter Mafia and military reform types who fought the CAS F-16 program supported both AirLand Battle and the F-16 individually. In fact, the Fighter Mafia created the F-16. Budget reductions led the airmen to pursue the most efficient force structure; granted, their idea of most efficient did not square with the wars America was most apt to fight. As in the New Look fifties, General McPeak's seamless warfare concept had its attractions for Americans looking to maintain top world power status cheaply.<sup>16</sup> Again, the problem was it assumed perfect operations in a certain kind of war. Indeed, the airmen's slick public relations campaigns on behalf of CAS F-16s and interdiction warfare encountered stiff resistance from opponents too familiar with their sweeping, simplistic public relations claims in previous decades.<sup>17</sup>

If the explanations for the Air Force leadership's resistance to CAS feature some complexity or mitigating factors, the stories describing CAS and the dedicated CAS plane's fortunes do so even more. CAS itself is a seemingly simple matter of asking airmen to assist one's effort on the battlefield. However, it involves two different perspectives of the battle underway, not to mention the cooperation of two different means of conducting war itself. This work addresses the cooperation between two services with a past featuring a bitter independence struggle, complex interservice agreements, and an occasional feud. To borrow a popular phrase, CAS requires "two to tango"; if one or the other side is not interested, this mission falls apart. Executing the mission is tough, and it seems that only

<sup>&</sup>lt;sup>16</sup>Mark Thompson, "Why the Pentagon Gets a Free Ride," <u>Time</u>, 5 June 1995, 26-27. In this piece, Thompson cites now-retired GEN McPeak as saying that the U.S. needs to be prepared for only one war at a time instead of the traditional two. McPeak asserts that American forces can be reduced and "modernized" (26) to handle world wide threats. He also confidently asserts that the U.S. will never face a two-war situation because the country's stellar performance in one war will deter other aggressors. His successor as Air Force Chief, GEN Ronald Fogleman, retorts: "I'd like to be like General McPeak, and wait until I retire before I espouse my opinion on that" (27).

<sup>&</sup>lt;sup>17</sup>In his personal interview with the author, former congressional staffer Tony Battista observed that Air Force briefings were generally so slick that they invited suspicion.

the pressure cooker force of several compelling factors drives the separate players to make the considerable effort required for its success.

When condemning the bomber men's utter neglect of tactical warfare just after World War II, it is easy to forget that the Army also made little effort to maintain the air support tasking structure. Korea at least alerted the Army to the benefits of CAS, but its efforts to force the airmen to meet their agreed-upon commitments were ineffectual, in part because the Army men themselves were bedazzled by nuclear weapons. Their increasing discontent throughout the 1950s might have remained only that if not for the appearance and possibilities of a new aviation technology, helicopters. Even these aircraft required what Frederic Bergerson called a bureaucratic insurgency to secure acceptance within that service. President Kennedy's election brought forward Defense Secretary McNamara and OSD staffers who backed the Army's helicopter development. McNamara and the OSD Whiz Kids who accompanied him may not have been tactical air power experts, but their commitment to non-nuclear warfare options drove them to pressure the Air Force to accept other planes besides its beloved supersonic jet fighter-bombers. The Air Force responded with its own studies and might have resisted McNamara and the Army indefinitely had not other events intervened. Presidents Kennedy and Johnson committed the country to war in Vietnam, and the war exposed the weaknesses of the Air Force's nuclear war-oriented procurement and training policy. It also featured chaotic combat encounters throughout that country which required immediate firepower support in the form of CAS to win. The service found itself purchasing the A-1 from the Navy for Vietnam CAS-a plane that the airmen would have considered grossly obsolete even in the 1950s. Nonetheless, the A-1 upstaged the jet fighter-bombers in this mission, and helped produce pressure from another quarter, Congress. The Pike Committee hearings further embarrassed the service, but its leaders might have resisted pressure for a CAS plane even then but for yet more influence. The Army created airborne firepower through its use of armed helicopters. It looked to purchase a super attack helicopter, the Cheyenne, which fully awoke Air Force Chief McConnell to the mission and budget implications of a hostile Congress and the supported service's efforts for its own CAS aircraft.

It took this many factors to make the Air Force procure an attack plane, the Navy's A-7, and then finally to commit to purchasing a dedicated CAS plane. Even then, General McConnell braved the opposition of many of his senior subordinates, and only a fortuitous collaboration of enthusiastic Air Force and OSD staffers kept the program viable within the service. Using the pressure cooker analogy once more, the contents must remain under pressure or else the food goes uncooked. Also, any leak or break in the seal may cause the contents to fly in all directions. Now that it aspired to have its own CAS machine in the Cheyenne, the Army--the other half of the CAS equation--cooled to the Air Force's CAS plane program. Indeed, one wonders how this story would have ended if the Cheyenne project had somehow succeeded and the Army then braved an interservice war with the Air Force on behalf of its own machine. The Cheyenne's ensuing problems did not necessarily mean that the A-X was off the hook, for then there would be no Army mission threat to justify the program to the many Air Force A-X opponents. Further, as the Vietnam War went sour for Americans, an increasingly irritated Congress questioned funding even inexpensive CAS planes. Congress always influences force structure since it controls the budget; its resistance to CAS plane spending at this time marked its transformation to a more consistently activist role in CAS plane affairs. However, congressional action instead had the opposite effect of helping the A-X's progress. In this case, it led Air Force leaders to protect their CAS mission prerogatives, such as continuing the A-X program, when the Cheyenne's demise might have led them to kill it. It also sparked the statesman-like actions of service secretaries Stanley Resor and Robert Seamans. Their agreement on the complementary worth of both attack helicopters and dedicated CAS planes allowed the services to present a more unified front to the legislators. This act, the Cheyenne's failure, continued Army interest in attack helicopters, Army concerns about Soviet tank strength in Europe, and a growing spirit of cooperation between Army and Air Force leaders helped keep the plane alive through the 1970s' challenges. These challenges included a Senate hearing convened to pick one CAS plane for all the services, a congressionally directed flyoff against the A-7, challenges from Congress on behalf of the even simpler Enforcer attack plane, and the OSD and

congressionally pressured TASVAL test exercise pitting A-10s and attack helicopters against one another. (The mission's complexity and the senators' own parochial preferences also defeated their effort.)

Multiple factors, such as relentless congressional skepticism, turbofan engine development, combat results in the 1972 Vietnam Easter offensive and 1973 Yom Kippur War, and doctrinally induced scrimping on the A-X budget helped the CAS plane's performance capability. Air Force and congressional budget restrictions put the A-X project in an innovative development funding program, design-to-cost, which held the plane to its promise of simplicity and maintainability. Experts argued over whether the A-10 met its planned per-unit cost, but it certainly came closer to meeting its goal than any other jet the service procured during this time. Indeed, the plane was cheap enough that the service reintroduced yet another procurement practice: flight competition between the two leading industry candidates. Regardless of the losing A-9's political sponsors' complaints, the service thus further ensured that it bought the best plane in the A-10. In fact, cost concerns led to the extraordinary step of an Air Force investigation of the winning contractor and the ensuing shakeup within its management. The appearance of efficient turbofan engines guaranteed that the plane would use a more powerful jet engine while avoiding the traditional problems with jet fuel consumption. The wars and congressional pressure also spurred the service and the motivated staffers running the program to guarantee the plane's viability. They introduced yet another procurement concept, realistic testing, when they fired Soviet AAA rounds at aircraft components in a wind tunnel to determine their durability. They also used combat-loaded tanks to demonstrate the GAU-8A gun's effectiveness. Also, two flyoffs, the TASVAL test, and the LAVP evaluation, guaranteed that the A-10 was the plane for the mission.

The remarkable confluence of factors which created the A-10 fell apart in the mid 1980s. The Army's AirLand Battle doctrine cooled that service's leaders to traditional CAS. This was enough to convince the fighter men running the Air Force that their dream fighter, the F-16, was the new CAS plane. Not only that, but this time the Army possessed

an advanced attack helicopter, the Apache, which gave at least some leaders within that service the confidence that they could do CAS on their own.

What saved the A-10, or at least the CAS plane concept, was the constituency which grew up around it in various quarters. It created enough delay and doubt about the Air Force's course of action—in spite of the service's own intense public relations campaign—to allow other factors to keep it alive. Among these factors were the shrinking budget which forced the service to abandon purchasing all-new, CAS-dedicated F-16s to replace A-10s. Congressional threats of further harassment also kept the service honest about its CAS commitment, and this included keeping A-10s. Finally, a real test of the plane, Desert Storm, intervened. In spite of some people's efforts to diminish its accomplishments, the Warthog did well enough to defeat doubts about its usefulness.

# **Technological Constituencies**

Indeed, constituency is another issue pertaining to technology history, and technology constituencies certainly applied to this case. People become attached to a certain technological device or practice due to investment of money and time, professional judgment and reputation, or extensive training and operational use. Political scientists call it "cybernetic behavior," a term whose pejorative overtones conjures the image of people who are no better than idiot-savant automatons, incapable of open-minded, deductive reasoning.<sup>18</sup> But constituents for any technology are not a mindless lot. All see some kind of advantage in a device, or practice; one might say that a constituency is a loose, conditional mix of enthusiasts, salesmen, and opportunists! There are times when one might accuse either CAS opponents or CAS proponents of cybernetic thought. However, all of these people had concerns that they believed experience, economic wisdom, studies, etc., proved were legitimate.

Indeed, Air Force leaders are an air power constituency, and their paranoia about fiscal support guarantees it. Airplanes form the basis of the service's existence, but they are

<sup>&</sup>lt;sup>18</sup>Levine used the term in a deprecating manner when referring to bomber generals in his "Some Things to All Men" article.

expensive to build, maintain, and fly. Training, and skills maintenance, for the pilots, technicians, and other supporting players are likewise expensive. Congress controls the budget for all of these things, and in order to sell their programs to hostile or neophyte legislators, Air Force officers learned early on that they needed to conduct ironclad, compelling sales campaigns. *This* is often the source of the sweeping claims for air power's supremacy, or for some plane or mission's superiority.<sup>19</sup> The Air Force's proposed new technology (pick one) will pass congressional muster if the service's leaders create a sense of urgency by making the new device seem the superior answer to the imminent dangerous obsolescence of the current device. Air Force leaders' behavior during the 1980s CAS plane debate is a prime example of this behavior. One can understand their concerns, but these create a rigid, budget-oriented approach to the flexible tactical situations that this country faces. They also generate the frequent arrogant dismissals of lower priority missions like CAS.

Within military services, there can be a variety of constituencies. Indeed, this work demonstrates that even the Air Force is not a monolithic group, for there are advocates for various technological policies within both it and the Army. One example involves the Air Force bomber men's belief in their planes and the strategic bombing mission in the decades immediately before and after World War II. The bomber represented an opportunity to demonstrate the air power in which they believed so fervently. Another example is the Army helicopter advocates' efforts on behalf of their machines. Like the Air Force bomber men, their loyalty grew through initial insurgent actions, followed by increasing commitment of money, developmental effort, force structure, and actual combat use. The latter factor was important in the fighter pilots' loyalty to planes featuring the highest attainable speed. It was axiomatic that top performance equalled survival and victory in

<sup>&</sup>lt;sup>19</sup>Mason, <u>A Centennial Appraisal</u>, 237-239. Mason cites a 1993 AFA report which admits that roles and missions issues were funding issues. The report also pointed up the Air Force's consciousness that because planes flew over both land and sea, its missions overlapped into other services' responsibilities. Mason also recounts McPeak and other Air Force leaders' assertions for air power during this time.

combat. Finally, not everyone in the Air Force and the Army thought that the CAS F-16 idea was a good one, and these people in turn spurred more vocal opposition by others.

Military constituent groups in turn have their own backers. Author Bergerson recounted the Army helicopter advocates' cultivation of support from senior officers and key politicians. During the 1971 CAS hearings, the senators' resolve to settle the services' uncompromising stand on their preferred CAS aircraft failed due in part to the senators' own pursuit of their favorite service's warfighting preferences. Technological enthusiasm can also form a basis for constituent support, and one example involves those people who publicly tout the AV-8 Harrier as a means of keeping alive the VTOL concept. Another example is the 1980s CAS plane debate. Before the debate started, military reformers praised developments which matched their own vision of warfighting and military technology, such as AirLand Battle and the F-16. As the debate waxed more intense, supporters of attack helicopters and the F-16 extolled these weapons' strengths as they battled reformers now alarmed by the implications for a favored mission, CAS.

However, as the Air Force's concern for congressional opinion makes clear, Congress serves the most obvious technology constituent support function. As former Congressman Robert Giaimo told the author, it is the representatives' constitutional duty to give their constituents' concerns a public hearing. That includes aircraft manufacturer constituents, and if the hearing decides against them, then so be it. (Giaimo added that the last time Americans gave up on this process, it was called the Civil War!) Another reason why the senators could not resolve the 1971 CAS plane impasse was because some of them pursued a constituent's case for a certain aircraft. Besides this example, there were other congressional actions on behalf of constituents which affected the CAS plane story. The Texas congressional delegation continually pushed the A-7 and even helped secure for it a flyoff against the A-10. Senator Strom Thurmond's Enforcer advocacy helped make the Air Force ensure that the A-10 met its cost and performance goals. Reformers and ex-Marine staffers fought the CAS F-16 in the 1980s. Indeed, the 1980s debate opened the gates for congressmen who wanted constituent planes like the Harrier examined for the follow-on CAS plane role. The A-10 had some congressional and corporate constituent support early in its life, but it lost both as the 1980s CAS plane scrap escalated. Fortunately for the Hog, its constituency came from elsewhere.

In fact, the CAS mission and airplane constituency was an intricate coalition of individuals and groups. In the A-X's formative days, it featured a mix of former A-1 pilots turned Pentagon staffers, Air Force staff and leadership intent upon preempting the Cheyenne, and energetic supporters of the plane like Pierre Sprey, Tom Christie, and Bob Dilger. Christie and Sprey formed part of the Fighter Mafia, skilled military staff insurgents who pushed the A-10's, and later the F-16's, case. This group in turn formed the backbone of the 1980s military reform movement, a loose alliance of reporters, congressmen, as well as OSD and congressional staffers. As author Jim Burton put it, the A-10 was a symbol of the reform movement. It exemplified the reformers' insistence upon simplicity and functionality. (This was in spite of many lawmakers' opposition to the plane in the 1970s.) Though these people abandoned the A-10 for Chuck Myers' Mud Fighter during the 1980s CAS plane debate, they still played an important role in delaying Air Force action until other factors intervened. Their actions at least kept the CAS plane issue alive, for the A-10's New York and Maryland congressional constituency disappeared with Fairchild's departure from military aircraft construction. In the meantime, the A-10 specifically received some support from the Air Force A-10 community itself. Indeed, military historian Harold Winton and others pointed out that the Hog's existence meant that there were CAS advocates within the Air Force. (These people and their planes also were the Air Force's operational guarantee of support to the Army.) And though congressional staffer Jim Ringo understandably supplied no names to the author, A-10 pilots were sources to reformers challenging the Air Force view. Along this line, there were nameless Army officers who bucked their leaders' public statements and told the reformers that they favored the dedicated CAS plane over the hot rod fighter.

## **Technological Ironies**

The latter item introduces yet another feature of technology history and especially accounts discussing military technology: the ironic fortunes of technological devices and

the people involved with them. Many ironies exist in this story, and only the more prominent shall be discussed here. There is the obvious paradox in the Air Force leaders' wish to substitute their firepower solution-strategic bombing in earlier decades and JSTARS-controlled interdiction nowadays--for other firepower missions such as CAS. The Army's attitude toward the CAS plane is another irony. Over the years, the impression arose that the Army unanimously and consistently supported the Hog against the wishes of Air Force leaders. After all, here was an airplane designed from the ground up to support the troops.<sup>20</sup> However, this work has proven several times that this was not true. After the A-X program got underway, Army leaders saw it as the preemptive move against the Cheyenne that it was. Their support remained at best lukewarm until the Cheyenne failed and they needed firepower to halt the potential Soviet armored onslaught in Europe. After they promulgated the AirLand Battle doctrine, the Army leadership backed away from CAS and the A-10 yet again. This time, the Apache's existence and the Army's desire for another expensive attack helicopter led Army leaders to accept the F-16 in return for no Air Force resistance to their attack helicopter aims. There also were many in the attack helicopter constituency who believed that their aircraft could do CAS on their own (though as mentioned, not everybody in the Army supported either this or the CAS F-16). Even after Desert Storm, some Army people rejected the A-10 in favor of the Apache.

Besides the Army, Congress was not always the CAS plane's friend either; though one can at times fall into the trap—as both Air Force A-10 opponents and reformist A-10 supporters have—of thinking that the legislators unanimously made the service buy the Hog. Congress is a highly diverse body, and its members have varying opinions, constituencies, and degrees of influence. The lawmakers' support for the CAS plane waxed and waned depending on their mood and who among them could make their influence stick. Certainly, there were times when certain lawmakers consistently pressed a service's or a corporate client's case. One example is Senators Goldwater and Symington's

<sup>&</sup>lt;sup>20</sup>The alleged Horner-Schwarzkopf Desert Shield exchange about A-10s; Anderson and van Atta, "Air Force Plan Encounters Army Flak"; and Meyer, "For the Guys on the Ground" are a few illustrative examples.

advocacy of the Air Force during congressional hearings. Yet another is Senator Thurmond and the Texas congressional delegation's respective efforts to secure Air Force purchase of the Enforcer and the A-7. However, the inconsistencies driven by the spirit of the time and lawmaker diversity are remarkable. First, former Marine aviator Otis Pike pressed the Air Force to buy a CAS plane in the 1960s. The 1970s featured congressmen who opposed the CAS plane due to support for a constituent's plane, alarm over military spending, and concern about recent tactical air combat results. (This created another irony in that it inspired Air Force leaders, who normally thought little of CAS and its planes, to deliver a superb CAS plane!) Then, congressional military reformers fought for its survival in the 1980s. One certainty is that since its budgetary authority controls the force structure, Congress' interest in CAS issues cannot be ignored.

The A-10's existence represented an important irony in the evolution of tactical plane design. As designer Hans Multhopp observed as early as 1966, ever faster speeds were not necessary for all tactical planes. In fact, certain aircraft types paid serious performance, fuel consumption, and financial cost penalties for extra speed. The CAS plane's optimal design did not require high speed; slower speeds and good maneuverability better guaranteed accomplishing CAS. And though advanced fire control avionics helped the Hog in the end, simplicity which lowered costs and guaranteed better aircraft availability was preferred. Indeed, in some people's search for ever more simple air support planes, the A-10 project found itself challenged by the Enforcer--a plane that was cheaper, slower, simpler, and more underpowered than it was!

The A-10 is an example of the maturing of air warfare technology. At least some observers realize that there are legitimate air combat missions and scenarios that do not require the most sophisticated and most high-performance machine. Multhopp made this point in his 1966 essay. British Air Vice Marshal Tony Mason's more recent historical survey of air combat also points out that air warfare now features different spectrums.<sup>21</sup> There are the higher-technology conventional wars like World War II or Desert Storm that are so dear to U.S. Air Force leaders. And then there are the lower-technology fights such

<sup>&</sup>lt;sup>21</sup>Mason, <u>A Centennial Appraisal</u>, xiii.

as Bosnia or Vietnam. The A-10 can flourish in the former if the conditions are right, but it is particularly well suited to the latter.

On the other hand, one wonders at the irony of helicopters which the Army initially procured to have a cheap, organic means of aerial fire support. That service encountered the same trap which sometimes afflicted the Air Force: the pursuit of ever greater technological capability for its tactical machines at the penalty of exploding cost. Indeed, the advanced attack helicopter designs from the Cheyenne to the Comanche all cost almost as much as jet fighters.<sup>22</sup> Not only this, but as helicopter advocate John Bahnsen observed with some alarm in 1986, some Army attack helicopter people increasingly viewed themselves as a group divorced from the other Army combat arms. General Momyer predicted something like this 1971 when he observed that Army aviators, like any other aviators, would always want extra capability for their machine.

Concerning wars such as Desert Storm, another irony involves the difference between what a device is designed for and how it is actually used. The P-51 began its World War II operational life as an air support plane and ended up as one of the war's greatest fighters. On the other hand, the P-47 was the Army Air Force's choice for air superiority missions and did well at them--but it was even better as an air support plane. The A-1's designers probably never imagined at its 1945 rollout that it would fly in a war twenty years later and even shoot down jet fighters. Even the A-10's supporters did not claim for it anything other than a close air support capability; but in Desert Storm it flew other missions that Air Force leaders during the CAS plane debate said it could never do. The war opponent in Desert Storm was not one of the world's greatest military powers, but Iraq still possessed an impressive array of sophisticated air defense weaponry. However, as slower planes successfully accomplished air support in less hotly contested areas during

<sup>&</sup>lt;sup>22</sup>Paul Proctor, "Brisk Orders Accelerate Apache Production," <u>AW&ST</u> 148 (30 March 1998): 32-33; and Loren Thompson, "On Track: Comanche Still Clings to Army's Number-One Modernization Spot Despite Ups and Downs," <u>AFJI</u> 135 (April 1998): 40-42. Proctor notes that a new Apache now costs \$20 million. Thompson does not mention the Comanche's cost, but its performance and armaments package are very similar to the Apache's. The Comanche's avionics kit will also be more advanced.

World War II, so Hogs flourished in interdiction, SAR, Scud hunting, and even flak suppression missions after coalition airplanes suppressed the most lethal Iraqi defenses. Technological tools do not completely drive people's actions; people take the tools and make the best use of them given the situation.<sup>23</sup>

# Technological Media and the Pitfalls of Any Technological or Scientific Study

The planned and actual uses of technology recall how people argue their case for technology's proper utilization. The players in a technological debate use all available media to make their case, and this includes the studies which many consider to be unbiased assessments. Though the mainstream news media ignored the CAS plane debates of the early 1970s and late 1980s, the defense media became the forum for free-style expression of opinion as the various sides jockeyed for advantage. Some of these entries could be regarded as original sources, since they were pronouncements by the principal actors or their allies. Then there were other venues, such as the AFA's <u>Air Force Magazine</u>, that were so wedded to one side's leadership that they served as its mouthpiece. Indeed, the Air Force had demonstrated a knack for public relations from its beginnings, and even used its publicity skills on behalf of the A-10 in the 1970s. However, these strengths faltered during the 1980s CAS plane fracas, as even people within the Air Force's ranks questioned some of its more hyperbolic claims. Finally, as seen in this work, congressional hearings especially provided opportunities for people on both sides of the panel to make their case, whether their facts were correct or not.<sup>24</sup>

<sup>&</sup>lt;sup>23</sup>The GAO's "Operation Desert Storm" report also points out the diverse uses of other planes besides the A-10. See Hinton, "Operation Desert Storm," GAO, 207-209.

<sup>&</sup>lt;sup>24</sup>Pierre Sprey, no stranger to Washington goings-on, reminded the author in the personal interview that the legislators also have the opportunity to edit their hearings testimony. He also told his Air Force Oral History interviewer that most government documents rarely reflect all of the issues involved, since those are handled verbally; see Neufeld, Sprey, 29-30.

One might think that formal studies and tests of a process or device would provide a break from parochial promotion, but they address topics so complex that their conclusions cannot avoid the taint of bias. The premises for any of these activities often favor one or another conclusion, Indeed, they have to, given the diverse ways in which a technological apparatus can be used. When McNamara's systems analysis Whiz Kids asserted that slower attack planes were more operationally efficient than the Air Force's fast jet fighters, the airmen delivered their own systems analysis study concluding that the F-4 supersonic interceptor was better than any attack plane! The pre-Vietnam competing tests involving Army helicopters and Air Force fixed-wing jets provide other examples. The best testing could at times be actual combat. Air Force leaders could not dodge Congressman Pike's pointed questions about poor jet CAS performance in Vietnam without looking stupid.

Computer postulations were the modern American military's studies of choice, but they obviously contained traps. As General McConnell in 1965 wrestled over deciding for attack planes or another jet fighter, his staff conducted massive computer studies which produced conclusions supporting both choices, depending upon which inputs they supplied to the computers. Also, differing opinions over the computer's ability to make accurate predictions generated serious friction between the Army and Air Force weapons labs on one side, and the GAU-8A's proponents on the other. The GAU-8A side suspected that the computer studies might be used to denigrate the gun's effectiveness somehow, and so introduced the concept of realistic testing to prove its worth. As Bob Dilger recalled, movie film of A-10s blowing up tanks silenced the critics. However, real tests also had suspicious underpinnings and findings at times. The A-10's flyoff against the A-7 featured conditions which obviously favored the A-10's performance characteristics. One may counter, and rightfully so, that the test aimed to prove the A-10 the better choice for antitank CAS in Europe's often shabby weather. However, one wonders what the setup would have been had the Air Force and Army needed a plane for CAS elsewhere. The TASVAL test was supposed to be the most heavily instrumented yet seen in U.S. military history. It tried to judge how well A-10s and helicopters flew air support against the tough

defenses that everyone was so worried about after the 1973 Yom Kippur War. Indeed, Congress and OSD had talked of doing this since 1971 in order to determine which air support aircraft best rated continued service. As such, TASVAL could have been a flyoff between A-10s and helicopters to determine which would suffer the congressional axe, but instead, the services used this most instrumented of tests to demonstrate that JAAT enhanced the survivability and effectiveness of both aircraft. The finding was true, and ultimately benefitted the services and the nation. However, it implied a rejection of congressional scrutiny.

The studies conducted during the 1980s CAS plane debate were yet one more example, as even some of the people involved later observed that the studies backed their sponsors' intentions (some people also said this of the GAO reports). This time, the Air Force used flight testing against the A-10 when it conducted CAS F-16 technology demonstrations that appeared suspicious to some observers. Ironically, perhaps the most unbiased and "scientific" study from this period, the Toomay SAB study, did not receive much attention from either side, since it recommended modifying the A-10 for extended life until a replacement dedicated CAS plane became operational. As such, it did not fit either side's preconceptions.

The congressional and military reaction to the Israeli Air Force's air support fortunes in the Yom Kippur War shows that even war itself can be used to convey certain conclusions--though this can be tricky.<sup>25</sup> People concluded from the IAF's heavy losses that modern SAMs and AAA rendered tactical air support obsolete. Further, they took to heart the IAF leaders' assertions that CAS was not a worthwhile mission anyway. The defenses truly rated serious attention, but observers overlooked the extraordinarily dense defenses the Arabs set up to trap the IAF, as well as the IAF's lack of preparation for them. Further, since the Israeli Army had soundly whipped every Arab army it had faced in its existence, the Israelis did not need CAS much. This was another reason why, in the

<sup>&</sup>lt;sup>25</sup>In spite of his bold "always" assertions about the nature of air support, Hallion did at one point observe that people can take different lessons from wartime results when he discussed air support in the Spanish Civil War. See, <u>Strike</u>, 110.

October War's early days when the Israeli Army briefly and acutely needed assistance, the IAF was not prepared to render it.

The studies conducted and viewpoints expressed during the 1980s and 1990s CAS plane debates sometimes cited past wars to make their points. As mentioned, they did not often cite the results of current wars, but the CAS F-16 side heavily used the P-47 and P-51's World War II fortunes to hail the F-16 as their successor. (They also sometimes cited the Yom Kippur War to say that any slower plane could not survive.) Frequently, both sides were simply wrong. Lieutenant Colonel Carlson gave misleading information about Korean War CAS. Richard Hallion mixed up facts about the A-10's genesis and used the word "always" to describe tactical results. And Robert Coram reported that the Air Force's neglect of CAS still "forced" the Army to buy attack helicopters. Though the Hog delivered a performance in Desert Storm which helped justify its existence, postwar observers cited the dearth of CAS during that war as proof that the mission and its dedicated plane were dead. However, they omit the fact that the ground war lasted one hundred hours and featured a demoralized enemy. The interdiction zealots claimed that this was even more proof, since air power created the situation. But who could say that these conditions would repeat themselves? One could ask what would happen if the lragis were more determined and Kuwaiti terrain was more rugged and foliated. One could also question the ability to sustain an air campaign with sophisticated planes in more primitive areas. This work is itself an extensive examination of combat results, but unlike others, it does not make sweeping "always" assertions about tactical warfighting from them.

#### CAS, the Air Force, and America

The reason this work frequently embarked upon discussions of various conflicts' results is to demonstrate that, try as it might to shun the mission, the U.S. Air Force repeatedly gets drawn back to CAS once the shooting starts. Those who praise the P-47 and P-51 CAS of World War II seem to forget that many fighter pilots did not want to fly the mission at first. They also forget John McCloy's sharp words early in the war about Army Air Force reluctance to do the mission; or how battle conditions led the air leaders to

develop procedures and *train* fighter pilots to do CAS. The Korea example is more graphic, for Air Force CAS stumblings generated public complaints by Army generals. Air Force observers have tried in ensuing years to color the results differently, but too many sources cite Army dissatisfaction with Air Force jet fighter CAS. These also unfavorably compare the Air Force jets to the Marines' Corsair and A-1 prop planes of that war. The Vietnam example is more glaring than the Korean one, for the Air Force's procurement of a nearly obsolete Navy propeller attack plane, the A-1, for CAS highlighted the service's lack of preparation. This time the public complaints surfaced in the form of a congressional hearing which embarrassed the service even more. Not only that, but the supported service seemed bent on developing its own CAS force via attack helicopters. The Air Force definitely got some sort of message about CAS, because the A-10's existence is proof.

The CAS opponents ask that one dismiss Korea and Vietnam as anomalies. But beyond the violence involved, modern warfare defies categorization into some generic form. Also, there is no modern American war besides Korea and Vietnam that reveals a desire to eschew firepower in favor of wanton risk and sacrifice of American citizen-soldiers. Americans used AC-130 and Navy attack jet CAS firepower at Grenada. Though not mentioned in the work, they even used the ultra-sophisticated F-117's firepower-along with Apaches, AC-130s, and Air National Guard A-7s-in the Operation Just Cause invasion of Panama. The CAS opponents cite the dearth of CAS in Desert Storm as another proof. Speaking of anomalies, this was a war in which Iraqi dictator Saddam Hussein allowed his opponents seven months to compose a masterpiece symphony of aerial violence against his forces-while placing his elite units in deep reserve and making the reservists and conscripts serve up at the front. The result was a one hundred hour ground war against demoralized troops, many of whom surrendered without much resistance. If ever there was a war featuring a firepower solution, this was the one--a thirty-eight day bombardment preceded the coalition ground advance! Would there have been more CAS if Saddam had advanced his Republican Guards into Saudi Arabia in, say, September 1990? General Horner's acerbic response to Colonel Warden's smug

assurances seems to indicate yes. In later years, A-10s have done yeoman work for UN observers in Bosnia, while the public lamented the loss of troops in Somalia. (As this author proofreads this work, A-10s are striking Serb Army positions in Kosovo.)

And what of wars between other nations? CAS opponents sometimes point out that, with defense drawdowns, the U.S. Air Force will be like foreign air arms and have to delete CAS due to its expense. The British disparaged the mission but found themselves doing it in the Falklands War. The Russians used it in Afghanistan, and their post-Stinger inability to aggressively fly CAS was one of the big reasons for their ensuing withdrawal. The South Africans finally stopped doing CAS in their war with Angola, but even their chronicler admits that they did not pursue the war aggressively. The star example used by CAS opponents is that of the Israelis. The IAF laughs at the mission, and lets its helicopters do CAS. However, the Israeli Army routinely beats its Arab counterparts, so CAS is normally not needed. When IAF CAS was necessary, as in the Yom Kippur War's early days, the IAF was not ready to fly it, which only confirmed the Israeli airmen's low opinion of the mission. And in spite of the losses and the occasional foul ups, the IAF still received credit for helping to save its army in those desperate hours.

The biggest thing to remember is that the U.S. is *not* Israel. America is not a small desert nation which can finely tailor its forces to fight specific enemies only in specific desert locations. It is a world power with potential conflict liabilities in many different locations featuring wide variations in terrain, climate, military technological prowess, nationalities, and associated warfighting styles. It may have the luxury of setting up its full complement of firepower technology as it did in Desert Storm, but historically it fights the war as is. This means that urgency, the gravity of the threat, or some sort of restriction may prevent the tanks, the Apaches, and the JSTARS from functioning effectively or at all. This is when the beleaguered American troops want heavy firepower from the air.

Heavy firepower brings up another point about CAS. As even Army leaders point out, attack helicopter fire support is not CAS. Helicopters provide organic firepower, and like the old horse cavalry, serve as rapid maneuver elements. Though the latest models like the Apache and Comanche carry an impressive armaments kit, they still do not possess the ordnance-carrying capacity of fixed-wing planes. They are also not able to deploy as quickly and as far as fixed-wing planes. Indeed, they are carried in transports to distant fronts (as of this writing, they are being deployed in a weeks-long process to the conflict in Kosovo). More importantly, their performance and design make them much more vulnerable to air defenses, as Lam Son 719, Grenada, Afghanistan, and the Army's conservative use of Apaches in Desert Storm indicate. Further along this line, the most advanced American attack models are not cheap, so they cannot be committed flippantly against known air defense opposition. JAAT operations enhance the survivability and effectiveness of both helicopters and fixed-wing planes, but helicopters are not stand-alone CAS assets.

CAS critics cite survivability as another unresolvable CAS problem. Ever since World War I, the mission has proven to be a dangerous and costly military enterprise. The A-10 was built to account for this, but CAS opponents claim that air defenses--especially the Stinger missile and its foreign imitators--are so lethal that even fast jets will have to use stand-off weapons. Therefore, traditional CAS is allegedly defunct because airplanes cannot fly close enough to the battle to discern friend from foe. This buttresses some critics' desire to have sophisticated fighter-bombers and precision stand-off weapons do the mission by shooting target locations down-loaded from data link receivers. One cannot resist pointing out that the same devotion to technology that breeds this confident assertion for high-technology air support should also spark a countermeasure for the Stinger. Apparently, Soviet fixed-wing pilots in Afghanistan countered the SAM somewhat without completely running away from it. One does not denigrate this threat, or the stand-off weapons designed to counter it, but such threats are not always a factor either. CAS will remain dangerous whether Stinger is countered or not, but CAS nonetheless remains an important mission for American forces.

For all the words about close air support's importance, this work does not take some military reformers' view that CAS is of a doctrinally higher priority for the Air Force than air superiority and interdiction. Not since the nuisance "bed check charlie" raids in Korea have enemy airplanes attacked American troops. Indeed, during most of World War II, American troops did not have to worry about enemy air attacks. Many Air Force people say that air superiority is the greatest air support. For the air effort expended, interdiction, if done well in the right situations, can also affect a campaign to a greater extent than CAS. Desert Storm stands as proud testimony to that fact. However, it is hard to understand an air arm that works so hard to achieve air superiority and then *wants* to squander the effort by retreating from a legitimate airpower mission aimed to exploit it. Army leaders want the air arm to provide CAS, and Congress wants the air arm to provide CAS, yet many air leaders ignore it or resist doing it.

In the wide spectrum of possible warfighting scenarios, situations exist where airpower can play the dominant role-the 1995 air strikes which made the Bosnian Serbs accept peace talks are one example (though attacks upon the Bosnian Serbs by Croatian ground forces helped). However, the vast majority of wars involve somebody on the ground seizing territory and/or forcing the surrender of someone else on the ground. The air leaders may not like the difficulty of CAS-and this reality forms the core of any CAS opponent's argument-but the American desire to wage foreign wars with firepower in order to save citizen-soldiers' lives has made, and will make, CAS compelling for this nation. This may sound simplistic, but one must not forget that in America, the soldiers, their friends, and their relatives can all vote. Congress does not forget it, and in all the congressional hearings on CAS, every legislator expressed unreserved support for the mission. This was the case even in the 1971 Senate CAS hearing or the other 1970s hearings where the lawmakers wanted only one CAS plane or questioned the need for the A-X. They still wanted the American soldier to get the best air support possible. They questioned the A-X because of concerns about its effectiveness or because they thought a constituent's plane could do the job as well or better. As mentioned, congressional interest must be heeded, and the elected representatives want their citizen-soldier constituents to get the best support, Air Force doctrine or no Air Force doctrine.

## The Air Force and the CAS Plane

The Air Force leaders seem afraid that devoting resources to CAS detracts from their force structure setup for achieving the doctrinally prime mission of air superiority--as if they represent a Third World nation trying to determine the best bargain on a squadron's worth of planes that they can barely afford to buy. They point to the 1990s defense budget reductions as forcing their hand. One understands their concern, as well as the experiential background that drives it. However, they planned on changing the mission to something more related to interdiction before the fiscal cuts got serious.

The Air Force needs to grow up. Again, one understands the traumatic lesson from the early years about budget considerations and force structure. But the service must understand that, as the Royal Navy was the shield of the British Empire in the nineteenth century, so American airpower performs closest to that function for American foreign affairs in the twentieth century. Desert Storm and ensuing American actions indicate that the Air Force and the Navy's air arm will retain that function into the next century. Rather than eagerly seizing upon an excuse--strategic bombing, AirLand Battle, helicopters, and budget reductions--to move away from the mission with alacrity, the service should embrace both it and the resources required as a legitimate part of its doctrinal charter.

The author understands that these are easy words to say when Air Force leaders in the 1990s face a political leadership taking away their assets with the public's tacit approval. And for that matter, American political leaders and their constituents, the American people, need to grow up when it comes to conducting a coherent foreign policy. They must understand that if they want to exert American power around the world, then they must support it. One notices that regardless of the party in power and the reason given, American foreign policy has been, and apparently will remain, activist.<sup>26</sup> To the soldier entering battle, the reason for the commitment is immaterial at that moment. In spite of the Cold War's demise, American military commitments have increased, not waned. Asking

<sup>&</sup>lt;sup>26</sup>Krauthammer, "How the Doves Became Hawks," 74; Mears, "Now It's the Democrats Turn," 4A; and Will, "History Revs Its Engine," 90.

for more political support for military spending in a perceived time of peace is a tall order, but one cannot finish this work without saying it.

This is why the CAS plane should be a part of the Air Force's order of battle. Some Air Force leaders agree that the mission is necessary, but that it must be with F-16s in accordance with budget restrictions and the new, interdiction-oriented manner of CAS. In General McPeak and Price Bingham's perfect world, traditional CAS is wasteful and unnecessary compared to interdiction of the enemy army's reserves. However, this work amply demonstrated that CAS with fast jet fighters is possible but by no means the most efficient way. And in exerting its influence around the world, the United States encounters less than perfect situations requiring different weapons to achieve victory with a minimum of losses. Using the Royal Navy example once again, even during the battleship construction race with Germany in the early twentieth century, Royal Navy officers retained other types of ships in order to maximize their ability to handle other contingencies (one could even point out that the World War I Royal Navy leadership's other combat experience was riverine warfare in the colonies). They did not eagerly get rid of destroyers, submarines, and gunboats because these craft could not survive the "high threat environment" of a battleship gun duel.<sup>27</sup> They understood that their mature warfighting arena required a spectrum of combat technology. Even American Admiral Thomas Moorer made this point about the modern U.S. Navy in his 1971 Senate CAS hearings testimony.

<sup>&</sup>lt;sup>27</sup>See Robert Massie, <u>Dreadnought: Britain, Germany, and the Coming of the</u> <u>Great War</u> (New York: Random House, 1991), 373-374; and the following essays in J.R. Hill, <u>The Oxford Illustrated History of the Royal Navy</u> (Oxford: Oxford University Press, 1995): David Brown, "Wood, Sail, and Cannon-Balls to Steel, Steam, and Shells, 1815-1895," 200-226; and CDR James Goldrick, RAN, "The Battleship Fleet: The Test of War, 1895-1919," 280-318.

Massie describes how, after the Napoleonic Wars, the Royal Navy reoriented to what would now be called low-intensity conflict. Interestingly, Goldrick criticizes the early twentieth century Royal Navy's overemphasis upon battleships and its leaders' Mahan-induced expectation of a decisive battleship clash that would decide the outcome of the war. This sounds roughly similar to the Air Force's emphasis upon a clash of the most advanced fighting aircraft in a conventional war like Desert Storm, World War II, or the Yom Kippur War.

It is time the Air Force realized this for its own order of battle. It supports an activist world power's foreign policy, and must be prepared for the contingencies that this entails. Otherwise, it risks the embarrassing call back to traditional CAS, using planes that are optimum for the role, that it has encountered time and again in its existence. The current CAS plane was born from a fortuitous set of circumstances, and these factors also helped guarantee that it met the historically revealed characteristics for the optimum CAS plane. The A-10 continues active service to this day. For all the Air Force's talk of the new means of warfare, the service finds itself repeatedly using the Hog in enough contingencies to make Hog drivers feel overworked.

Again, the author does not ask for an Air Force of only CAS planes, or even mostly CAS planes. To use the Royal Navy example one more time, England's battleships did not fight often in World War I, and their one major fight was tactically inconclusive. However, they did their part in holding the enemy's surface fleet at bay. Thus, the Air Force's other, more high technology missions and planes are as important as those involved with CAS, for fights such as Desert Storm and the Yom Kippur War also happen. Though other Air Force officers criticized his Fighter Roadmap as unrealistic, General Russ at least was on the right track in wanting a tactical air force which featured a central core of multirole planes with smaller groups of specialist planes. Even in the midst of his more outlandish statements on behalf of the F-16 during the CAS debate, Russ told a reporter that this was his aim.<sup>28</sup> Later, he told the author the same thing.

Implied within this vision is the author's previous assertion that air superiority is the Air Force's number one mission. Historically, CAS is hard to accomplish without it, and therefore, F-15s, F-22s, and AWACS planes are necessary. Along with them exists a larger core force of F-16s and F-15E fighter-bombers, which can be used optionally to support the tactical mission deemed most important at that time by the theater commander. Beyond that are specialist planes for interdiction/strike: Joint Strike Fighters, F-117s, B-1s, B-52s, and even B-2s. And for CAS, there are dedicated CAS planes like the A-10,

<sup>&</sup>lt;sup>28</sup>Amouyal, "Tactical Wings Fight for Parity," 22.

AC-130, or in the future, a suitable A-10 replacement. One may wonder at the mix of planes for each mission instead of only one; but even within these missions there are performance niches for specific submissions. Also, the aircraft mix makes the enemy's job significantly harder, in that air defenses cannot focus upon one machine's performance.

F-16s and F-15Es can fly CAS, just as any plane can be made to fly CAS. However, their speed, expense, lack of survivability features, distraction by diverse mission requirements, and limited loiter and/or weapons carriage capability make them less than optimum choices. (The F-15E has loiter and maneuverability problems with a heavy weapons load, and the F-16 can neither loiter nor carry a big weapons load.) As retired General Hall mentioned, they can utilize sophisticated aids such as JSTARS, data link, GPS, and their own fire control apparatus to accomplish the mission almost as well as the A-10, but these devices complicate an already complex mission. The question arises about what happens when a wartime scenario features no JSTARS, or ground units carrying only a radio or an inoperative data link transfer device. In these "fog of war" cases, the jet fighter-bombers' CAS weaknesses become glaring. Though they are fast, historical research indicates that with a load of weapons on board, their speed will not enable them to avoid the AAA and small arms fire in the CAS target area. Their proponents answer that they will not get close. However, if this is the case, it places a premium on their targeting avionics' working perfectly-these devices definitely do not work perfectly at the present time. And if these devices fail, then the fast jet aviators must either close with the target or risk shooting their own people.

As the Hogs' 1991 Gunsmoke victory revealed, giving the dedicated CAS plane some of the latest avionics modifications makes it that much better at its mission. It does not need all of them, lest it fall into the trap of modern attack helicopters, whose price tags match that of the fighter-bombers. Even if these items break, the Hog still possesses the performance characteristics to excel. Its pilots are dedicated to CAS and can fly the mission well when the need arises. Indeed, the heat of battle is not the time to fumble through CAS procedures because one flies other missions and rarely practices CAS. If the designated planes and pilots exist to practice it, CAS will not be as difficult as critics claim. Further, the dedicated CAS plane is simple and durable enough that battle damage will not be so costly or hard to fix as it will be for fighter-bombers or attack helicopters. The CAS plane deals with an arena that is as lethal as it has ever been. One trusts that the nation which built JSTARS and Stealth can also create a countermeasure that defeats the Stinger SAM that it also built. CAS requires flying as close to the target as possible, and the A-10 is designed not only to do this but also to endure many of the small arms and AAA hits that can ensue. If SAM difficulties and the Air Force's desire to minimize losses continue to force greater attack altitudes and distances, then the CAS plane's durability and loiter capability become that much more important. The CAS plane pilot must have the time to confirm the correct target, and also be able to endure hits if they occur.

However, air defenses are often not so lethal as to prevent air support. Indeed, the CAS plane's lethality, loiter, and weapons carriage capability make it the weapon of choice in the situations that this nation frequently encounters in its modern conflicts. Thanks to the Air Force's exceptional preparation for high-technology conventional wars, the CAS plane can flourish in these, as P-40s did in World War II and A-10s did in Desert Storm. However, the CAS plane is especially in its element in the other fights that are more common: the Koreas, Vietnams, Grenadas, and Bosnias. AC-130s and attack helicopters can handle some of the really low air defense fights such as Grenada and Panama as well as, or better than, a dedicated CAS plane like the A-10. Thus, these aircraft form part of the dedicated CAS team. However, attack helicopters may not be able to deploy to a conflict to help the troops. The current conflict in Kosovo points out the difficulty of rapidly deploying helicopters. Weeks passed between the decision to deploy twenty-odd machines and their actual arrival in theater. Finally, many of these wars, conventional or otherwise, feature enough antiaircraft opposition to make life miserable for both helicopters and AC-130s. In such cases, the dedicated CAS plane is still the best choice. (And if attack helicopters are available, JAAT is an option.)

If the United States wants to win overwhelming victories with low human cost in all of its fights around the world, then its forces must be diverse enough to excel in all of the varied situations that they may encounter. The historical record reveals that American leaders usually find that they need close air support for their citizen-soldiers, and regardless of the state of the most advanced combat aviation technology, they use a certain type of plane to accomplish it. One hopes that the Air Force recognizes this fact before the metal of even the sturdy A-10 becomes too fatigued for it to serve its function and its country.

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## APPENDIX: ILLUSTRATIONS

The following pictures appear in the order that they are first discussed in the text *after* the Chapter I Introduction. Not all aircraft and other vehicles mentioned in the text have a corresponding illustration.



Figure 1

B-17. It is included here since this work discussed the Army Air Force's strategic bombing orientation. To the airmen, the B-17 seemed to answer their desire for a superlative heavy bomber. Photo courtesy of the Defense Visual Information Center, March AFB, Calif. (henceforth referred to as DVIC).

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Figure 3

B-25. The pre-World War II Army Air Force abandoned smaller attack planes in favor of medium bombers such as this one. Photo courtesy of DVIC.

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Flight of two P-47s. The P-47 was the air support star for the Army Air Force in World War II Europe, and as such, inspired the airmen to later look for a fighter which could well perform multiple roles. The P-47's appearance reveals its rugged design; compare it to the P-51 in Figure 10. Painting by Stan Stokes; reproduction courtesy of DVIC.

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P-51. During World War II, the P-51 did very well as an air superiority fighter and also flew air support missions. Though not as rugged as the P-47, it also helped create the concept of the multirole fighter. It received praise for its air support work in Korea, but it was no longer the air superiority king that it was in World War II. This was the design which inspired the Enforcer; the two look very similar (see Fig. 42). Photo courtesy of DVIC.

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F4U Corsair. This rugged World War II fighter was a Marine Corps CAS star in the Korean War. Photo courtesy of DVIC.

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F-86. The F-86's swept wing design and high performance made it the choice for air superiority missions in Korea. Though very fast, it was not a truly supersonic plane. The Italian firm Fiat produced a similar design, the G.91, and various NATO air arms used it for attack missions. Painting by Charles Shealy; reproduction courtesy of DVIC.



F-100. The first of the Century Series fighters. Its appearance hints that its initial mission was air superiority, though the Air Force adapted it to the nuclear strike mission. The service used it extensively in South Vietnam for air support missions—though congressman Otis Pike questioned its efficiency in this role during his 1965 hearings. Photo courtesy of DVIC.



F-104. It is included here as another example of the "rocket sled" design emphasis of the 1950s Century Series fighters. Photo courtesy of DVIC.



F-105. Again, one can see the emphasis upon supersonic flight in the design. It was heavily used for strike missions in the Vietnam War, and even flew CAS missions—though not as well as other planes. Photo courtesy of DVIC.



A-37. The Army wanted to use the T-37 as an attack plane in the 1950s, but this did not happen. The Air Force later did modify it for counterinsurgency work in Vietnam, and it represented some competition for the A-10 during its early development days. Some wondered why the Air Force needed a new simple CAS plane when the operational A-37 and OV-10 might do. The answer was that the A-37 was slower, less rugged, and carried much less ordnance than the A-10. However, it affected the fortunes of another CAS plane competitor, the Piper Enforcer. The Air Force did not buy Enforcers for the counter-insurgency mission because the OV-10 and A-37 already fulfilled it. Photo courtesy of DVIC.

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UH-1s in formation. The jet-powered UH-1 ("Huey," or "Slick") gave the Army a helicopter that could carry bigger payloads faster than previous piston-engine models. As such, it helped propel the Army's push for a helicopter "air force," which would include armed helicopters. Photo courtesy of DVIC.



F-111. This was McNamara and the Air Force's planned multirole plane. The desire to incorporate all sorts of high performance strengths led to the large, heavy fighter seen in the photo. It is a visible example of the pitfalls involved in trying to build too much into a tactical plane. Photo courtesy of DVIC.



F-4. This was the fighter that OSD and the Air Force agreed upon for that service to accept in the early 1960s. It was a supersonic interceptor, yet the service also envisioned using it as an attack plane. It provided yeoman service in many roles for many years, but it was not the optimum CAS plane. Photo courtesy of DVIC.



A-4. This was the Navy attack plane that McNamara and company wanted the Air Force to purchase in the early 1960s. However, the Air Force rejected it as a death trap. The A-4 saw active service with the U.S. Navy through the 1970s. The U.S. Marines and Israeli Air Force used the A-4 through the 1980s, and the Argentine Navy and Royal New Zealand Air Force still fly the plane. Photo courtesy of DVIC.



A-7. The A-7 was the Navy attack plane that the Air Force purchased in 1965 so it could have an attack plane for Vietnam, head off congressional criticism, and preempt the Army's attack helicopter program. Though its maneuverability and takeoff/landing deficiencies led to the A-10's creation, it remained in Navy and Air National Guard service through the 1990s. The modified version that appeared in the late 1980s was a slightly elongated version of the model shown here. Photo courtesy of DVIC.



F-5. The Air Force used it as a low-cost fighter and claimed that it was also an attack plane. It was also the A-7's competition as the Air Force leadership struggled to find a plane to compete with the Army's attack helicopters. The Air Force chose the A-7 for the attack plane role after much thought. As such, the service's indecision further reveals how much it preferred fighters instead of attack planes. The A-7 is an attack plane designed to carry bombs. The F-5 looks like, and *is*, a fighter. Photo courtesy of DVIC.



T-28. It is the plane in the background (the one in the foreground is a Swiss Pilatus trainer). The U.S. and Vietnamese Air Forces used T-28s in Vietnam in the early 1960s. The plane could not carry much ordnance, and some models were so age fatigued that their wings fell off during maneuvering flight. The Air Force turned to a bigger, faster, and more rugged propeller attack plane, the A-1. Still, T-28s flew Southeast Asia counterinsurgency missions until the 1970s. Photo courtesy of DVIC.



A-1 two-seat version in Vietnam. One more A-1 illustration is included to emphasize its influence upon the A-10's design. Its Vietnam War performance surprised many who thought it was an obsolete plane even in the Korea War. Painting by Gary Meyer; reproduction courtesy of DVIC.



AC-47 gunship. The AC-47 represented the Air Force's first attempt to use cargo planes for fire support in Vietnam. Photo courtesy of DVIC.



AC-130 gunship. It was first used in Vietnam, once the gunship concept caught on. It is still operational. Photo courtesy of DVIC.

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OV-10. Along with the A-37, this was another plane that offered brief potential for competition with the A-10. However, it did not compete with the A-10 because it had limited speed, durability, and load carriage capacity. Also, both it and the A-37's operational existence meant that the Air Force did not need another light counterinsurgency plane like the Enforcer. Photo courtesy of DVIC.



AV-8 Harrier. The Harrier is the Marine Corps VSTOL jet that many people preferred for Air Force use due to its ability to operate from short fields near the battle front. Photo courtesy of DVIC.



A-9. This was Northrop's entry in the CAS plane flyoff against the A-10. Photo courtesy of the National Archives.



Flight of two A-10s. They are carrying external fuel tanks for long-range deployment. Photo courtesy of DVIC.

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Single A-10. This one is carrying Mavericks (the white-colored missiles underwing) and maneuvering hard. Photo courtesy of the National Archives.

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The Enforcer. As one can see, it bore a strong resemblance to the P-51 that inspired its design. The nose is longer to accommodate the turboprop engine and there are tip tanks for more fuel. One can also see that the displayed weapons load, though impressive, still does not match the A-10's maximum weapons load. Further, a single turboprop airplane will have trouble gaining speed and maneuvering hard with the displayed weapons load. Had the A-37 and OV-10 not been in service, the Enforcer still might have been a good choice for a counterinsurgency plane. Photo from Congress, House, Enforcer Aircraft, 22 June 1978, 24.

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AH-64 Apache. This was the advanced attack helicopter design that finally succeeded in reaching operational status. It also became part of the A-10's competition in the 1980s. Many Army helicopter advocates still claim that this is the CAS aircraft of the future. Photo courtesy of DVIC.



F-16. Note the plane's petite hot rod appearance compared to the A-10. Photo courtesy of the National Archives.



Flight of three F-16s. Photo courtesy of DVIC.


Figure 47

Su-25 Frogfoot. Some Western observers thought this plane was the A-10's direct counterpart, but actually it was designed more for BAI-type missions. It was faster and smaller than the A-10. Even though this is a picture of the plane's underside, one can still see some similarities to the A-9, especially in engine placement. However, the Su-25's tail design distinctly differs from the A-9's sweeping "whale tail" setup. Photo courtesy of DVIC.

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## Figure 49

Mi-24 Hind. The Soviets' attack helicopter gained much Western defense press attention in the late 1970s and early 1980s. It was also the scourge of the skies over Afghanistan until the Afghan rebels started using Stinger SAMs. Photo courtesy DVIC.







IMAGE EVALUATION TEST TARGET (QA-3)







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