

ANTIAIRCRAFT ACTION SUMMARY

SUICIDE ATTACKS

APRIL 1945



**UNITED STATES FLEET
HEADQUARTERS OF THE COMMANDER IN CHIEF**

UNITED STATES FLEET
HEADQUARTERS OF THE COMMANDER IN CHIEF
NAVY DEPARTMENT
WASHINGTON 25, D. C.



30 April 1945

This publication deals with Japanese aerial suicide attacks against our surface forces in the Pacific, and covers the period from the invasion of Leyte in October 1944 to and including the invasion of Luzon at Lingayen Gulf in January 1945. It is published for the information and guidance of the Fleet.

This Antiaircraft Action Summary is SECRET and shall be safeguarded in accordance with the provisions of Article 76, U.S. Navy Regulations, 1920. When no longer required it shall be destroyed by burning. No report of destruction is required.

Transmission by Registered Guard Mail or U.S. registered mail is authorized in accordance with Article 76 (15) (e) and (f), U. S. Navy Regulations.

Although of primary interest to officers concerned with antiaircraft, it should be circulated widely among commissioned personnel.

C M Cooke Jr.

C. M. COOKE, Jr.,
Chief of Staff.

UNITED STATES FLEET
HEADQUARTERS OF THE COMMANDER IN CHIEF
NAVY DEPARTMENT
WASHINGTON 25, D. C.



DISTRIBUTION LIST FOR COMINCH SECRET BULLETIN P-009

Standard Navy Distribution List Part 1 - 15 March 1945

- List 1 a(2) less ComEighthFlt, ComTenthFlt, send CinCPac 10 copies; b(2); c(2) send ComAirForPac 5 copies; d(2); e(2); f(1) only to ComSubLant and ComSubForPac; g(2); h(2); i(2); j(2); k(2); l(2) only to Com Navy #815 and ComMinPac.
- List 2 b(2); c(1) less Airship A/S Tr. DetachmentLant; f(2); g(2); h(1); l(2); m(2) only to LCI(L), LSM, LST, LCS(L) (3) Flotillas; n(2) MinRons only; q(2); only to MTB FLOT 1, MTBRon SPac, MTERON PacFlt, MTBRON 7th Flt; w(2) send TransDivs (1).
- List 3 a(2); b(1); b-1(1); c(1) less Coast Guard; d(2); e(1); f(1); h(2); i(2); j(2); k(1); l(1); m(1); m-1(1); p(1); q(1); r(1) less Coast Guard; u(1); v-1(1); w(1); w-1(1); x(1); y(1); y-1(2) only to YMS Type Com PacFlt; aa(1); bb(1); dd(1); ff(1); ii(1); jj(1); kk(1); nn(1) only to PCE, PCE(R), PCS-less Coast Guard; pp(1); qq(1); rr(1); uu(1).

Standard Navy Distribution List Part 2 - 1 April 1945

- List 4 a(2); b(1); c(1); e(1); f(1); i(2); j(2); k(1); l(1); m(1); q(1); u(1); y(1) less YMS; bb(1); dd(1); ff(1); ii(1); kk(1); nn(1) PCE(R), PCE only; pp(1); qq(1); rr(1); uu(1).
- List 6 a(2) less 17th NavDisRep, SRNC, PRNC, SamDefGrp; c(1) Adm. & Mil. Com. San Diego, Calif only.
- List 7 a-1(2); c-1(2) only to NOB, Navy #115; f(5); g(30) USNA only; h(5); i-3(5).
- List 8 h(2) only to RESLAB Anacostia; n-1 only to NTSch (Tactical Radar) Hollywood, Fla (1); AATr.Cen, Lido Beach, Long Island, N.Y. (2); Naval Radar Tr. Sch. St. Simons Island, Ga. (1); Ordnance and Gunnery Schools, NYD, Wash., D.C. (2); FSS, NOB, Norfolk, Va. (2); FSS NAVREP-BASE, San Diego (2); n-10 only to Mine Craft Training Center and CIC Group Tr. Center, Little Creek, Norfolk, Va. (2); Fleet Gunnery & Torpedo School, Navy #91 (10); PacFltRadarCenter, Navy #91 (2); x(2).
- List 10 m(3) only to Ford Instrument Co., Long Island City, N.Y.; ss(2) only to FltAdminOff at NYD's.
- List 11 SecNav(1); UnderSecNav(1); AsstSecNavAir(1); GenBd(1); BuAero(2); BuPers(6); CNO(2); BuOrd(6); BuShips(6); BuY&D(2); USMC(10); USCG(10).

Plus Special Distribution List.

NOTE: Numbers in parenthesis indicate number of copies sent to each addressee.

TABLE OF CONTENTS

	Page
CHAPTER I INTRODUCTION	1-1
CHAPTER II OWN AND ENEMY SUCCESSES	2-1
CHAPTER III ENEMY TACTICS	3-1
CHAPTER IV AA. DEFENSE ORGANIZATION	4-1
CHAPTER V SUICIDE ATTACK SUMMARIES	5-1
CHAPTER VI NEW WEAPONS	6-1
CHAPTER VII COMMENTS AND RECOMMENDATIONS	7-1
CHAPTER VIII ANTI-SUICIDE TRAINING	8-1

LIST OF EFFECTIVE PAGES

	Page
Promulgating Letter - - - - -	I
Distribution List - - - - -	II
Table of Contents and List of Effective Pages - - - -	III
Chapter I - - - - -	1-1 to 1-7 incl.
Chapter II - - - - -	2-1 to 2-14 incl.
Chapter III - - - - -	3-1 to 3-8 incl.
Chapter IV - - - - -	4-1 to 4-11 incl.
Chapter V - - - - -	5-1 to 5-10 incl.
Chapter VI - - - - -	6-1 to 6-3 incl.
Chapter VII - - - - -	7-1 to 7-16 incl.
Chapter VIII - - - - -	8-1 to 8-6 incl.

CHAPTER I

INTRODUCTION

Beginning the latter part of October, 1944, the Japanese, desperate as a result of our threat to the Philippines, initiated an organized campaign of aerial suicide attacks against our surface forces.

Suicide attacks are not new to the fleet. Periodically since the beginning of the war fanatical Japanese pilots have deliberately crashed their planes into fleet units, although usually not until after their aircraft had suffered critical damage.

The development of suicide tactics to an intensive degree was to be expected. Piloting a Japanese aircraft was tantamount to being slated for certain death sooner or later as a victim of our aircraft or AA. fire. The psychological tendency of the Japanese toward self-sacrifice made logical the inauguration of aerial "banzai" raids against our shipping.

Standard bomb and torpedo attacks in all their forms have been attempted by the Japanese against our surface forces. These, as a result of highly-developed air and AA. defense, have proved both ineffective and costly to the enemy. At the same time our own aerial attrition of the Japanese fleet increased and our surface forces were threatening Japan's inner defenses. When the "Kamikaze" (Storm sent from Heaven) units began their operations the Japanese fleet had been defeated in the Battle for Leyte Gulf and U. S. forces were beginning the occupation of the Philippines.

Organization of "Kamikaze"

Intensive suicide attacks against our surface forces were planned some time before the first units were placed in action. It is believed that training of suicide pilots was initiated as early as last summer, and that 14 pilots were killed and 21 aircraft destroyed in early practice sessions directed at improving techniques. It is reported that in the pilot's pre-crash sensations "fainting is inevitable in such cases".

Early members of "Kamikaze" units are said to have been volunteers. They average in years from 19 to 24, and are more prevalent in the Navy than in the Army. Prisoners of war later reported that commanding officers "volunteered" whole squadrons. Finally, squadrons have been drafted. One recent report was to the effect that a pilot had been found with his feet manacled to the rudder controls, evidently to ensure that the "Kamikaze" phobia was retained. Women have been reported as being in training as suicide pilots.

There is no reason to believe that there will be a shortage of pilots as long as this form of attack proves profitable to the enemy. Training of such pilots should prove much simpler than the development of skilled fighter and bomber pilots, as their only objective is to evade interception and dive into ships.

ANTIAIRCRAFT ACTION SUMMARY

The Antiaircraft Problem

The suicide attack represents by far the most difficult antiaircraft problem yet faced by the fleet. The psychological value of AA., which in the past has driven away a large percentage of potential attackers, is inoperative against the suicide plane. If the plane is not shot down or so severely damaged that its control is impaired, it almost inevitably will hit its target. Expert aviation opinion agrees that an unhindered and undamaged plane has virtually a 100 percent chance of crashing a ship of any size regardless of her evasive action.

Time, study and intensive training are required by our surface forces to adjust themselves to each new type of attack, and there is no reason to believe that Fleet AA. will not make this type of attack, as it has others, unprofitable to the enemy. At the present time ships are destroying more than 50 percent of all attacking suicide planes, as compared with 33.6 percent success against dive and torpedo attacks during the first half of 1944.

(NOTE: In this summary an antiaircraft "kill" is a suicide plane which is destroyed or so deflected from its course that it misses its target. If it crashes into a ship it is not an AA. success, regardless of how badly damaged it may be.)

Suicide Vs Conventional Attacks

From the Japanese point of view, suicide attacks are a profitable tactic. Just how profitable they are is evident from a study of the relative efficiency of suicide attacks as compared with bombing and torpedo attacks, illustrated in the following tables:

TABLE I

Bombing And Torpedo Attacks

300 planes sortie
180 lost to CAP (60%)
120 attack ships
40 lost to AA. (33.3%)
12 get hits or damaging misses on ships (10%)
80 return to base
220 lost to CAP and AA. to score 12 hits.

TABLE II

Suicide Attacks

60 planes sortie
36 lost to CAP (60%)
24 attack ships
12 lost to AA. (50%)
12 get hits on ships (50%)
0 return to base
60 lost to score 12 hits.

INTRODUCTION

Thus it is seen that the enemy requires only one-fifth as many sorties to score a specific number of hits by suicide crashes as were needed in the standard forms of attack. At the same time the Japanese plane and pilot losses are only 27 percent as high as formerly.

Antiaircraft success, initially 50 percent against suicide attacks, may be expected to increase as gunnery and tactics improve. Likewise, air cover will improve. The extent of improvement required of CAP and AA., if the enemy's aerial efficiency is to be reduced to its former rate, is indicated in the following table:

TABLE III

Suicide Attacks

220 planes sortie
208 lost to CAP and AA. (95%)
12 get hits on ships (5%)
220 lost to score 12 hits.

In Table III enemy losses and successes are identical to those shown in Table I, but CAP and AA. performance has improved greatly. A theoretical division of the 208 planes shot down might be as follows:

172 lost to CAP (78%)
48 attack ships
36 lost to AA. (75%)

Air Cover

It will be seen that improvement of air cover will pay large dividends. It is presumed in Table II that CAP is intercepting and destroying the same percentage of suicide planes as it did other attack groups. Since suicide planes often are poorly armed and flown by inexperienced pilots, they make every effort to avoid contact with our fighters.

Considerable attention is being given air defense problems. They include air defense in depth, stacking of CAP, fighter direction and air discipline. The use of planes equipped with radar to assist in the detection of enemy planes has been proposed.

When ship-to-plane communications fail or are lacking, ships indicate the position of a bogey to CAP by firing a five-inch burst in its direction. The fighter complement on carriers has been increased in an effort to cope with the suicide attack threat.

Although most action reports have been complimentary toward the effectiveness of air cover in the Philippines, many have complained of its inadequacy. In some actions, chiefly at dusk and dawn, friendly aircraft were completely absent, leaving the entire defense problem to ships' guns.

ANTIAIRCRAFT ACTION SUMMARY

Since many attack groups in the past have been wiped out by our intercepting planes, it is believed that CAP will have no difficulty in achieving a score of 78 percent success or higher. Antiaircraft defense also will improve. This subject is discussed in detail in Chapter IV.

Other Anti-Suicide Factors

The seriousness of the situation imposed by suicide tactics requires no further elaboration. Chief interest of this bulletin is the antiaircraft aspects of the problem, but other requirements for the defeat of the suicider are of major importance, and bear listing in this discussion. They are:

1. Reduction of Japanese aircraft production through maximum bombing of such facilities on the Japanese mainland.
2. Attrition of enemy air power by:
 - (a) Interdiction bombing of enemy air fields.
 - (b) Immobilizing enemy air strips by use of "spikes" and "butterfly" bombs.
 - (c) Destroying planes on ground by strafing.
3. Tactical developments.
 - (a) Making every effort to gain and maintain air superiority in areas of naval operation.
 - (b) Providing maximum fighter cover over surface forces without dependence on detailed aid from FDO.
 - (c) Withdrawing valuable fire support ships as soon as they have completed their primary mission.
 - (d) Withdrawing CVE's as soon as use of air strips ashore has been gained.

Changes in Tactics

The Japanese have changed their tactics several times during the course of the war as a result of the improvement of the fleet's AA. and CAP and changes in the tactical situation. Beginning with the second year of the war, actions by the fleet against enemy planes are divided into four chronological groups, as follows:

1. January 1, 1943, to January 1, 1944. This period is characterized by simple, straightforward attacks by enemy aircraft. Usually only a few ships, often only a single ship, were under attack at one time. Enemy planes flew more or less direct courses and employed only a moderate amount of evasive tactics. There were many night attacks. The AA. on the whole was successful, and although some bombs and torpedoes struck ships the enemy's aircraft losses were high.
2. January 1, 1944, to June, 1944. During this period enemy aircraft were more cautious and used evasive tactics more frequently. They generally had to contend with AA. fire from several ships.

INTRODUCTION

Attacks were principally at night. The Japs were more wary in pressing home their attacks, and their losses dropped. On the other hand, few ships were struck and consequently the AA. defense was successful.

3. June 1, 1944, to October 1, 1944. This is the period when the fast carrier task forces conducted offensive strikes in the Central and South Pacific. Day attacks predominated, as the initiative did not rest with the Japanese and they could not choose their time for attack. Enemy aircraft were still more evasive than in Period 2, and there was considerable shooting at planes which remained at ranges greater than 9,000 yards without seriously attempting attacks. AA. defense for the period was highly successful.
4. October 1, 1944, to February 1, 1945. During this period the suicide attacks made their first appearance. The probability of shooting down a suicide plane was found to be relatively high. Unfortunately it is not high enough, and consequently the AA. defense against these aircraft cannot be considered satisfactory. Conventional torpedo and bombing attacks also were made during this period, and they followed the pattern of those in Period 3.

Evolution of Suicide Tactics

It is not unlikely that the enemy, appreciating the value of his suicide tactics, will develop them to the highest degree in succeeding months. A basic philosophy of the Japanese is that self-destruction is justified if in the process it means the elimination of a greater number of enemy personnel and a greater amount of enemy equipment. One of their basic motivations is that even so great a nation as the United States cannot long withstand such attrition.

What may the fleet expect in the future in the way of suicide tactics? Following are a few possibilities:

1. An especially-designed aircraft, cheap and easy to build, and made to last only one trip--that from its base to a U.S. Naval vessel.
2. A full load of high explosive or napalm instead of the light bombs now carried.
3. Jet or rocket propulsion to increase the hitting power of the plane.
4. Night attacks, with flares illuminating ships, and planes attacking in both dive and torpedo runs. If not suppressed, ships' tracers will provide pilots with a guide to the largest and most important targets, and with a point of aim. Once a ship is hit and burning, or a plane is set afire within a formation, the selection of other targets will be simplified for the enemy.

Jet Suicide Planes

First evidence that the enemy is leaving no stone unturned to develop suicide attacks of the greatest possible effectiveness appeared in mid-April when the Japanese began to employ jet-propelled flying bombs at Okinawa.

These bombs, similar in size and effectiveness to the robot bombs developed by the Germans, are launched from "mother" planes and controlled by Kamikaze pilots. They reportedly attain speeds of 450 to 500 knots before reaching their target. First reports indicate that the bombs have a wingspread of 15 feet, length of 20 feet, no engine or propeller.

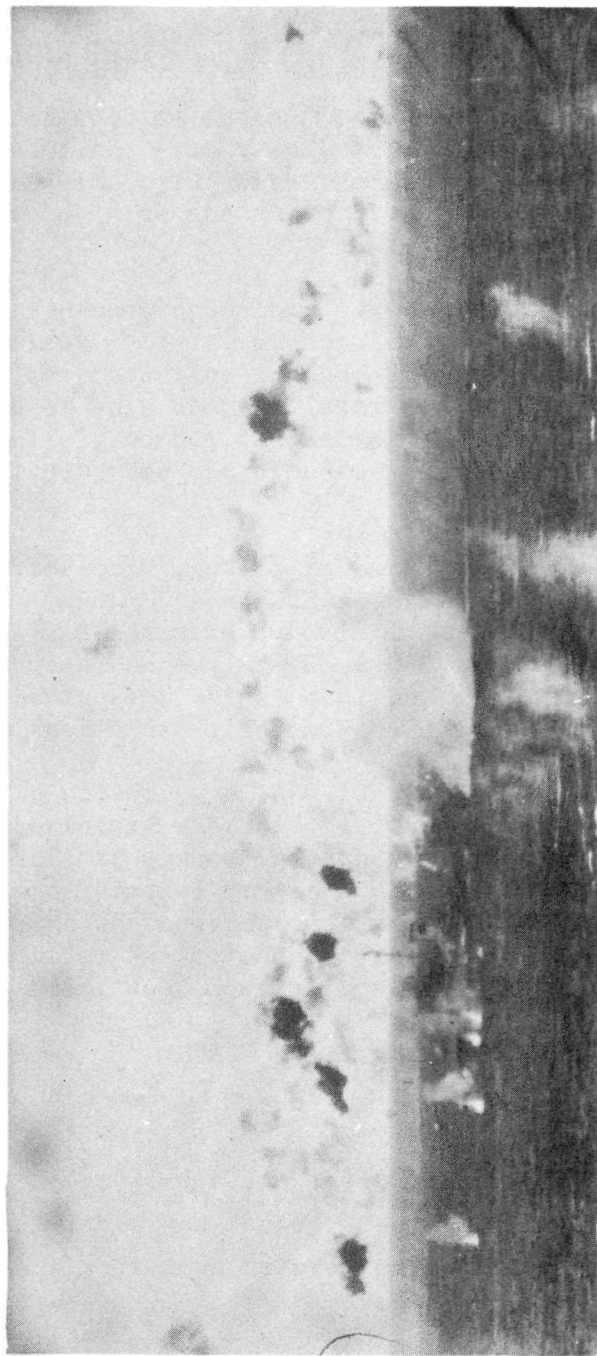
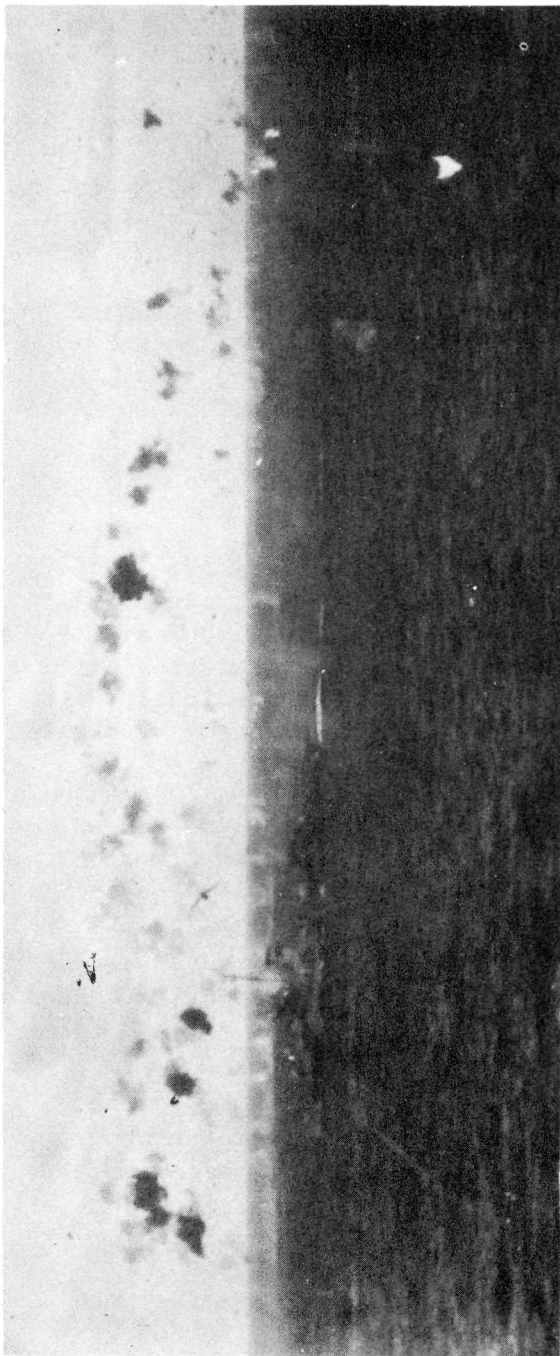
On 12 April the JEFFERS (DMS-27) underwent an attack by such a flying bomb which was released by a Helen at a range of 14,000 yards and an altitude of 4,000 feet. The bomb fell away slowly as the Helen made a steep bank away. Making a torpedo run on the ship the bomb accelerated rapidly, reaching 450 knots on a straight course until the final dip at the end.

The flying bomb, described as having a short, straight low wing, heavy round body, small tail and no undercarriage, was shot down 50 yards on the port beam after absorbing many 20mm. hits.

On 14 April, while on picket station, the STANLY (DD-478) was attacked by two flying bombs. The first was splashed and the second clipped the flag on the after stack and blew up in the water. Both made torpedo runs and were hit repeatedly by 40mm. fire. Parts of one pilot were recovered.

In all cases the jet bomb attacks have been coordinated with attacks by conventional planes. The M. L. ABELE (DD-733) splashed a Val with the aid of LSM-189. Two Zekes then attacked, one being shot down and the other hitting the ship with a bomb, breaking her keel. Immediately thereafter a flying bomb struck the starboard waterline at frame 115. The ship broke in two and sank immediately.

(NOTE: Heavy firepower, first at the launching plane and then at the bomb, using a high percentage of VT fuzes, is the best answer to this new weapon. Fire control should emphasize compensation for a rapidly accelerating target.)



Japanese suicide plane, under heavy fire, misses astern after turning on back to dive on DD of Task Group 77.4.2 during Lingayen operation.

CHAPTER II

OWN AND ENEMY SUCCESSES

Sufficient reports have been received of suicide actions between 1 October 1944 and 31 January 1945 to permit analysis of the extent and seriousness of the new enemy tactics, and of our own success in coping with them. These reports are not complete, but represent a sample large enough to give an accurate picture of results during this period.

Unfortunately a plane's intentions on approaching within gun range, when it becomes an AA. problem, are not always clear. If it is shot down at long range its intentions are never revealed. The statistics on the suicide problem presented in Tables I and II at the end of this chapter, accordingly, are restricted to only those planes which definitely commit themselves to suicide attacks. They reveal AA. performance under surprise and close-range conditions only.

Suicide attacks by no means represent the only tactics in current use by Japanese aircraft. From 1 October through January, when 312 suicide crash attempts were made, some 1,132 planes which did not make suicide attacks menaced our surface forces, i.e., approached within gun range. Of these 936 either made conventional attacks or withdrew in the face of ships' gunfire, and obviously were not suiciders since they neither crash dived nor were shot down.

The remaining 196 fall in an indefinite category. Since they were shot down it cannot be said with any degree of certainty whether or not they intended to commit suicide. It seems reasonable to assume that the same proportion of these 196 intended to suicide as is determined from the known cases, and that AA. performance had equal success against conventional and suicide attackers. Thus 24 percent of the total sorties which reached within ships' gun range were suicide attackers, and 76 percent used conventional attacks or harassing tactics.

Summarizing, analysis of AA. actions shows:

- 1444 suicide and non-suicide planes were taken under fire.

- 352 suicide planes approached within gun range.

- 40 or 11 percent of these were shot down before committing themselves to a crash attempt.

- 312 suicide attempts actually were made on ships.

- 191 or 61 percent were shot down or deflected, but of these

- 53 or 17 percent, crashed close enough to ships to damage them.

- 1092 non-suicide planes were taken under fire.

- 156, or 14 percent, were shot down.

- 23, or 1.2 percent, scored hits on ships.

ANTIAIRCRAFT ACTION SUMMARY

Following is a box score showing results by months:

	<u>Oct.</u>	<u>Nov.</u>	<u>Dec.</u>	<u>Jan.</u>	<u>TOTALS</u>
Total planes	510	282	320	332	1444
Suicide planes	54	79	109	110	352
Non-suicide planes	456	203	211	222	1092
Suicide kills	36	51	76	68	231
Non-suicide kills	95	16	23	22	156
Suicide hits	18	28	33	42	121
Non-suicide hits	10	1	3	9	23

Successes By Ships Types

Battleships have been more successful in protecting themselves from damage by suicide planes than any other type of ship, as is indicated in Table II. This is unquestionably due to the greater firepower of these ships, better distribution of guns and less distraction from the AA. problem.

The very low success of merchant ships indicates that defense in the late stages of a suicide attack must be borne primarily by the target ship. It also demonstrates that a suicide pilot, unless opposed by very heavy AA. fire, has virtually a certainty of hitting his target.

Carriers, especially CV's have been more susceptible to damage than any other types of naval vessels. Two of every three planes attacking managed to score a hit or damaging near miss on one of these ships. Always the primary target of suicide planes, CV's present a target so large that an attacking plane is almost certain to hit unless it suffers severe structural damage. CVE's, comparatively slow and lacking the fire power of their larger sisters, have nevertheless given a creditable performance.

Table II includes merchant ships and Australian ships. Suicide planes attacking these ships were taken under fire by U.S. Naval Vessels, and they also assisted in the destruction of enemy aircraft. For the purpose of determining our own and the enemy's successes, therefore, these ships are included with U.S. Naval vessels.

Table III is a list of ships hit and damaged by near misses, classified according to ship type. It shows that 19 ships were sunk, including two CVE's, three DD's, one APD, one ATO, one DMS, one LCI, two LSM's, four LST's, one SC and three merchant vessels.

Several ships have been hit by more than one plane. The HMAS AUSTRALIA, for example, was hit five times, the INTREPID (CV-11) and MAHAN (DD-364) by three each. Seven other ships were hit by two planes.

Table IV is a supplementary list of ships sunk or damaged by suicide planes.

OWN AND ENEMY SUCCESSES

Data on these ships were not sufficiently adequate to warrant inclusion in Tables I, II, and III. The table shows that four planes hit the SARATOGA (CV-3) off Iwo Jima on 21 February. Two PT's are listed as sunk.

Ammunition Performance

Tables V and VI give data on ammunition fired in suicide and non-suicide actions, respectively during the period of 1 October through January. Statistics include figures on rounds expended, planes shot down by various calibers, and rounds-per-bird by caliber.

Two features stand out in these tables:

1. The success of the automatic weapons.
2. The poor performance of 5-inch batteries, especially during suicide attacks.

Credit for approximately 80 percent of all plane kills in suicide actions goes to the automatic weapons (50 percent to 40mm. and 27 percent to 20mm.), leaving 20 percent to 5-inch batteries, which fired disappointingly small quantities of ammunition at the many targets presented.

Against planes in non-suicide actions the 5-inch weapons were more successful, getting credit for 34% of all kills.

Approximately the same proportion of VT fuzes (27% of 5-inch projectiles) was used against both types of attacks. In the case of the suicide planes, VT fuzes score 56 percent of all 5-inch kills, and in the case of non-suicide planes they scored 37 percent of such kills.

The poor performance of 5-inch batteries, exclusive of fire control considerations, may be credited to:

1. Small 5-inch expenditures, especially during suicide attacks, a result of failure to open fire at maximum range.
2. Failure to use a sufficient proportion of VT fuzes.

Because the suicide attack presents a close-in AA. problem, the preponderance of automatic weapon successes was to be expected.

The fact that 5-inch performance in non-suicide attacks was reasonably good is a result of the expenditure of large quantities of ammunition, much of it at long range. Since a high percentage of planes was prevented from reaching attack position the higher RPB is not to be deplored.

The importance of destroying the highest possible percentage of planes by 5-inch fire is apparent when it is considered that of the suicide planes shot

ANTIAIRCRAFT ACTION SUMMARY

down all but a few crashed dangerously close to ships. In contrast to the effect of automatic weapons, that of 5-inch bursts is to cause a plane to crash at a safe range from the ships firing.

Although many ships have criticized the 20mm. as a defensive weapon against suicide planes, Tables V and VI indicate that it still is an effective AA. weapon both against suicide and non-suicide attacks. However, the 40mm. was by far the most effective weapon against suicide planes.

Five-inch battery problems are discussed in Chapter IV.

TABLE I

<u>Month</u>	<u>Suicide Attempts</u>	<u>Suicide Hits</u>	<u>Damaging Near Misses</u>	<u>Suicides Shot Down Clear</u>	<u>% Misses Due to AA.</u>	<u>% Hits</u>	<u>% Damaging Near Misses</u>
Oct.	43	18	7	18	58	42	16
Nov.	73	28	11	34	62	38	26
Dec.	97	33	13	51	66	34	13
Jan.	99	42	22	35	58	42	22
TOTALS	312	121	53	138	61	39	17

TABLE II

Ship Type

BB	12	5	0	7	58	42	0
CA-CL	34	13	6	15	62	38	18
CV	17	9	1	7	47	53	6
CVL	5	2	1	2	60	40	20
CVE	30	12	8	10	60	40	27
DD	75	22	13	40	70	30	17
SMALLER SHIPS	107	37	19	51	65	35	18
MERCHANT SHIPS	32	21	5	6	34	66	16

TABLE III

SHIPS SUNK OR DAMAGED BY SUICIDE PLANES

13 October 1944 - 31 January 1945

H = Hit

D = Damaging Near Miss

Each Letter Represents One Suicide Plane

Dates Given are for Zone Time

BB

California
Colorado

BB-44
BB-45

H
H

6 Jan.
27 Nov.

OWN AND ENEMY SUCCESSES

Maryland	BB-46	H	29 Nov.
New Mexico	BB-40	H	6 Jan.
Mississippi	BB-41	H	9 Jan.
<u>CA</u>			
HMAS Australia		H	21 Oct.
"		H	5 Jan.
"		H	6 Jan.
"		D	8 Jan.
"		H	9 Jan.
Louisville	CA-28	H	5 Jan.
"	"	H	6 Jan.
Minneapolis	CA-36	D	6 Jan.
HMAS Shropshire		H	5 Jan.
<u>CL</u>			
Reno	CL-96	H	14 Oct.
Denver	CL-58	D	28 Oct.
Montpelier	CL-57	D	27 Nov.
St. Louis	CL-49	HD	27 Nov.
Nashville	CL-43	H	13 Dec.
Columbia	CL-56	HD	6 Jan.
"	"	H	9 Jan.
<u>CV</u>			
Franklin	CV-13	H	13 Oct.
"	"	H	30 Oct.
Intrepid	CV-11	H	29 Oct.
"	"	HH	25 Nov.
Lexington	CV-16	H	5 Nov.
Hancock	CV-19	D	25 Nov.
Essex	CV-9	H	25 Nov.
Ticonderoga	CV-14	HH	21 Jan.
<u>CVL</u>			
Bellau Wood	CVL-24	H	30 Oct.
Cabot	CVL-28	HD	25 Nov.
<u>CVE</u>			
Fanshaw Bay	CVE-70	D	25 Oct.
Kalinin Bay	CVE-68	HH	25 Oct.
Kitkun Bay	CVE-71	HD	25 Oct.
"	"	H	8 Jan.
Sangamon	CVE-26	D	25 Oct.
Santee	CVE-29	H	25 Oct.
St. Lo	CVE-63	H (Sunk)	25 Oct.
Suwannee	CVE-27	H	25 Oct.
"	"	H	26 Oct.
White Plains	CVE-66	D	25 Oct.
Marcus Island	CVE-77	DD	15 Dec.
Ommaney Bay	CVE-79	H (Sunk)	4 Jan.

ANTIAIRCRAFT ACTION SUMMARY

Manila Bay	CVE-61	HD	5 Jan.
Savo Island	CVE-78	D	5 Jan.
Kadashan Bay	CVE-76	H	8 Jan.
Salamaua	CVE-96	H	13 Jan.
<u>DD</u>			
Claxton	DD-571	D	1 Nov.
Ammen	DD-527	H	1 Nov.
Abner Read	DD-526	H (Sunk)	1 Nov.
Anderson	DD-411	H	1 Nov.
Richard P. Leary	DD-664	D	6 Jan.
Ross	DD-563	D	27 Nov.
Aulick	DD-569	HD	29 Nov.
Saufley	DD-465	HD	29 Nov.
Drayton	DD-366	H	5 Dec.
Mugford	DD-389	H	5 Dec.
Mahan	DD-364	HHH (Sunk)	7 Dec.
Lamson	DD-367	H	7 Dec.
Hughes	DD-410	H	10 Dec.
Reid	DD-369	HD (Sunk)	11 Dec.
Caldwell	DD-605	D	11 Dec.
"	"	H	12 Dec.
Haraden	DD-585	H	13 Dec.
Howorth	DD-592	DD	15 Dec.
Bryant	DD-665	D	22 Dec.
Pringle	DD-477	H	30 Dec.
Gansevoort	DD-608	H	30 Dec.
HMAS Arunta	----	H	5 Jan.
Allen M. Summer	DD-692	H	6 Jan.
Walke	DD-723	H	6 Jan.
O'Brien	DD-725	H	6 Jan.
Bush	DD-529	D	9 Jan.
Newcomb	DD-586	D	6 Jan.
Helm	DD-388	D	5 Jan.
Maddox	DD-731	H	21 Jan.
<u>AGP</u>			
Orestes	AGP-10	H	30 Dec.
<u>AO</u>			
Cowanesque	AO-79	H	3 Jan.
<u>APA</u>			
Alpine	APA-92	H	18 Nov.
James O'Hara	APA-90	D	24 Nov.
Callaway	APA-35	H	8 Jan.
HMAS Westralia	LSI (L)	D	8 Jan.
DuPage	APA-41	H	10 Jan.
Zeilin	APA-3	H	13 Jan.

OWN AND ENEMY SUCCESSES

APD

Ward	APD-16	H (Sunk)	7 Dec.
Liddle	APD-60	H	7 Dec.
Brooks	APD-10	H	6 Jan.
Belknap	APD-34	H	12 Jan.

ARD

ARD-19		H	27 Nov.
--------	--	---	---------

ARL

Achilles	ARL-41	H	12 Nov.
----------	--------	---	---------

ATF

Apache	ATF-67	H	6 Jan.
--------	--------	---	--------

ATO

Sonoma	ATO-12	D (Sunk)	24 Oct.
--------	--------	----------	---------

AVP

Orca	AVP-49	H	6 Jan.
------	--------	---	--------

DE

Stafford	DE-411	H	5 Jan.
Hodges	DE-231	D	9 Jan.
LeRay Wilson	DE-414	H	10 Jan.
Gilligan	DE-508	H	12 Jan.
Richard W. Suesens	DE-342	H	12 Jan.

DMS

Long	DMS-12	HH (Sunk)	6 Jan.
Southard	DMS-10	H	6 Jan.

IX

Porcupine	IX-126	H	30 Dec.
-----------	--------	---	---------

LCI

LCI-65		H	24 Oct.
LCI-1065		H (Sunk)	24 Oct.
LCI-1075		H	10 Dec.
LCI-70		H	5 Jan.

LSM

LSM-20		H (Sunk)	5 Dec.
LSM-23		H	5 Dec.
LSM-318		H (Sunk)	7 Dec.
LSM-18		D	7 Dec.

LST

LST-693		D	26 Oct.
LST-66		H	12 Nov.

ANTIAIRCRAFT ACTION SUMMARY

LST-737	H	7 Dec.
LST-909	D	15 Dec.
LST-670	D	15 Dec.
LST-472	H (Sunk)	15 Dec.
LST-738	H (Sunk)	15 Dec.
LST-460	H (Sunk)	21 Dec.
LST-749	H (Sunk)	21 Dec.
LST-1014	D	21 Dec.
LST-205	D	29 Dec.
LST-912	H	8 Jan.
LST 700	D	12 Jan.
LST-700	H	13 Jan.
LST 268	D	12 Jan.
LST 579	D	12 Jan.

SC

SC-744	H (Sunk)	27 Nov.
--------	----------	---------

Y

Y-14	D	16 Dec.
------	---	---------

YMS

YMS 53	D	6 Jan.
YMS 340	D	12 Jan.

Merchant Ships

Augustus Thomas		H	24 Oct.
Benjamin Wheeler		H	27 Oct.
Matthew P. Deady		H	3 Nov.
Jeremiah Daily		H	12 Nov.
Leonidas Merritt		HH	12 Nov.
Morrison Waite		H	12 Nov.
Thomas Nelson		H	12 Nov.
Alexander Majors		H	12 Nov.
William A. Coulter		DH	12 Nov.
Gilbert Stuart		H	18 Nov.
Alcoa Pioneer		H	19 Nov.
Cape Romano		D	19 Nov.
Marcus Daly		H	5 Dec.
" "		H	10 Dec.
William S. Ladd	7176 Gr. Tons	H (Sunk)	10 Dec.
Juan De Fuca		H	21 Dec.
William Sharon		H	28 Dec.
John S. Burke	7180 Gr. Tons	H (Sunk)	28 Dec.
Lewis L. Dyche	7176 Gr. Tons	H (Sunk)	4 Jan.
Otis Skinner		H	12 Jan.
Kyle Johnson		H	12 Jan.
Edw. N. Westcott		D	12 Jan.
D.D. Field		D	12 Jan.
Elmira Victory		D	12 Jan.

OWN AND ENEMY SUCCESSES

TABLE IV SHIPS SUNK OR DAMAGED BY SUICIDE PLANES

SUPPLEMENTARY LIST

Details are not yet available for the following attacks and they are not included in Tables 1, 2 or 3.

<u>CV</u>				
Saratoga	CV-3	HHHH		21 Feb.
<u>CVE</u>				
Saginaw Bay	CVE-82	H		21 Feb.
Lunga Point	CVE-94	H		21 Feb.
Bismarck Sea	CVE-95	HH (Sunk)		21 Feb.
<u>AKN</u>				
Keokuk	AKN-4	H		21 Feb.
<u>PT</u>				
PT-323		(Total Loss)		11 Dec.
PT-300		(Sunk)		18 Dec.

ANTIAIRCRAFT ACTION SUMMARY

TABLE V

AMMUNITION PERFORMANCE IN SUICIDE ACTIONS

(1 October - 31 January)

AMMUNITION EXPENDED

	5" Com.	5" VT	3"/50	40mm.	1.1	20mm.	50 Cal.
October	2,218	1,575	88	51,729	-	109,813	8,193
November	6,064	1,942	392	65,025	61	113,814	14,704
December	4,440	870	194	33,235	-	92,433	12,471
January	9,363	3,216	3,943	109,068	2,170	244,693	34,804
TOTALS	22,085	7,603	4,617	259,057	2,231	560,753	70,172

PLANES DESTROYED - BY AMMUNITION TYPES

October	1.5	6.5	1.5	23.5	-	11.0	-
November	5.0	6.0	1.0	27.0	-	13.0	-
December	9.0	4.0	-	33.0	-	23.5	.5
January	3.5	8.0	4.0	30.5	1.0	15.0	2.0
TOTALS	19.0 (8%)	24.5 (11%)	6.5 (3%)	114.0 (50%)	1.0 (0%)	62.5 (27%)	2.5 (1%)

ROUNDS PER BIRD - BY AMMUNITION TYPES

October	1,479	242	59	2,201	-	9,983	-
November	1,213	324	392	2,408	-	8,755	-
December	493	218	-	1,007	-	3,933	24,942
January	2,675	402	986	3,576	2,170	16,313	17,402
AVERAGE	1,162	310	710	2,272	2,231	8,972	28,069

(NOTE: This table provides data for actions in which at least one suicide crash was attempted, but some kills were planes not definitely identified as having suicidal intentions.)

OWN AND ENEMY SUCCESSES

TABLE VI

AMMUNITION PERFORMANCE IN NON-SUICIDE ACTIONS

(1 October - 31 January)

AMMUNITION EXPENDED

	5" Com.	5" VT	3"/50	40mm.	1.1	20mm.	.50 Cal.
October	17,213	7,265	1,176	84,449	2,278	210,660	19,993
November	3,902	798	216	7,496	693	17,359	875
December	3,975	1,164	251	20,431	-	53,834	9,655
January	7,058	3,249	1,367	42,251	1,793	79,347	14,893
TOTALS	32,148	12,476	3,010	154,627	4,764	361,200	45,416

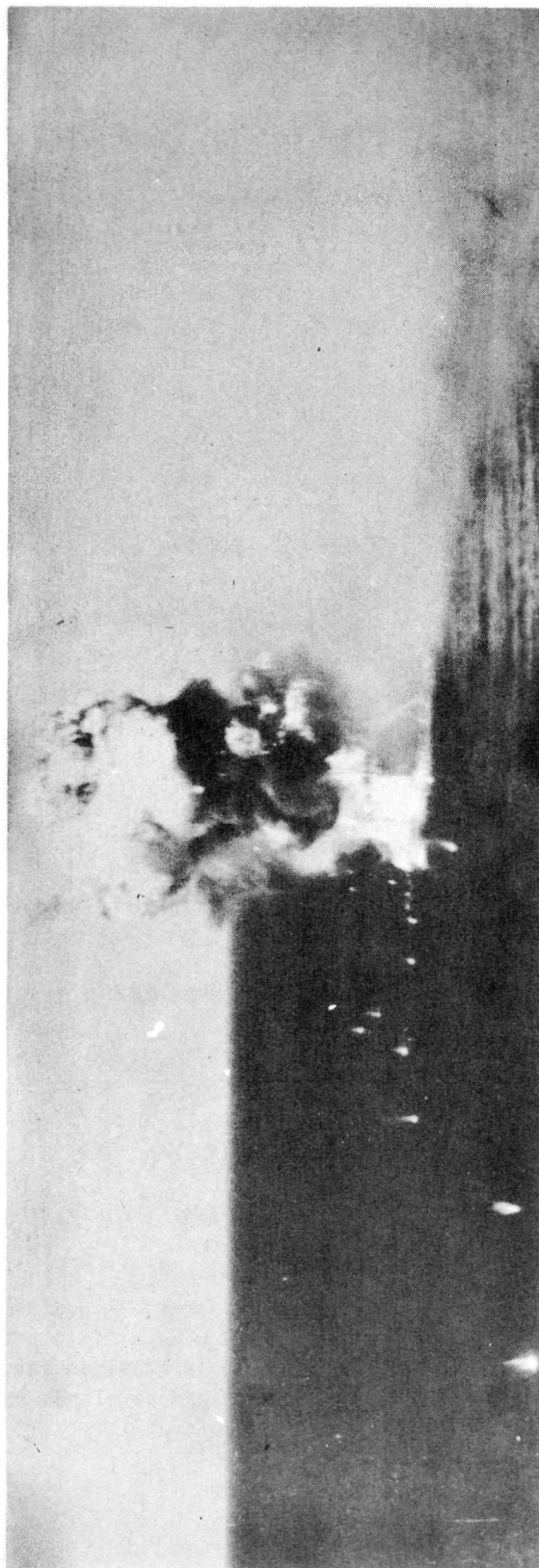
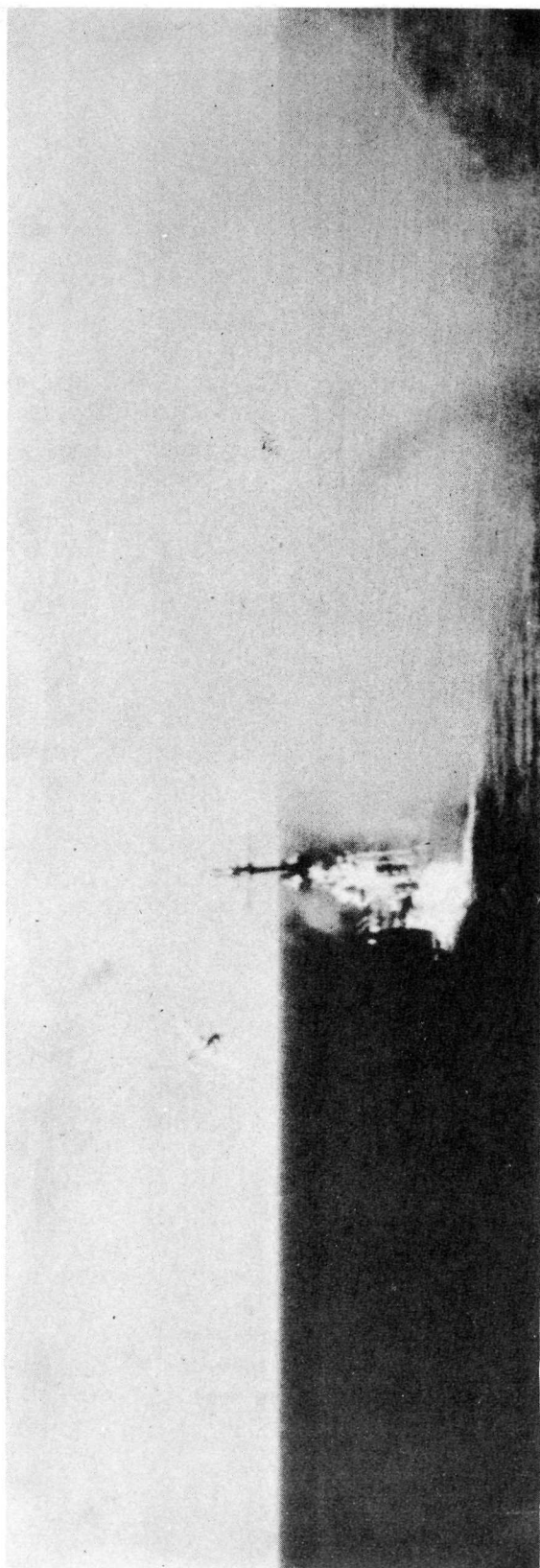
PLANES DESTROYED - BY AMMUNITION TYPES

October	23.0	9.5	4.0	23.0	-	27.0	.5
November	1.5	1.0	-	6.5	-	5.5	1.0
December	5.0	6.5	-	9.5	-	8.0	-
January	4.0	3.0	-	7.5	-	10.0	1.5
TOTALS	33.5 (21%)	20.0 (13%)	4.0 (3%)	46.0 (29%)	-	50.5 (32%)	3.0 (2%)

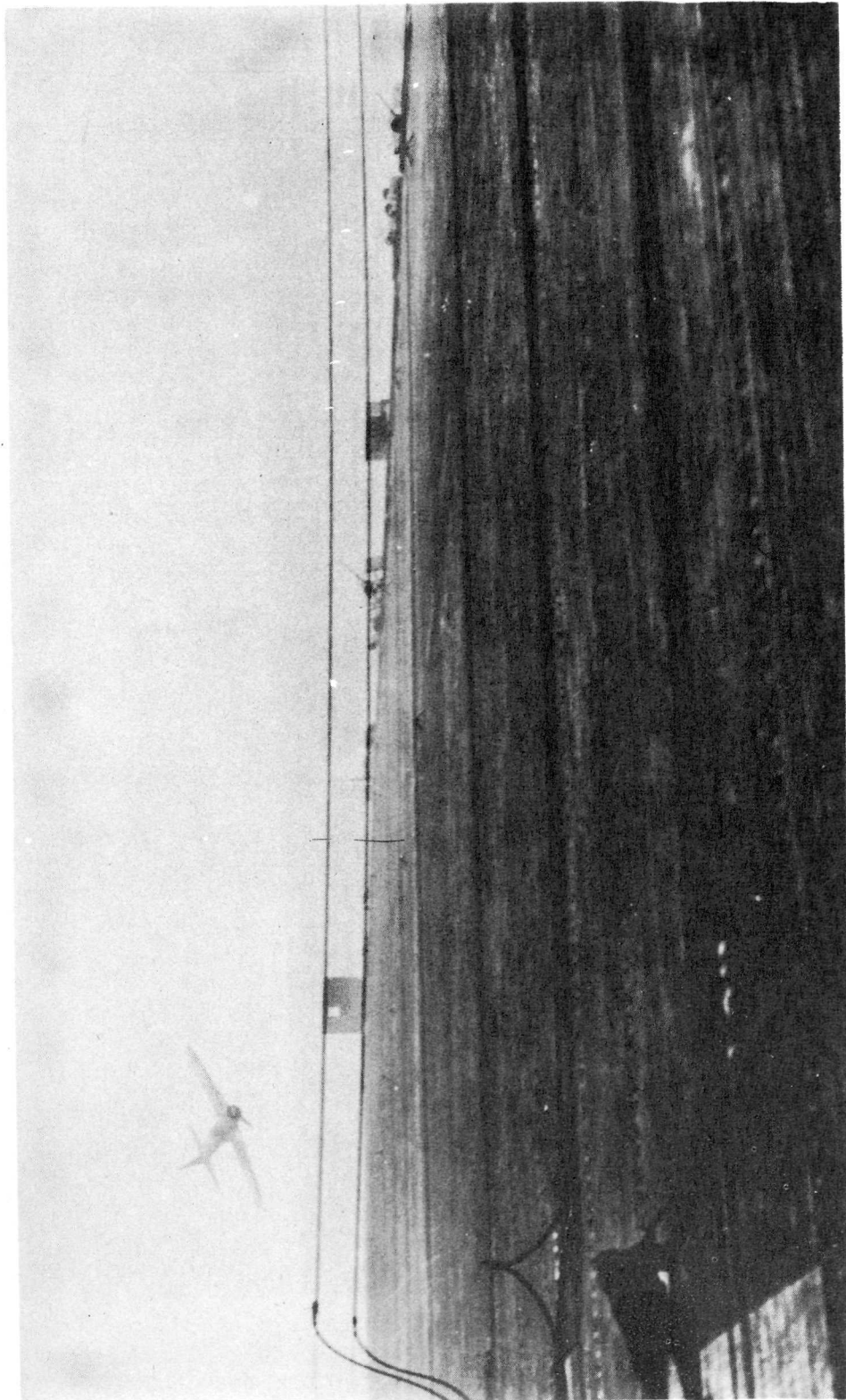
ROUNDS PER BIRD - BY AMMUNITION TYPES

October	748	65	294	3,672	-	7,802	39,986
November	2,601	798	-	1,249	-	3,156	875
December	795	179	-	2,151	-	6,729	-
January	1,765	1,083	-	5,633	-	7,935	9,929
AVERAGE	960	624	752	3,361	-	7,152	15,139

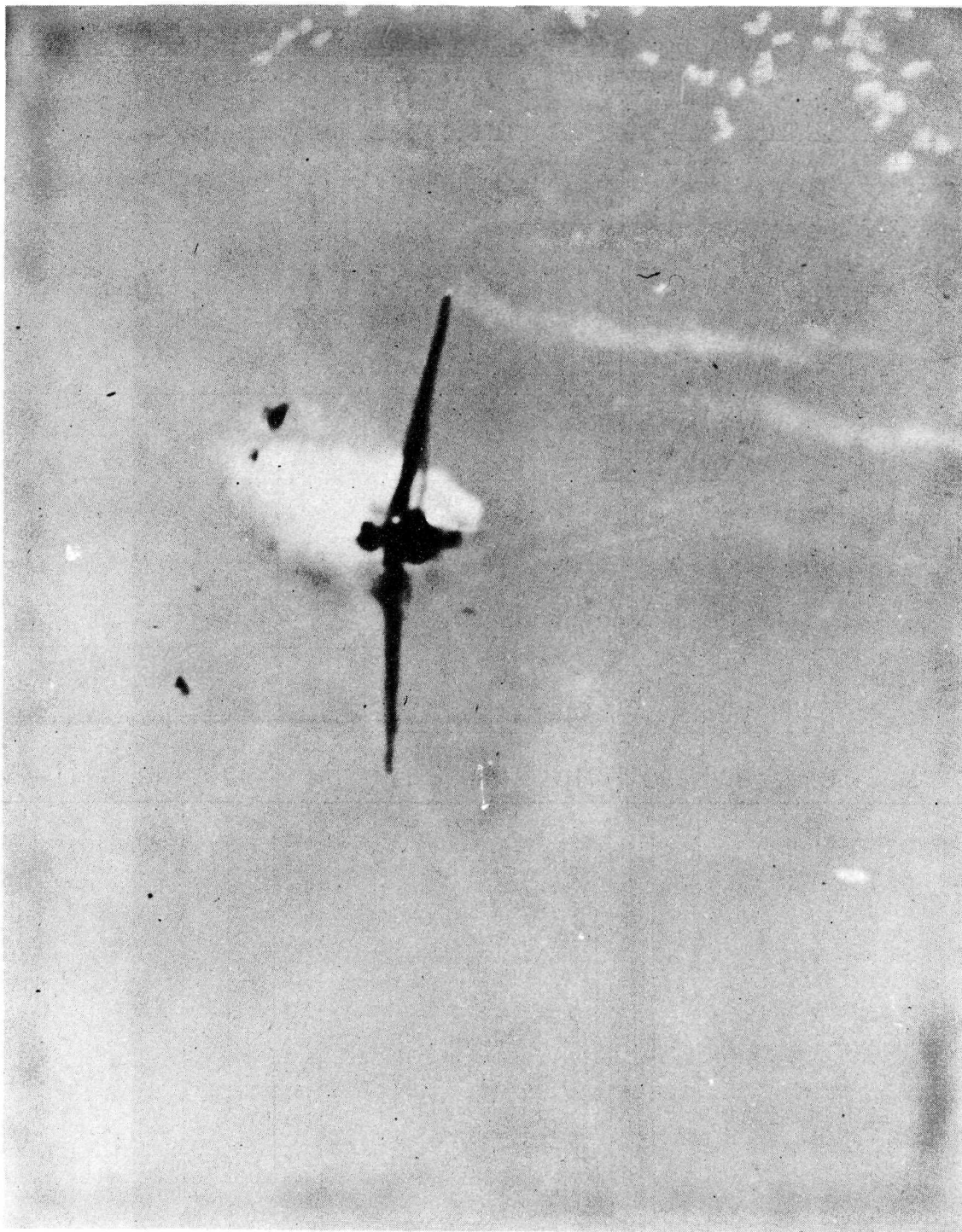
(NOTE: This table provides data for actions in which no suicide dives were made and no planes shot down were identified as bent upon crashing ships.)



The COLUMBIA (CL-56), just before and after being hit by Zeke on 6 January as seen from the PORTLAND (CA-33).



Last phase of suicide attack of the WHITE PLAINS (CVE-66) on 25 October.
Zeke misses 50 - 100 feet astern.



Power glide carried this suicide Zeke, afire and badly damaged, into the NEW MEXICO (BB-40) at Lingayen on 6 January.

CHAPTER III

ENEMY TACTICS

It is difficult to describe a "typical" suicide attack. No two are exactly alike, the only thing each has in common being either the plane's crash into a ship or its "splash" as a result of AA. or interception by friendly fighters.

To analyze enemy suicide tactics, attacks, as described in action reports, are given here in their various component parts:

The Approach

The approach of suicide planes is characterized by tactics designed to take advantage of the weaknesses of our search radar equipment. These tactics are in general as follows:

1. Flying at altitudes exceeding 20,000 feet to make best use of radar null areas, or flying very low over water to avoid early detection.
2. Making a series of dives and climbs, rarely flying a straight course when within 40 miles of the target ships.
3. Approaching from over the nearest land. Nearly all approaches except those against fast carrier task groups have been of this nature.
4. Trailing in the shadow of the IFF of friendly planes returning to their bases.
5. Using a variety of IFF of their own.
6. Approaching in small groups from different bearings and at different altitudes to increase the radar interception problem.

Besides avoiding radar, suicide planes make every effort to evade CAP. They use independent evasive tactics, employing cloud cover whenever possible and making every effort to fly over or under friendly fighter patrols.

It is believed that suicide planes are accompanied by radar-equipped control planes, which vector the suicide pilots to our ships from a long range.

When the high altitude approach is used, suicide pilots select their targets from a long range, and show no hesitancy in making the attack after reaching the push-over point.

Maximum speed is employed frequently by suicide pilots, using a power glide from long distances when approaching at high altitudes; however, instances are on record where dive flaps have been used to restrict speed and increase accuracy.

ANTIAIRCRAFT ACTION SUMMARY

ALTITUDE OF APPROACH

	<u>ABOVE CLOUDS</u>	<u>MEDIUM</u>	<u>VERY LOW</u>
Oct. - Nov.	87%	0	13%
Dec.	10%	30%	60%
Jan.	32%	8%	60%

The Attack

Tactics used during the actual suicide attack apparently are designed to make the fire control problem as difficult as possible. The tactics include:

1. Groups of suicide planes split up for their attacks after reaching maximum 5-inch gun range.
2. Attacks are made from out of clouds and from out of the sun to effect surprise and avoid gunfire until the last possible moment.
3. The enemy makes his attack as quickly as possible after getting in position over the formation, giving little time for AA. tracking.
4. Extensive use of decoys is made, with one plane appearing out of a cloud to draw AA. fire while another attacks from a low angle, and vice versa.
5. When the low angle approach is used the plane weaves close to the water, crashing into the hulls of small ships and zooming upward, making a vertical turn and diving on the topside of larger ships from the opposite direction from the original approach.
6. Sharp reversals of direction and constant acceleration in dives are used at close range.
7. When harassed by AA. fire suicide planes usually maneuver radically, sometimes employing "flipper" turns, "wingovers" and other aerobatics during the final phase of the attack.

Most dives have been made in angles from 20 to 45 degrees, although extremes of attack angles have been 0 and 75 degrees.

Most attacks have been made out of clouds, from altitudes of 3,000 to 6,000 feet, and from ranges of 4,000 to 6,000 yards. The ratio of dive and glide attacks to torpedo-type attacks has been 1:1, despite the fact that the trend has been toward the low angle attack.

ENEMY TACTICS

Suicide planes usually carry their bombs into the ship (or water), but on several occasions they have dropped their bombs on one ship and gone on to make a suicide attack on another. Also planes have made attacks without carrying bombs, evidently having dropped them at shipping in another area.

USE OF BOMBS

	<u>CARRIED THROUGH TO CRASH</u>	<u>RELEASED PRIOR TO CRASH</u>
Oct. - Nov.	60%	40%
Dec.	84%	16%
Jan.	88%	12%

Planes occasionally coordinate their attacks. On one occasion nine Bettys attacked a DD in succession, and there is evidence of planes pairing up against carriers.

Strafing during attacks has been common, but comparatively small damage has been caused by strafing alone.

Often one of the group of suicide planes remains out of gun range, as if to observe, and perhaps photograph, the results of the attack.

Suicide Planes

Virtually every type of aircraft except the four-engined search plane has been used by the enemy in suicide attacks.

Zekes, Oscars and other fast, maneuverable fighter-bombers are preferred, but dive bombers and even torpedo bombers, such as the Jill and even twin-engined Bettys and Frans have been employed.

The ratio of single-engined planes to twin-engined planes used in suicide attacks has been 6:1.

TYPE OF PLANE

	<u>SINGLE ENGINED</u>	<u>TWIN ENGINED</u>
Oct. Nov.	87%	13%
Dec.	82%	18%
Jan.	88%	12%

There is no method of distinguishing suicide planes from others until they are in the final phase of their attack.

ANTIAIRCRAFT ACTION SUMMARY

Standard armament of suicide fighter-bombers appears to be one bomb of 250 kg. under each wing. Bombs are armed without being released, and detonate upon contact.

Many reports indicate that planes burst into flames just prior to crashing into ships. A prisoner of war has indicated that wings of suicide planes are so prepared that they could be ignited by the pilot. There is no concrete evidence, however, to indicate that the fire is caused by any source other than antiaircraft fire.

Early reports also indicated that suicide planes carried only sufficient gasoline to carry them to their destination. Considering the fact that some suicide planes have belly tanks, and the size of fires resulting after crashes into ships, it is believed that these planes carry a full load of gas.

IFF indications from enemy planes that resemble Mark III Code 1, 2 or 3 have been reported.

There are some indications of special rigging, such as half-inch armor plate, to decrease the vulnerability of the plane to AA. fire.

A prisoner of war reported: "Wooden suicide planes are being manufactured with a speed of 410 knots and a ceiling of 18,200 feet. They will carry dynamite, equipped with an electric fuze, and also will be capable of carrying one bomb. The purpose of the plane is to sink one ship at the expense of one such plane."

Types of Ships Attacked

Suicide planes have attacked virtually every type of ship, from PT boat, merchant vessel and LSM to battleships and carriers.

Whenever a carrier is in the formation it is singled out for attack. The Japs often follow air strikes back to base, and attack when the carrier is headed into the wind to receive or launch planes.

When a carrier is not present suicide pilots direct their attacks against the largest ships in the immediate area.

In attacking convoys suicide planes concentrate on the destroyer screen, but do not hesitate to crash into amphibious ships on occasion.

If badly damaged by anti-aircraft fire, or if under attack by friendly fighters, the enemy selects targets of opportunity, attacking the nearest surface ship in the vicinity.

Pickets or patrol vessels which lack fighter cover or assisting AA. fire from other ships, are likely to be attacked with determination.

A ship, once hit, is likely to be singled out for attack by other planes, seeking to finish off a target whose defense has been impaired.

ENEMY TACTICS

Point of Aim

In attacking aircraft carriers suicide pilots aim for planes spotted on the flight deck, seeking thereby to increase the size and intensity of the fire resulting from the fuel carried by their own and the carriers' planes.

When there are no planes on the flight deck the enemy attempts to crash into the island superstructure, or possibly the elevators.

The bridge, and superstructure aft, are favorite points of aim on battleships, cruisers, destroyers and other ships.

The hull is used as a point of aim in attacks against small and lightly-armored ships.

Because of damage by AA. and because of ship's speed and maneuvers, however, suicide planes have not always been able to hit the more vulnerable parts of their targets. Ships have been hit on their catwalks, gun tubs, hulls on the side and stern, and at various points topside.

Suicide Attack Doctrine

Two Japanese documents captured on Negros Island present a doctrine for pilots of the "Special Attack Unit". One contains training and the other tactical instructions.

Appreciating that a lull exists between carrier deck load strikes, the enemy has planned to take advantage of this situation: "Special attack units are often sent out between air raids by enemy carrier borne planes. Therefore, it is essential that flying suits and other equipment be always held in readiness with the intention of taking off immediately after the air raid terminatesThe interval between enemy raids is, at the longest, two hours. Friendly airplanes are brought out from their concealment and sent out during this time."

(NOTE: To combat this tactic a TCAP or snoopers flight timed to fill the lull between strikes should be able to destroy previously camouflaged planes and also protect the task force from possible attack.)

Weather conditions have a bearing on the altitude of approach used by suicide planes, according to the documents. In clear weather, an approach at 20,000 - 26,000 feet is recommended. Attack from that altitude is begun about 10 miles from the target in a glide to 5,000 - 6,500 feet, with the engine throttle to about 17 inches of mercury. If the pilot discovers he will overshoot he is instructed to dive steeply to a point short of the target, recover to horizontal flight and then resume his glide.

Minimum and low altitude approaches apparently are dictated by cloud formations. If there are scattered clouds, a medium altitude approach may be expected immediately under or between them, with no glide preceding the dive. If there

ANTIAIRCRAFT ACTION SUMMARY

is low cloud cover the plane will approach just above the water, rising to the base of the clouds just before diving.

"In cases where there are scattered clouds or where thick clouds cover the skies, it would be well to skirt under the clouds. However, if the approach is made in the breaks between scattered clouds, sharp lookout of the sky above must be maintained.....If the assault is made from a medium altitude, every possible advantage presented by the existing weather condition will be exploited and the attack will be made without preliminary movement."

(NOTE: These instructions may give CAP a clue to the altitude at which an approach may be expected under different cloud conditions.)

The document recommends that "a flight consist of two fighter-bombers and two direct escort planes. In such a formation each airplane and each flight are strictly cautioned not to be too far separated from each other."

Next to carriers, transports were assigned priority as targets.

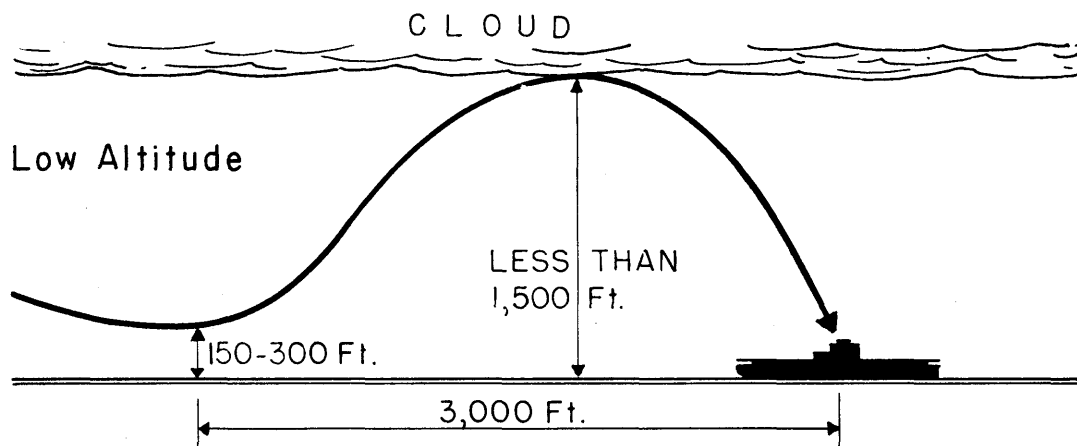
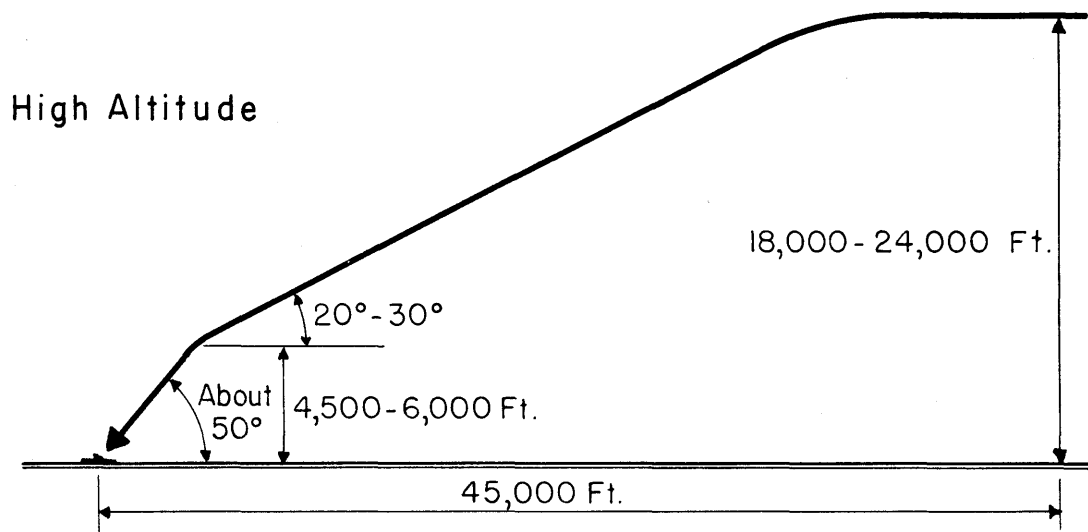
Diagrams contained in the document illustrate tactics to be employed by suicide pilots. Two of them are reproduced on the following page.

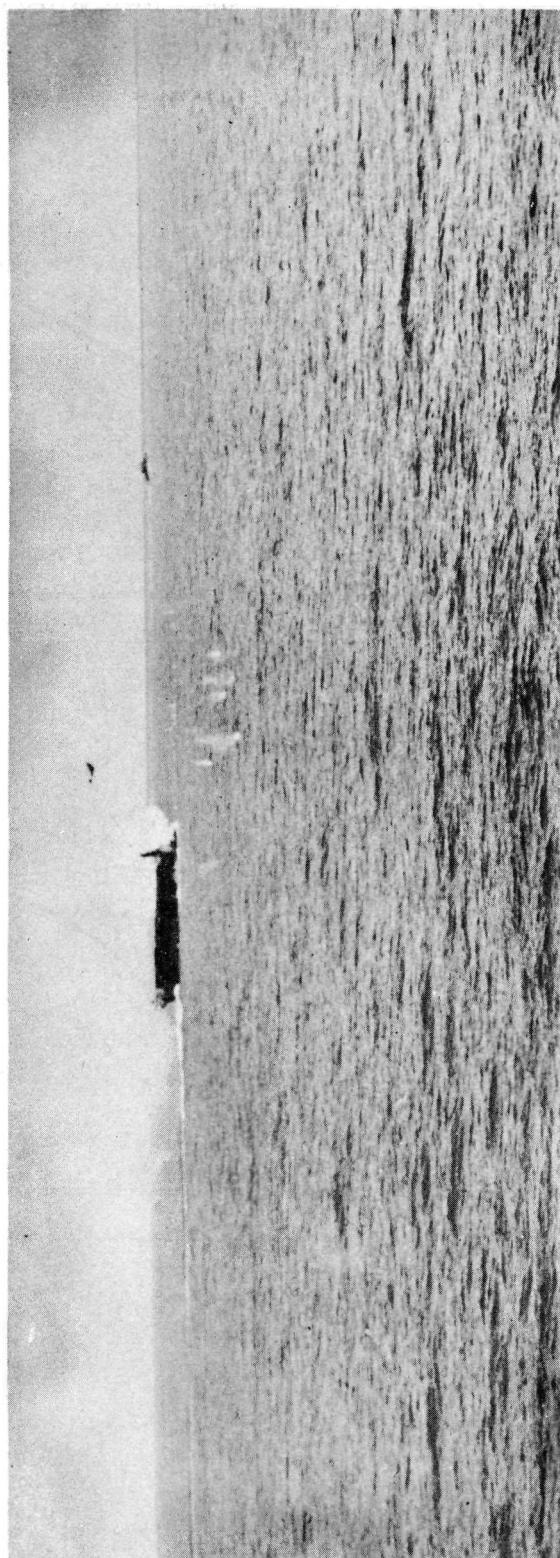
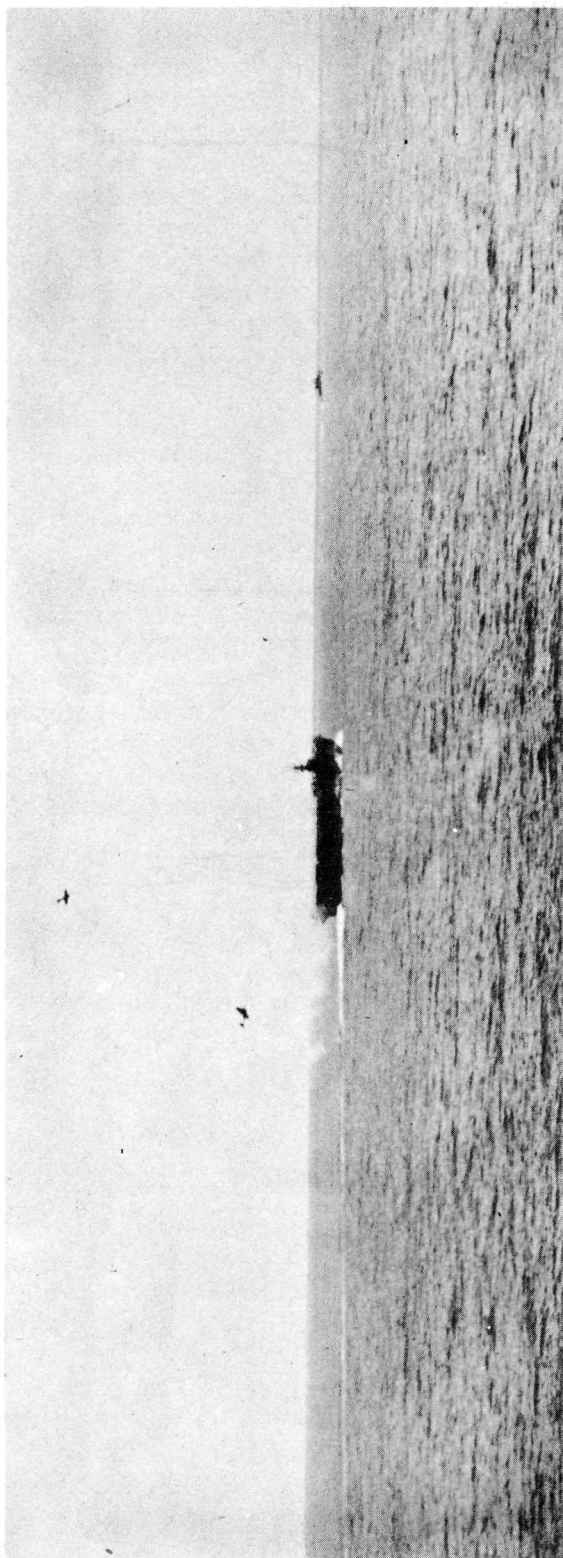
T.F. 38's Experience

An analysis of actions by fast carrier task forces against suicide attacks (29 October to 21 January) makes possible the following general statement regarding tactics employed by the enemy:

The attack usually has come in about noon from the direction of the nearest land mass, and has consisted of two groups of planes, the first of three or four planes, the second of up to 15 planes. The first group has come in at any altitude and has been followed from 5 to 30 minutes later (average 20 minutes) by the second group at a greatly different altitude and either on the same bearing or at a bearing to the right.

TYPICAL JAPANESE SUICIDE ATTACKS





Zeke making suicide crash on the SUWANEE (CVE-27) on 26 October. F6F in landing circle passes over ship.

CHAPTER IV

AA. DEFENSE ORGANIZATION

Opinion expressed in action reports is widely divided as to whether suicide tactics present a new or the same AA. problem greatly accentuated. The tactic is relatively new and currently produces about five times the success of previous forms of attack. The AA. problem is also new as long as the large proportion of the attacks is of a surprise nature and defense is restricted to a very short range problem. When search and lookout proficiency improves to the point that fire control contact is established either by radar or line-of-sight at the maximum range of the guns, the problem becomes essentially the same, complicated somewhat by the freedom of the attacking planes to take evasive action and the ship's necessity of producing an immediate kill.

The organization of the ship's AA. defense must be so set up as to permit handling either the long range problem of shooting down the plane before it becomes dangerous, or engaging it destructively at a very short range. The primary requirement is simplicity. The organization must be so thoroughly understood by all hands that reactions become automatic. Fire control systems in all types of ships are presently designed to permit the maximum flexibility of control between various guns and fire control equipment. Utilization of all combinations of these systems in action is entirely impracticable. They are provided to take care of changing situations and casualties to existing systems, not as a test of the skill of fire control parties in handling complicated switching. Choice of the system which will give the highest probability of success must be made prior to action. Ships still report appreciation, after their first action, of the necessity for decentralized control.

Heavy AA. Gun Batteries

The most outstanding deficiency in Fleet AA. in suicide actions to date has been the performance of heavy AA. batteries. Previously (1 January to 1 July 1944) accounting for 39 percent of the kills credited to AA., the performance of 5-inch batteries against suicide planes has dropped to 18 percent. This is due to two factors namely:

1. Failure to engage at ranges in which the primary fire control system is most effective.
2. Failure to utilize most effective fire control methods available.

Establishing fire control contact at long range is a function of radar search. Utilization of the fire control systems and methods available is a function of the ship's internal organization.

Existing primary fire control systems in combatant vessels (Mark 37 or 33) are designed for dual purpose functions. Their efficiency in handling a critical AA. problem accordingly suffers. Unfortunately this deficiency does not become apparent as a result of training because the towed sleeve, with which the bulk of training is of necessity performed, lends itself well to the shortcomings of the system. Analysis of extensive data on Fleet shooting in action indicates that the average error of the shooting with primary system is on the order of 10 mils at ranges beyond 6,000 yards. Inside that range

ANTIAIRCRAFT ACTION SUMMARY

errors rapidly increase, due to evasive action of the target, to 16 mils at 4,000 yards and 20 mils at 2,000 yards. Effective fire under such circumstances depends on:

1. Early engagement - The probability that a plane attacking in a typical situation will survive fire of three 5"/38 twins using Mark 32 fuzes is about 47 percent if fire is opened at 10,000 yards and continued into the minimum range of the battery. If opening fire is delayed to a range of 4,000 yards, there is a 70 percent probability that it will survive.
2. Large volume of fire - Where miss errors are probably large there is no substitute for volume of fire.
3. Use split battery fire - Again where the errors of each director are probably high, using the available battery split among the maximum number of directors that can bear pays dividends, especially when using VT fuzes.
4. Use short solutions; don't sit on a *smooth* solution. Since the inherent dispersion of the 5-inch batteries is low, a perfect solution with only a minor error in ballistic data (wind, density) will result in all bullets passing just out of reach of the target. Burst patterns of 20 mils, engendered by continuous small changes in the solution, are not excessive.
5. If caught in the primary system by a surprise attack, slew and shoot. Don't attempt a computer solution. Under such circumstances an estimate by eye should be dependable to 25 mils, and be within the errors of a snap solution.
6. Use the maximum percentage of VT fuzes practicable. Analyses of actions with early mods, with operability below 50 percent, show a three-to-one advantage over time fuzes. Latest mods should produce results of twice this figure. Some advantage unquestionably accrues from a small percentage of time fuzes. An initial timed burst at long range is an invaluable marker for other batteries. The psychological effect of an occasional timed burst on both the firing ship and target should be considered. Fall of VT fuzed projectiles in enemy territory is now authorized. Fall of such ammunition among our own troops is to be avoided. Use of VT fuzes at short ranges is essential to eliminate possibilities of obscuring the target and of providing clues to the attacking plane for taking evasive action. At long ranges percentage should not drop below 75 percent; at short ranges 100 percent VT should be used.

AA. DEFENSE ORGANIZATION

7. Be prepared to use optical ranging when required. Several reports have indicated dependence on the rangefinder in suicide attacks because of multiplicity of planes or interference from a heavy burst pattern.

Virtually all combatant vessels and many auxiliaries are equipped to control their heavy AA. guns from some form of a lead-computing director (Marks 51, 52, 57, and 63) either as primary control in the case of the lesser ships, or as auxiliary directors in large combatant ships, with cross-connection to an adjacent 40mm. director. This type of director provides marked improvement in speed and flexibility of control of the heavy AA. batteries and suffers much less from evasive tactics of a close-in target than do the slower primary director systems. The accuracy and effectiveness of their control depends on skill of the director pointers, the accuracy of the range setting and the ballistics of the director.

The diagrams at the end of this chapter indicate errors to be expected as a result of improper ballistics and indicate range values within which the fire is effective for the 40mm. using 5-inch ballistics. The errors for the reverse process are almost identical, with the exception that the 5-inch fire then leads the target - a not undesirable situation. Analysis of previous experience with 40mm. mounts and the Mark 51 director, with estimated range setting, indicates errors on the order of 15-20 mils at ranges between 1,000 - 4,000 yards. With VT fuzes and such control the probability that a suicide plane brought under fire inside of 4,000 yards will survive is considerably less than one-third its survival probability if the primary director control system is used.

Utilization of auxiliary control systems for heavy AA. batteries as a solution of the short range problem has lagged in many ships because of the administrative problem involved in decentralization of control of these weapons. With the limited experience of the crews and a large concentration of friendly ships and planes in the vicinity, commanding officers become loathe to place control of the 5-inch battery in stations other than the primary director system, where the most experienced personnel inevitably are located. The reduced efficiency of such a procedure is unacceptable in face of the seriousness of the new attacks.

A definite organization is required that must vary considerably between ship types. It must be clear cut and the responsibilities of the various stations clearly outlined. The guiding principle should be that where possibility of surprise attack exists the heavy batteries should be distributed to sector control directors leaving the primary directors free for search and engagement of targets at long range. If a surprise attack occurs, there is no time for changing the fire control set-up, whereas if a target is contacted at long range sufficient time exists during solution of the problem to make the necessary decisions and shift of the 5-inch battery to primary.

The following excerpt from an action report describes a good example of proper organization of the heavy AA. battery:

ANTIAIRCRAFT ACTION SUMMARY

USS VINCENNES-- (Capt. A. D. Brown, C.O.)

"The events of the operation covered by this report served primarily to indicate further the effectiveness of the enemy's aircraft suicide dive attacks. The following paragraphs describe the AA. setup effectively used by this vessel during daylight after any approaching bogeys are suspected of having penetrated the cone of silence of the SK radar:

"The centerline 5-inch mounts are left switched to the forward and after Mark 37 directors and Mark 1 computers respectively, ready to take under fire in full automatic control the most dangerous targets, in accordance with the standard 5-inch doctrine. This setup rarely permits the centerline mounts to fire on an enemy plane not detected until in its dive, but does leave them available to take under fire more distant, approaching planes. These mounts use 50-50 VT and AAC projectiles."

(NOTE: A minimum of 75 percent VT is recommended for this battery. Retention of centerline mounts on the primary directors is justified where adequate coverage of the arc of the gun is not provided by the 40mm. or auxiliary directors.)

"The four waist mounts are switched to the four Mark 51 directors in their respective quadrants and follow the signal in indicating, while the 40mm. quads follow in automatic. The communications are divided likewise into quadrants, or sectors, as are the 20mm. circuits. These 5-inch mounts use 100 percent VT projectiles, and their standby condition is with a load in each tray ready to ram, and with the local firing circuit closed. The 40mm. twins are also in their indicated sector."

(NOTE: Control of 5-inch mounts from Mark 51 directors, either 40mm. or auxiliary 5-inch, has been authorized, and should be used.)

"The control of this setup is handled by the air defense forward and aft officers, who, receiving all available pertinent information from an AA. liaison officer in CIC, exercise direct control of their respective Mark 37 directors and advisory control of their respective sectors. Each sector, in turn, is controlled by an officer who exercises direct control of his respective Mark 51 director, with its associated 5-inch and 40mm mounts, and supervisory control of the 20mm. guns of his sector. When an enemy plane is visually observed (frequently already in its dive) in a sector, it is designated verbally to the director, which reports 'on target'; the sector control officer orders 'commence firing' to his sector: the 5-inch and 40mm. mounts commence at once, while the 20mm. guns commence only when the target is within their range. At the order 'cease firing' from the sector control officer, all guns comply and return to the ready position."

(NOTE: The director controlling the mounts also should have the authority and responsibility for opening fire when such situations require.)

AA. DEFENSE ORGANIZATION

"The setup described above is considered extremely effective against suicide diving planes. Since it has been in use on this vessel, only two planes have dived on vessels of the formation of which the VINCENNES was a unit. However, both of these were taken under fire; one was probably damaged before it hit its target and the other was shot down in flames."

Automatic Weapon Battery

The outstanding feature in the engagement of suicide planes by automatic weapon batteries has been the character displayed by the men on the guns shooting it out. The ability of some planes to survive an incredible number of hits and still land on board has resulted in the conclusion that the plane has to be disintegrated to prevent its causing damage. While unquestionably a sure defense, only 20 percent of the planes deflected have actually been disintegrated or received severe structural damage to date. Of the successes due to automatic weapon fire, 63 percent has been credited to 40mm. The 20mm. guns have, however, done considerable execution and must be considered as an effective factor in the defense.

Shortcomings of the automatic weapons are typical of previous experience, namely, opening fire too early, insufficient lead, guns being drawn off the most threatening target, and poor fire discipline relative to the safety of adjacent ships.

Considerable improvement remains to be effected in decentralization of control, specific doctrine in range setting for 20mm. guns, responsibility of guns crews for lookout, and dissemination of information to guns. In respect to the last factor, many ships have existing loudspeaker announcing systems which can be used for rapid dissemination of target information. This is particularly true in the carriers, whose bull horns reach virtually all parts of the topside.

Use of the Mark 14 gun sight has received some criticism in suicide actions. Intelligent use of the sight and expert range setting, however, still produce the greatest expectation of hits. A recent report from a training activity shows over a six-month period the sight producing about 150 percent of hits that were obtained by tracer control. For ships under direct attack by a diving plane rapid shift to a 400-yard setting is recommended for ease in getting on and control against a point blank target. For assisting ships range setters must be alert to provide a generous range setting to lead the target, compensating for its acceleration during the dive.

Radar Search

The difficulties that have been imposed on early radar detection of Jap suicide planes have been aptly summarized by CTF 38:--

Task Force 38 -- (Vice Adm. J. S. McCain, Commander)

"By combining the suicide dive with the lessons gained in past actions and a careful analysis of our defensive system, particularly our use of radar, the

ANTIAIRCRAFT ACTION SUMMARY

Japs have developed the latest and most threatening problem that has yet confronted the U.S. Navy. The evasive-approach suicide attack shows not only the fanatical mind of the Jap, but what is far more dangerous, the application by the pilots and operations personnel of a complete understanding of radar and the complexities of air defense and air control. Specifically they have demonstrated an understanding of the following principles:

- "(1) That a small group of planes attracts far less attention than a large group on a radar screen.
- "(2) That an attack group approaching above or near returning strikes, which invariably straggle all over the skies in small groups, is very difficult to detect.
- "(3) That if a bogie is at the same range, but 5 to 10 degrees off in bearing from a friendly, the average operator will have great difficulty in detecting the bogie, and when he checks each of the numerous straggling strike groups so carefully that he can tell a bogie in their midst, the radar is able to do very little searching.
- "(4) That a bogie at the same range and bearing but vastly different altitude from a friendly appears as a friendly.
- "(5) That multiplicity of small targets is one of the weaknesses of any radar system or, for that matter, of any defense system.
- "(6) That altitude has always been a weak point in radar defense, and that although the SM can hold a target and give accurate altitude on it, a number of small targets changing altitude and course are extremely difficult to track and obtain continuous correct altitude.
- "(7) That we search with one type of radar set and, finding a target, try to coach the Fighter Director Set (SM) onto the target for evaluation, altitude, and tracking if necessary.
- "(8) That by approaching very high in fast power glide from long range, the radars are given a particularly difficult problem, both by lack of altitude estimates on the SK-SC and by being continuously in the null area of some sets.
- "(9) That the use by the enemy of dull black planes for these attacks makes visual sighting most difficult.

"The use by enemy of an IFF that looks like Mark III Code 1, 2, or 3 is definitely established. The possibility of the enemy using planes with the outstanding silhouette characteristics of the F6F should not be overlooked."

The problem of search for fighter direction and tactical purposes differs from that of search for AA. requirements. The former requires early detection at the maximum possible range. The AA. problem, however, commences at 15 miles. At night, with relatively few planes in the air and reduced fighter direction demands, considerable success has been had in coordinating the two problems. In suicide actions, however, the concentration of friendly planes, the non-cooperative tactics of the Japs, the frequent proximity to land and the demands

AA. DEFENSE ORGANIZATION

of fighter direction result in CIC providing little assistance in establishing fire control contact in a large majority of the cases. Although no single typical case can be presented the experience of TG 77.2 well illustrates the situation:--

"At 1702 the ship went to General Quarters upon receipt of report of bogie, bearing 270 degrees (T), distance 45 miles, closing the formation. The bogie was tracked in from 75 miles to 45 miles, where it was lost in geographic returns from the area. The Army CAP was vectored to intercept and later reported shooting down one twin-engined plane.

"At 1715 visual reports were received of enemy planes overhead, in the sun.

"At 1716 an enemy plane, believed to have been a twin-engined Lily or Frances, was sighted by this ship's lookouts, coming out of the sun at about 8,000 feet, parallel to the course of the formation. The plane was taken under fire by 40mm. batteries from U.S.S. NEW MEXICO. Less than 5 seconds later the plane had peeled off into a dive on opposite course coming in over the port bow of the OMMANEY BAY in a dive of 45 degrees.. The plane struck the ship on the starboard side of the flight deck, just aft of the island structure."

(NOTE:-At 220 knots this raid would be over the formation at 1715.)

Extensive comment has been made on the deficiencies of existing equipment for short range and high angle search. Many specific recommendations have also been received for better utilization of existing equipment, principally in the employment of fire control radar to augment the existing search coverage. An elaborate AA. coordination plan was proposed by ESSEX (CV-9) aimed at better dissemination of information for the AA. problem, coordination of search by fire control radars and centralized control or coordination of AA. fire. Task Groups 58.3 and 58.4 have proposed trial of the plan but report of its application has not been received to date. CTG 58.4 statement of the plan is quoted below:

Task Group 58.4-- (Rear Adm. R. W. Radford, Commander)

"1. The purpose of the AA. Coordination Plan is to assist in the detection of close-in bogeys, shifting of contacts from search to fire control radars, and the early engagement of enemy planes by concentrated gunfire while guarding against further undetected attacks.

"The plan provides for:

"(a) Sector assignments for search and for distribution AA. fire in event of multiple targets.

"(b) A close-in radar search using fire control radars.

"(c) A voice radio circuit for the dissemination and exchange of AA. gunnery information.

ANTIAIRCRAFT ACTION SUMMARY

"(d) An AA. coordinator stationed in the flagship.

"2. This plan will be placed in effect upon sortie from Ulithi, and will be operative when Condition One is set in AA. batteries.

"3. AA. Coordination Plan.

"A. Sector Assignments.

- "1. Heavy ships are assigned sectors of 120° ; 60° on each side of the bearing line from the disposition center.
- "2. The ship at the center of the disposition is assigned a 360° sector, but will concentrate on most likely bearing of approach.
- "3. Destroyers are assigned sectors of 150° ; 75° on each side of the bearing line from the disposition center.

"B. Fire Control Radar Search.

- "1. Ships may search at discretion, covering their own sectors as thoroughly as practicable and will track contacts in their assigned sectors.
- "2. Search with AA. fire control radars will be conducted using 20° antennae elevation with Lobing "On". Main battery radars may be used for low altitude search.
- "3. When searching, the sector should be covered at approximately one minute intervals.
- "4. Contacts will be reported on the AA. coordination circuit, giving call of ship reporting and the bearing, range, and altitude. All bearings will be true bearings. Amplifying reports will be made when further information is available.

"C. Communications.

- "1. The AA. coordination circuit will be established, and will be cleared of all other traffic during Condition I.
- "2. Standard voice procedure and TBS calls will be used.
- "3. The purpose of this circuit is to provide a channel for the INTERCHANGE of AA. gunnery information between ships of the task group.

"D. Special Instructions.

- "1. The group AA. coordinator is in no sense a control officer.

AA. DEFENSE ORGANIZATION

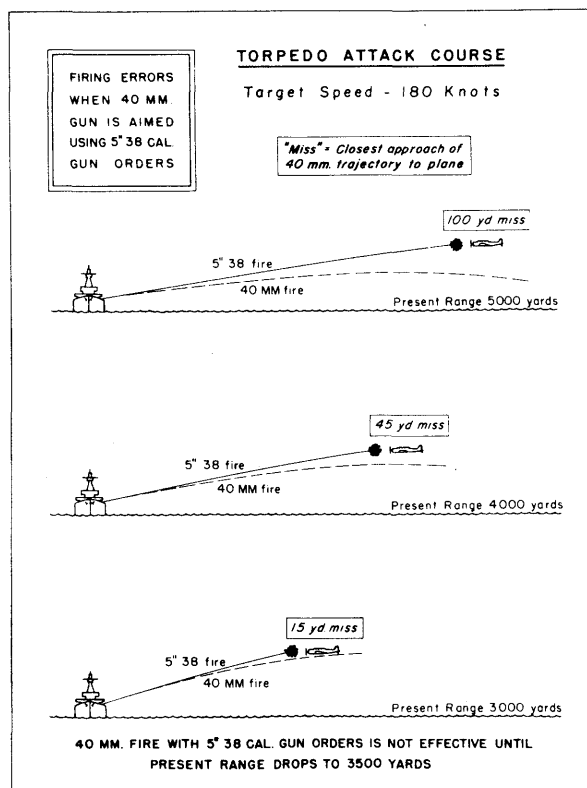
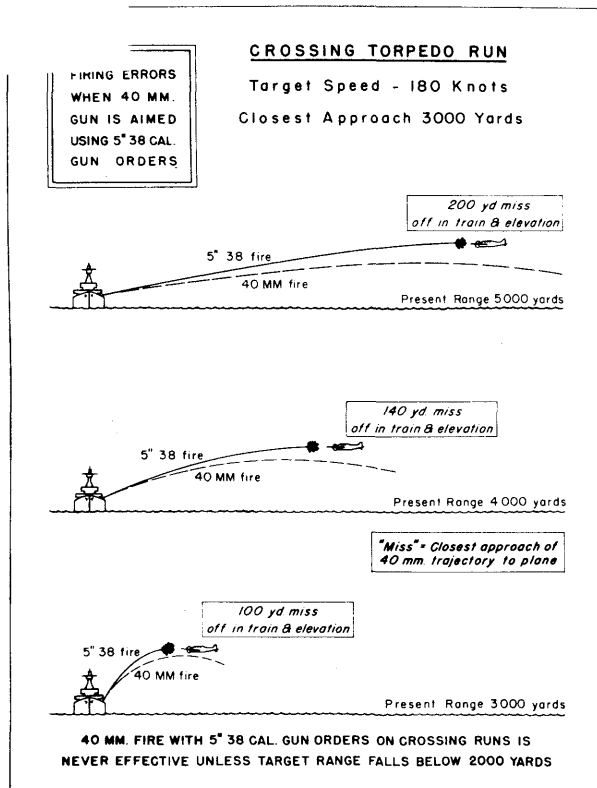
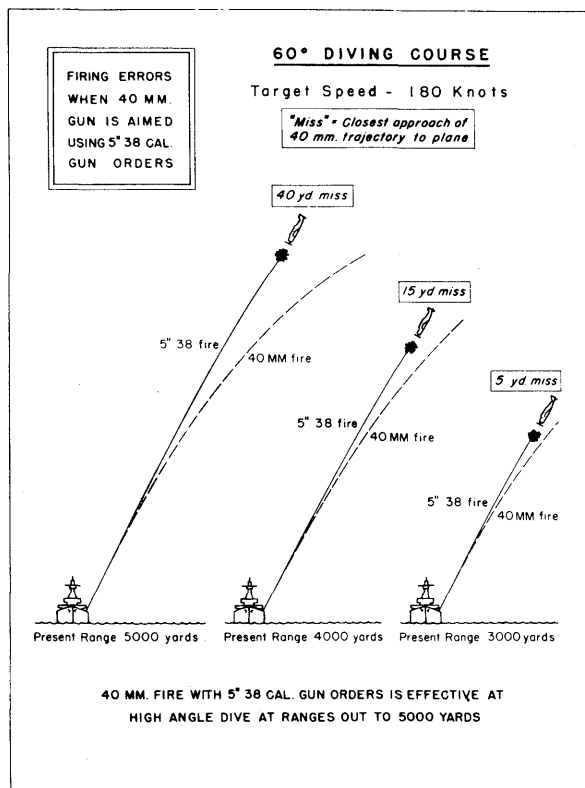
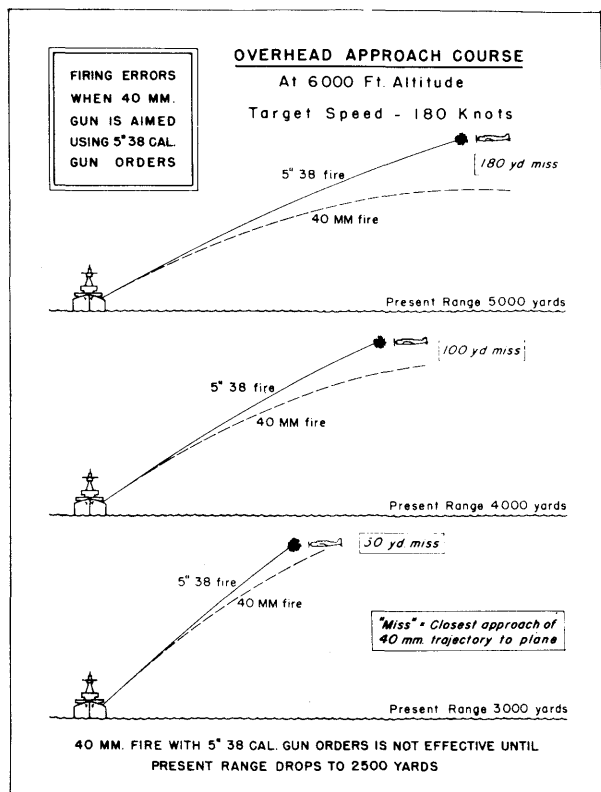
His purpose is only to provide information and to coordinate effort, aiming toward early engagement of enemy planes.

- "2. Sector assignments in no way restrict the bearings on which a ship may fire. Sectors are NOT "sectors of responsibility". However in case of multiple targets, the primary target will be those approaching in the assigned sector.

"4. A close liaison must be maintained between CIC and AA. control stations of individual ships in order to utilize all available information.

"5. It is hoped that this plan will increase the effectiveness of AA. gunfire by providing close coordination, and early engagement of enemy planes. The additional information available should facilitate "picking up" targets at longer ranges. No restrictions are placed on freedom of action by individual ships in repelling air attacks. Since this plan is in an experimental stage, criticisms and comments are desired."

The concept of the first two functions is excellent. It is essential that information flow both within the ship and between ships of the task force as to location or probable location of targets within a radius of 15 miles. Establishment of a search plan for fire control radars is properly a function of the Task Group Commander and should be varied to meet the existing situation. No search plan with a fire control director, however, should interfere with an individual ship's establishing fire control contact by either radar or line of sight on an enemy plane. Coordinated control of AA. fire of a task group should be either permissive or restrictive. Detailed control and target designation in the fast-moving AA. problem in general would be impossible.





OMMANEE BAY (CVE-79) about four minutes after being hit by suicide plane in Sulu Sea. She sank about an hour later. WEST VIRGINIA (BB-48) in foreground.

CHAPTER V

SUICIDE ATTACK SUMMARIES

Surface forces of the Seventh Fleet, engaged in the occupation of Leyte, Mindoro and Luzon, have borne the brunt of suicide attacks during the period from 1 October 1944 to 31 January 1945. However, even Task Force 38 did not escape unscathed, undergoing several attacks in October and November and again in January.

TASK FORCE 38

During carrier strikes against Formosa early in October in support of the Leyte operation, several enemy planes attempted to crash into ships after having been severely damaged. However, suicide attacks as they now are recognized were not experienced by the fast carrier task force until 29 and 30 October, when carriers were taken under attack by one and six suicide planes, respectively.

Again on 5 November carriers of Task Force 38 were the targets of suicide planes, six making attacks. Five planes evaded CAP and made dives on 25 November, and three others struck on 21 January.

The box score for Task Force 38 against suicide planes, as compared with surface forces of the Seventh Fleet, follows:

	<u>Planes Attacking</u>	<u>Planes Hitting</u>	<u>Planes Missing</u>	<u>Percentage AA. Success</u>
Task Force 38	27	13	14	52
Seventh Fleet	285	108	177	62

If damaging near misses are included as enemy successes the picture changes somewhat, as is illustrated in the following table:

	<u>Planes Attacking</u>	<u>Planes Hitting</u>	<u>Planes Missing</u>	<u>Percentage AA. Success</u>
Task Force 38	27	15	12	44
Seventh Fleet	285	159	126	44

SEVENTH FLEET

The first large suicide attack against our surface forces occurred on 25 October off Leyte, when 14 planes made attacks, 12 of them at CVE's. Attacks continued almost daily through 4 November, when a seven-day respite was enjoyed. This was the longest period of enemy inactivity ships of the Seventh Fleet were to experience until 14 January, when air opposition in the Philippines virtually disappeared.

Two large attacks occurred in November. On the 12th auxiliaries, amphibious and merchant ships were attacked by 17 planes, and on the 27th, 15 planes tried to crash cruisers and battleships in Leyte Gulf.

ANTIAIRCRAFT ACTION SUMMARY

The first attack in December occurred on the 5th, when 11 planes dived on destroyers and smaller ships. Two days later, during the Ormoc Bay landing, 18 planes attempted to crash DD's and small ships. The largest attack during the month was on the 15th, date of the Mindoro landing, when 21 planes tried suicide crashes on BB's, CVE's, DD's, and 12 smaller vessels.

Attacks continued at Mindoro until the beginning of the Lingayen operation in January. Seventeen planes attempted suicide hits on the 5th, and 22 others on the 6th. Cruisers, DD's, CVE's and BB's attracted most planes, and considerable success was enjoyed by the enemy.

It will be noticed that the largest attacks occurred during the early phases of each of the four amphibious operations -- Leyte Gulf, Ormoc Bay, Mindoro and Lingayen -- when air cover was weakest and conditions were favorable for surprise attacks from landward.

The tempo of enemy aerial effort in the form of suicide crashes has increased steadily. In October 43 planes tried suicide crashes on the 11 days on which attacks occurred. In November this number increased to 73 planes in 13 days, and in December to 97 planes in 16 days. In January attacks were made on 13 days, and 99 planes made suicide tries.

It is interesting to note that 214, or 68 percent, of the 312 planes which actually made suicide crashes through January, selected ships of destroyer size or smaller as their targets. Of the 98 remaining, 52 tried to crash CV's, CVL's and CVE's.

NARRATIVE ACCOUNTS OF ANTI-SUICIDE ACTIONS

Task Force 38 (25 November)

Task Group 38.2 underwent an attack by suicide planes at noon on 25 November while making air strikes against Luzon. The action occurred about 160 miles east of Manila.

This attack consisted of approximately a dozen planes which eluded CAP and approached at low altitude and high speed. Antiaircraft fire accounted for five of these planes. Three are believed to have escaped. Of the remaining four, two crashed on the flight deck of the INTREPID (CV-11), and one crashed on the catwalk and flight deck of the CABOT (CVL-28).

While Task Group 38.2 was under attack two planes threatened carriers of Task Group 38.2. One crashed on the flight deck of the ESSEX (CV-9), and the second was shot down while attacking the TICONDEROGA (CV-14).

This was Task Force 38's fourth encounter with suicide planes. On 29 October one plane got through to Task Group 38.2, hitting INTREPID (CV-11) on a 20mm. gun tub. The attack experienced by Task Group 38.4 on 30 October was more vicious. Of six planes attacking, one crashed FRANKLIN (CV-13), another

SUICIDE ATTACK SUMMARIES

hitting BELLEAU WOOD (CVL-24) and four being splashed by AA. On 5 November three planes made dives on carriers of Task Group 38.3, one crashing into the island structure of the LEXINGTON (CV-16), one crashing close aboard the TICONDEROGA (CV-14), and a third also being shot down by ships' gunfire.

The air attacks of 25 November were preceded by the radar detection of bogeys at ranges of 40 to 80 miles. Ships went to general quarters at 1220. There were numerous reports of enemy aircraft in the vicinity but none was sighted until 1233, when a single plane dived on HANCOCK (CV-19).

This plane, a Val or Judy, approached the carrier from the south out of the sun at an altitude of 10,000 feet, went into a shallow dive which was increased to about 45 degrees. At about 1,500 feet the plane dropped a bomb, and apparently was pulling out when hit by a 5-inch projectile and disintegrated in the air.

The bomb struck the water on the port beam of the HANCOCK. A blazing wing section fell on the carrier's flight deck and caused a small fire. There is some question whether this was a suicide plane, as some observers reported it had started to pull out of its dive when it was hit.

For the next 15 minutes no planes were observed, but at 1250 three Jills low on the water were observed astern of the formation to the westward. Fire was opened at about 6,500 yards. The leading plane was hit immediately and disintegrated. The second plane, heading toward the INTREPID, was shot down by 40mm. weapons. The third zoomed sharply upward to an altitude of several hundred feet, and despite machine gun hits fell off on one wing and crashed onto the INTREPID'S flight deck.

Four minutes later a Judy was sighted astern at 6,000 feet, diving toward the center of the disposition. Hit by 40mm. and 20mm. fire, the plane rolled over at least twice, went into a tight spin and crashed in the water inside the disposition, about 100 yards from the IOWA (BB-61). At approximately the same time (1258), another enemy plane made a shallow dive from astern of the INTREPID and crashed on the flight deck amidships.

At about 1300 the CABOT was attacked by a single plane which came in from the south of the formation, turned to the left and crashed on her bow. Hits from automatic weapon fire were observed, but the plane, although apparently out of control, struck the port side of the CVL's flight deck well forward and fell into the water alongside.

A few minutes later a plane dived from directly astern of the CABOT. This plane was hit by machine gun fire and crashed into the water close aboard the CVL. It apparently was out of control, but did not burn until it crashed. Its bomb exploded, adding to the damage caused by the previous hit.

NOTE: This attack occurred when carriers were attempting to recover planes returning from strikes. Radar screens were confused by the presence of many planes, and as a result of the confused

ANTIAIRCRAFT ACTION SUMMARY

CIC plot the 5-inch batteries were unable to pick up the dive attacks soon enough to provide an effective firing solution. This situation might have been improved had friendly planes been vectored to a small area away from the disposition as soon as enemy planes arrived within ships' gun range.

Task Group 77.2 (27 November)

Several heavy suicide attacks were pressed against Task Group 77.2 during its operations in the Philippines during October, November and December, but one of the most serious occurred on 27 November in Leyte Gulf.

This task group was composed of four BB's, five cruisers and seven destroyers, of which the larger ships were singled out for attack. Hits were scored on COLORADO (BB-45), MARYLAND (BB-46), ST. LOUIS (CL-49), MONTPELIER (CL-57), and AULICK (DD-569).

When the attack began at 1125 the ships were in fueling disposition, with WEST VIRGINIA (BB-48), and CONWAY (DD-507) fueling from CARIBOU (IX-114) in the center and heavy ships circling the center at 15 knots on Circle 3. AA. disposition was assumed, with the fueling ships moving to the screen.

An estimated 13 Jills, Kates and Vals engaged in the attack. At the time the attack started radar screens of the task group had nothing but friendly indications. First warning came when a bomb dropped out of the clouds and landed near the formation. At the same time a plane dived toward the ST. LOUIS, breaking up as a result of AA. fire.

Dives were made from an altitude of approximately 4,000 feet at angles of 30 to 45 degrees. Two suicides landed on the ST. LOUIS, one aft and one amidships, burning the after part of the CL, destroying catapults and planes and damaging after turrets. Two dived on the COLORADO, one striking amidships on the port side and the other going in the water close aboard.

MONTPELIER, attacked by four planes, was more fortunate. Three passed over the ship, crashing in the water. The fourth inflicted minor damage by ricocheting from the water into the side dishing of the support structure of one 5-inch mount.

Two or three other suicide planes were so badly damaged that they missed completely, and several others were exploded in mid-air by hits.

It is estimated that three planes got hits on ships, one scored a damaging near miss, and eight or nine were shot down, largely by automatic weapons.

During the period of the attack - 1125 to 1156 - the ships were entirely without air cover. Several times prior to the attack OTC requested that CAP be provided, as weather conditions over the task group were fair and it was felt that air cover was necessary. When the attack developed the task group

SUICIDE ATTACK SUMMARIES

fighter controller was asked if he had any fighter under his control and the reply was in the negative. Immediate steps were taken to obtain CAP. At about 1200 P-38's began to appear over the group and shot down one enemy plane.

No effort was made to attack destroyers. Attacks were determined, planes diving from 4,000 feet and weaving violently until just before the crash. One plane only circled the formation and disappeared without making an attack.

NOTE: This attack was typical in that it was a complete surprise, denying ships the use of 5-inch batteries at long range. As in the case of many large suicide actions the absence of air cover was an advantage to the enemy.

Task Group 78.3 (7 December)

The landing at Ormoc Bay in the Leyte operation met with vigorous aerial opposition, 45 to 50 planes attacking Task Group 78.3 in a nine-hour period on 7 December.

Comprising this task group were three transport units composed of APD's, LCI's, LSM's, and LST's; a minesweeping unit composed of AM's and APD's; a control and inshore support unit, composed of SC's, LCI(R)'s and ATR's and an escort unit composed of 13 DD's.

Enemy air attacks commenced at 0820, an hour after the first wave reached the beach. Considerable air support was present throughout the day, and P-38 pilots of the CAP did an excellent job, but on several occasions Japanese planes slipped through CAP and AA. fire. Six ships were struck by suicide planes.

The first successful attack occurred at 0945, when both the WARD (APD-16) and MAHAN (DD-364) were so severely damaged that they had to be sunk later by ships' gunfire. At 1130 the LIDDLE (APD-60) was crashed, but was able to continue when emergency repairs had been effected. The third suicide crash occurred at 1445, when the LAMSON (DD-367) was hit, set afire and had to be towed back to San Pedro Bay. LST 737, which suffered minor damage, was able to remain in formation. LSM 318 was bombed and crash dived, burning all night, and LSM 18 was hit and damaged by parts of a disintegrating Jap plane.

Commander Task Unit 78.3.5 reports observing 14 planes destroyed by AA., 4 by AA. and CAP, and 12 by CAP alone. Eight planes crashed six ships, three of them hitting the MAHAN. Destroyers alone fired 2,081 rounds of 5-inch ammunition, 5,379 of 40mm. and 6,224 of 20mm. Huge quantities of automatic weapons ammunition, were expended by amphibious ships and auxiliaries. Because of the proximity of land, ships did not use VT fuzes in 5-inch projectiles.

Best AA. performance was put up by EDWARDS (DD-619), which claims the destruction of four planes with 5-inch fire and the damaging of one. She is credited by CTU 78.3.5 with three "sures". MAHAN shot down four of the nine

ANTIAIRCRAFT ACTION SUMMARY

planes attacking her. Three crashed the DD, one fell victim of CAP, and one escaped.

Enemy attacks were directed primarily at destroyers. Two general types of suicide attacks were made: Low altitude glide attacks, such as that involving the MAHAN, and high-speed dives from 2,500 to 3,000 feet. The approach was made, using cloud cover, from a position astern of the ship to be attacked. Planes then executed a wingover and steep dive, changing to a glide just before hitting, with the base of the bridge structure being used as the point of aim.

The attack against the MAHAN while she was patrolling alone was perhaps the most severe experienced to date by any ship, and is described in detail.

At 0943 the MAHAN sighted a formation of planes 10 miles to the east. They were at a high altitude, on a southerly course. At 0947 planes were sighted approaching from the southeast at an altitude of 4,000 feet and range of 10,000 yards. Flank speed was assumed and the rudder put full left. At 0948, with the targets bearing 20 degrees on the port bow, range 4,000 yards, the planes were identified as nine twin-engined bombers, with a cover of four fighters.

The MAHAN commenced firing as the Bettys passed ahead of the ship, horizontal range 3,000 yards, altitude about 3,000 feet. It was noticed that three P-38's were overhauling the enemy and fire was checked after three salvos. Within a few seconds one P-38 knocked down one enemy fighter, another splashed two fighters, and the third hit two of the bombers.

Almost immediately the nearest bomber, smoking, went into a steep banking dive to the right to attack the MAHAN. Gun fire was resumed at 4,000 yards and the rudder shifted full right. The plane leveled off at 50 feet, 2,000 yards, and headed toward the bridge structure, bursting into flames and blowing up about 50 yards from the ship as a result of 40mm. and 20mm. fire. The second bomber, apparently blinded by the explosion, passed above the stacks, went out about 2,000 yards, returned low over the water and hit the ship abreast 5-inch gun No. 2 between the water line and the forecastle deck level. A P-38 came in, trying to shoot down the plane before it hit the ship, but was unable to do so.

In the meantime the third bomber to start in was shot down by the ship's 5-inch fire about 2,500 yards on the starboard beam. The fourth was shot down on the starboard side. The fifth Betty hit the ship just abaft the bridge at the forecastle deck level, knocking down the foreward stack and foremast, and the sixth hit the starboard side at the waterline.

The seventh bomber came in strafing the after part of the ship, passed astern, returned to strafe the bridge and forward part of the ship, burst into flames and hit the water about 200 yards ahead of the ship. The eighth, set aflame by P-38's, came in from the port quarter, attempted to crash the ship, missed and hit the water 100 yards off the starboard quarter. The last of the

SUICIDE ATTACK SUMMARIES

nine planes, which approached at intervals of 1,500 yards, strafed the after part of the bridge, zoomed overhead and was not seen again.

NOTE: The attack against the MAMAN was the first multiple attack against a ship by twin-engined planes using torpedo tactics. This DD gave an excellent account of herself before succumbing. Several ships have recommended, since suicide planes prefer to attack single ships, that ships be assigned to patrol and picket duty in pairs. Proximity of land interfered with early radar detection of enemy planes and the use of VT fuzes.

Task Group 78.3 (15 December)

LST's were the principal target for suicide planes during an action in Mangarin Bay, Mindoro, the morning of 15 December. Two ships received lethal hits and approximately six planes were shot down.

Task Unit 78.3.4 steamed into the bay at six knots. Visibility was good, and ships were at general quarters. At 0850 about 12 enemy planes were sighted approaching from the southeast at 10,000 yards range, elevation 100 feet. The planes disappeared behind Ambulong Island, and reappeared on course 350° T at 200 knots.

Planes commenced individual attacks on ships of the formation, appearing to concentrate on LST's 472, 738 and 619. One plane approached the 472 from the starboard side, heading for the bow. Automatic weapon fire splashed the plane 50 yards on the port side of the ship. Two other planes came in from starboard, one hitting the after gun tub with a wing and careening into the water. The third, gliding from 3,000 yards, came through heavy gunfire and crashed into the side of the ship at deck level just forward of the main deck superstructure. A fourth plane, strafing, tried a wingover but overshot his mark and crashed in the water just off the port beam. Two additional planes attacked, one strafing but causing no damage, and another, diving at the bow, crashing in the water on the port side. The ship continued to fire after being hit. She sank as a result of internal explosions after being abandoned.

LST 738 was attacked by two planes, one striking amidships just above the water line. Explosion and fire resulted. The second, which headed for the bridge and missed, was shot down on the ship's port side. Declared unsalvageable, she was sunk by gunfire the following day.

Four planes attacked LST 619 and all were shot down. The first, diving for the bridge, was hit in the engine and wing. It climbed to 100 feet, stalled, described a loop and fell into the water 100 feet on the starboard beam. The second also headed for the conning tower and began to strafe. Hit by gunfire, he veered and crashed 200 yards off the stern. The third plane, on a parallel course with the ship at 200 yards range, had his tail surfaces damaged and hit LST 738. After 472 and 738 had been hit a Japanese fighter heading for the bow was taken under fire. His port wing was cut off by 40mm. fire and he fell into the water off the bow of 472.

ANTIAIRCRAFT ACTION SUMMARY

Two fighters dived at LST 605, and both were shot down. One passed over the boat deck and crashed 20 feet off the port quarter. The other crashed 100 yards astern after being hit by stern guns. A third plane, attacking LST 909, also was hit and splashed.

Several other LST's claimed kills, but it is estimated that when the action concluded six planes had been shot down in addition to those hitting ships.

NOTE: Because automatic weapons comprised almost the entire armament of these amphibious ships, most AA. successes are the result of combined fire of several ships. Ultimate armament for LST's is two 40mm. twins, four 40mm. singles and 12 20mm. mounts. Lacking speed and maneuverability, amphibious ships must depend for their defense upon continuous air cover, supporting fire by escorts and their own concentrated automatic weapon fire. Smoke as a passive means of defense is desirable under some circumstances.

Task Group 77.4 (January)

During the Lingayen Gulf operation in early January CVE's were attacked heavily by suicide planes. Six were hit by planes and one, the OMMANEY BAY (CVE-79), was sunk. Antiaircraft actions against several attacking planes are described:

At 1855, eight minutes after sunset on 8 January, ships of Task Unit 77.4.3 opened fire on two enemy planes circling on the port bow at about 6,000 feet altitude. The AA. fire from all ships was intense. KITKUN BAY (CVE-71) opened fire at 1857 on one of these planes, which had entered a dive at the ship from a relative bearing of 330 degrees. It leveled off close to the water at 3,000 yards and crashed into the port side amidships at the water line, making a hole approximately 20 by 9 feet.

- - -

At 1714 on 3 January the LUNGA POINT (CVE-94) was taken under attack. Three Zekes got through the air cover and approached Task Unit 77.4.11, crossing ahead from port to starboard at about 9,000 feet. One Zeke peeled off and began a down-sun dive at the escort carrier. The CALIFORNIA (BB-44) and PORTLAND (CA-33) opened fire with 5-inch batteries, but bursts were too long in range. At 4,500 yards the LUNGA POINT's port 40mm's. opened fire, the starboard 40's at 4,000 yards and the port 20's at 2,500. On a heading of 345°, the ship entered a 90° turn to port. All guns appeared to score hits. The Zeke passed over the ship from bow to stern in a dive, cleared the after end of the flight deck by 50 feet, exploded and hit the water 50 yards astern. Fire was observed coming from the engine as it passed over, holes were observed in the wings and fuselage, and pieces of fabric and light metal floated down to the flight deck.

- - -

On 5 January heavy attacks were made on ships of Task Unit 77.4.2 by six to eight suicide Zekes. One was shot down by the screen, one hit ILMAS

SUICIDE ATTACK SUMMARIES

AUSTRALIA amidships; one hit the radar antennae of the SAVO ISLAND (CVE-78) and plunged into the sea alongside; one was shot down just before reaching the NATOMA BAY (CVE 62) crashing alongside that ship; and two attacked the MANILA BAY (CVE-61), the first scoring a direct hit on the flight deck, and the second striking the starboard yardarm and plunging into the sea about 30 feet off the starboard quarter.

The attack began at 1746, with planes coming in low out of the sun. The plane which hit the MANILA BAY'S flight deck came in low from 280° T out of the sun, climbed steeply, then dived into the deck. Most of the ship's AA. was concentrated on this plane, as its intentions were obvious. The second plane was not fired on from about 2,000 yards. This plane came in about 15 seconds after the first, using the same tactics. The pilot may have been wounded, or bothered by the forward 24-inch searchlight. As he went past the bridge his wing hit the yard arm, deflecting him slightly. This plane exploded as it struck the water, causing superficial damage.

- - -

The OMMANEY BAY (CVE-79) was fatally hit at 1712 on 4 January by a twin-engined plane which managed to effect complete surprise despite the fact it had been detected by radar 15 minutes earlier.

This escort carrier was a part of Task Unit 77.4.2, steaming at 15 knots on course 290° T in cruising disposition 4 Roger Oboe. Ships went to general quarters at 1702 upon receipt of the report of a bogey, bearing 270° T, distance 45 miles, closing the disposition. The bogey had been tracked in from 75 miles, where it was lost in geographic returns from mountainous islands in the area. Army CAP was vectored to intercept, and later reported shooting down one twin-engined plane.

At 1705 the radar screen was reported clear of bogeys. At 1715 visual reports were received of enemy planes overhead in the sun. The NATOMA BAY (CVE 62) sighted a plane at 1716 as it came out of the sun at about 8,000 feet, parallel to the course of the formation. Less than five seconds later the plane peeled off into a 45-degree dive on opposite course.

The OMMANEY BAY was not aware that an enemy plane was in the area until ricocheting bullets were heard and a strafing twin-engined bomber was seen in a high-speed, 45-degree dive at an altitude of about 1,800 feet, heading for the bridge from 285° T. The plane hit the ship seconds after the strafing was heard.

The plane passed over the forward part of the open bridge by a few feet, taking the superstructure off as it passed through the after part of the open bridge and penetrated the side of the flight deck at frame 74. Two bomb explosions occurred and the forward half of the hangar deck was afire almost immediately. The ship was abandoned at 1812.

Since only three seconds elapsed between the time the plane was sighted and the time it hit the ship, the OMMANEY BAY did not have time to open fire.

CHAPTER VI

NEW WEAPONS

Recommendations for new weapons with which to combat the suicide plane have appeared in a great many action reports from ships which have been attacked or which have witnessed attacks on other ships. The proposed weapons vary from a hand-held bazooka to chain shot. Virtually all of them are predicated on increasing the structural damage to the attacking aircraft at very short range.

Adoption of new weapons invariably requires replacement of some existing armament because of space and weight limitations. If such a weapon has limitations which restrict its value to a specific form of attack its value must be weighed carefully because of the initiative resting in the enemy aircraft. In general, a new weapon is of value only if it can be demonstrated as being several times superior to the weapon it replaces, if it can be made available in quantity, and if it is sufficiently versatile to retain its value in the face of changing tactics.

As stated elsewhere in this publication, the improvement to be expected from any weapon described below cannot approach the increase in effectiveness of AA. defense available by expert use of the weapons now installed.

VT Fuzes

Previous models of this fuze are now being replaced by the Mark 53, Mod.3. This fuze has a very considerably increased sensitivity, higher operability and shorter arming time (450 yards) than any previous influence fuze. It should double the effectiveness of 5-inch effectiveness in the destruction of aircraft. Mods. 1 and 2 are equally effective in performance, but have an arming time of 800 yards. This ammunition is now en route to the Fleet.

The Mark 58 fuze for the 3"/50, while not matching the performance of the Mark 53, is now in production, and should give at least three times the effectiveness of the time-fuzed burst.

The Mark 47 fuze for 6"/47 is now under test and is expected to be available shortly.

The smallest size projectile in which it appears the VT fuze can be fitted and still leave some projectile cavity available for a bursting charge is the 3"/50. Many suggestions that this fuze be developed for 40mm. projectiles have been received. There appears to be no possibility for its development. The lethal area for a 40mm. so fuzed would not be appreciably larger than the presented lethal area of a plane to contact hits.

Rockets

Development of the rocket is still in its infancy. However, it bears considerable promise for increased striking power at a limited expenditure of

ANTIAIRCRAFT ACTION SUMMARY

weight and space. Work is proceeding toward development of the 5-inch spinner with a VT fuze, an attractive possibility for anti-suicide work. A tremendous volume of fire is readily obtainable. The fire control problem created by the rocket's relatively low velocity, and the obtaining of a satisfactory arming time, are present major difficulties.

Heavy Automatic Weapons

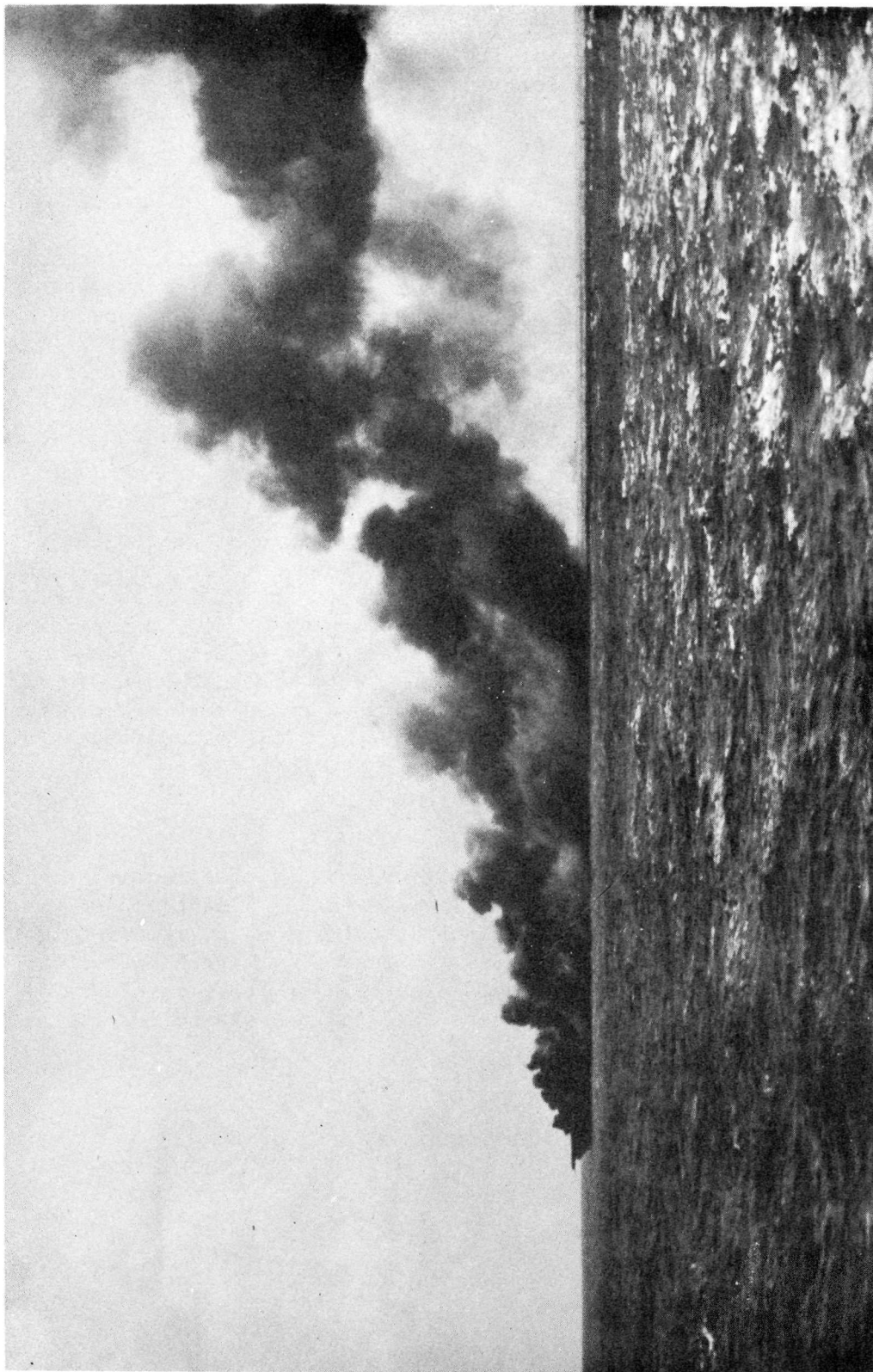
There is little gain in use of a point detonating projectile larger than the 40mm. in this type of weapon. The next step, therefore, requires a gun capable of using the greatly expanded lethal area that occurs by use of a VT-fuzed projectile. Twin 3-inch automatic loading guns with rates of fire up to 90 rounds a minute per barrel are in design. While giving every prospect of an extremely effective weapon at intermediate and short ranges, such a weapon is not expected to be available, other than for test, in the very near future.

Light Automatic Weapons

While comment from the Fleet has been almost entirely adverse as to the effect of light automatic weapon fire, the 20mm. has been responsible for a very respectable percentage of the defeats of suicide planes. The twin 20mm., mounting two barrels on the conventional free-swinging mount, is now being installed in quantity, resulting in either increased fire power or a saving in weight essential to other armament increases. Tests are also going forward on quadruple barreled 20mm. and .50 caliber guns, mounted on small power-driven mounts. Investigation of the feasibility of use of 37mm. aircraft guns also is being made.

Fire Control

Development has proceeded toward small lead-computing directors employing both pointing and ranging by radar. The Mark 63 and 57 directors are currently being installed for control of the 40mm., and indicate about two to four times the probability of hitting over the presently installed Mark 51 director. Application to 5-inch fire with VT fuzes is also being made to take care of the intermediate to short range problem, where existing systems suffer in the face of fast-breaking evasive attacks.



TICONDEROGA (CV-14) burning off Formosa at 1212 on 21 January after suicide attack on Task Group 38.3

CHAPTER VII

COMMENTS AND RECOMMENDATIONS

Responsible ship, type and fleet commanders, fully appreciating its gravity, have given considerable thought and study to the suicide problem.

Many comments and recommendations have been made, some of them impracticable, but others well considered.

Representative excerpts from action reports are classified according to subject matter. The subjects include: Use of AA. weapons; dispositions, speed and maneuvers; target acquisition; training; lookouts and recognition; AA. and fighter defense.

Use of AA. Weapons

DesDiv 120--(Comdr. J. C. Zahn, Commander)

"It has been suggested that local control of 5-inch mounts on ships attacked by suicide planes might be more effective than full director control. This suggestion might be developed further by leaving one mount on director control and firing Mark 32 fuzeed projectiles from the others in local control on the theory that the patterns would be greater and that one direct hit from a 5-inch gun would accomplish the purpose. The addition of Mark 14 sights for use in local control of the 5-inch mounts would further increase the effectiveness of such a plan."

(NOTE: Five-inch guns on DD's have alternate control from adjacent Mark 51 heavy machine gun directors installed for this purpose.)

"It is further suggested that 20mm. guns have proved ineffective against determined suicide planes and that greater protection would be afforded by the substitution of either single or twin 40mm. guns for the 20mm. groups."

(NOTE: On ships carrying 40mm. in quantity this weapon tends to rob the 20mm. of kills. Smoke from adjacent 40mm. also increases the visibility problem. However, ships with only 20mm. automatic weapons and many that have 40's too, continue to make a high percentage of 20mm. kills.)

Air Force, Pacific Fleet--(Capt. F. W. McMahon, Chief of Staff)

"Combining of the factor prohibiting Combat Air Patrol from entering a certain radius from the center of the fleet disposition, with maximum employment of all AA. guns available. Greater usage of 5-inch Mark 32 ammunition when these conditions maintain."

DesRon 55--(Comdr. A. E. Jarrell, Commander)

"The ship being attacked is its own best defense, since it does not have a difficult deflection problem. Other ships particularly should avoid harassing the ship under attack by nearness of friendly gunfire. Heavy and early

ANTIAIRCRAFT ACTION SUMMARY

gunfire from the ship being attacked and nearby ships often results in the plane's withdrawal, if it is not destroyed, for a later attempt from another sector. Jap pilots, even suicide pilots, prefer to attack a ship that is not firing at them to one that is making it hot. Even fanatical suicides want their deaths to bring definite results."

USS PORTLAND--(Capt. T.G.W. Settle, C. O.)

"Early gunfire to point out the plane and force him to hurry or sheer off.

"Automatic weapons fire is not able to stop these planes once the final approach is started.

"Five-inch fire is not noticeably effective due largely to the evasive action of the attacking plane.

"For low-flying targets employ a fixed barrage placed at 5,000 yards."

(NOTE: Early gunfire is an essential. Automatic weapon fire has been effective in about 57 percent of the suicide dives. The Mark 37 type director system suffers at close range when evasive action is taken. Shift should be made to other forms of control. The lethal area of a 5-inch VT fuzed projectile is some 50 times that of a 40mm. bullet.)

USS KITKUN BAY--(Capt. A. Handley, C. O.)

"Experiment with converging or diverging boresight patterns on AA. weapons.

"Make similar research with range setting and deflection devices.

"Try the elimination of all tracer and all 5-inch except Mark 32 or similar marks to deny pilot the knowledge of where the AA. is and relieve gunners of the confusion of many bursts which tend to hide the plane, particularly at twilight. Tracers did not appear to assist our own gunners, and many guns apparently fired at 5-inch bursts."

(NOTE: The optimum pattern of AA. weapons varies greatly with the control, the weapon, the ammunition and the action of the target. It is under constant study...Tracerless 40mm. and 20mm. are available in the fleet. VT fuzes have no tracer. If the control is adequate the suggestion has considerable merit, although there is an undeniable psychological effect of tracers, both on the gunner and the attacking pilot.)

USS MONTPELIER--(Capt. H. D. Hoffman, C. O.)

"The most basic elements of defense against this attack are:

"(a) A heavy 5-inch barrage to prevent careful positioning for dive and

COMMENTS AND RECOMMENDATIONS

in hope that even if direct hits are not obtained, structural weakness may be caused.

"(b) A withering fire from the 40mm. as soon as the plane comes within range."

USS BLESSMAN (APD 48)--(Lt. (jg) D. A. Dollar, Gunnery Officer)

"Since this vessel mounts guns which are only controlled by lead-computing sights it is proposed to use the following systems of control for the various batteries:

"(a) The 5-inch battery (one Mark 30 mount)--Full automatic Mark 51-3 director control using only Zone 2 and 4 barrages, utilizing a three-to-one Mark 40 to Mark 18 fuze ratio. Longer barrages cannot be seen and might confuse large firing ships.

"(b) The 40mm. battery (three twin mounts)--Full automatic Mark 51-2 director control. Range will be set at 2,400 yards when fire is opened and be reduced by detent clicks to minimum, during the firing, with the emphasis being placed on reaching the minimum setting quickly as well as smoothly. It has been observed that too frequently 'smoothly' is interpreted to mean 'slowly'.

"(c) The 20mm. battery (six Mark 10 mounts)--Full Mark 14-6 control. Range will be set at 1,200 yards while the first magazine is fired and will be changed to 400 yards while the magazines are being shifted. Since the 20mm. guns are the last batteries to open fire, they are under a serious handicap. The sky is filled with bursts and tracers making even the location of the target difficult. The din is terrific and the personnel tension is high. It is felt, therefore, that this simple system will be more reliable and produce more hits."

(NOTE: Proposed doctrine of AA. control appears excellent because of its simplicity.)

USS MISSISSIPPI--(Capt. H. J. Redfield, C.O.)

"The ship's doctrine has been revised to keep all (four) 5"/25 guns on a side and at least one sector of 40mm's pointed into the sun at all times."

USS ABNER READ--(Comdr. A. M. Purdy, C.O.)

"It is believed that the 5"/38 and 5"/25 batteries are the only weapons that surface vessels possess which offer any promise, by total destruction of the plane at a respectable range of stopping this type of attack. Using Mark 32 fuzed projectiles, and with the accurate direct fire or line of sight barrage which the present 5-inch fire control installations are capable of, four or more 5-inch guns should offer a high probability of effective hitting outside of 1,500 yards range.

ANTIAIRCRAFT ACTION SUMMARY

"I do not know to what extent the destroyers attacked used Mark 32 fuze projectiles, nor do I know the relative accuracy of the 5"/38 fire control. However, I in no case saw a defending ship obtain a truly destructive 5-inch hit. ABNER READ, in the morning, obtained one 'close' Mark 32 5-inch hit on the plane diving on CLAXTON, but it merely set it on fire; it did not disintegrate it. In the afternoon attack on ABNER READ, although Mark 32 fuze projectiles were used, main battery control was very late in getting on target as a result of their previous tracking of the second (rather than the diving) plane. Consequently, when the main battery opened fire the director was in 'slew sight control' and the computer was set for a 'dive barrage' (advance range set to 2,300 yards). Advance range may have been inside the minimum range of Mark 32 fuze projectiles."

USS FRANKLIN--(Capt. J. M. Shoemaker, C.O.)

"The best defenses would appear to be, first, interception at considerable distance from the force before the fast run is started, and second, a very heavy volume of fire, particularly 40mm. fire. In one instance the control surfaces of the plane were destroyed by AA. fire before it could reach its target and the plane tumbled into the water short of its mark. In several other instances it is believed that heavy fire by 40mm. so damaged the plane as to destroy the accuracy of the dive.

"The 5-inch battery was not used as its effective range in the initial attack because of friendly fighters near the targets. However, 5-inch batteries should be used irrespective of the friendly planes because of the effectiveness of this type of AA. fire in destroying the attacking planes or of at least bouncing them about to such an extent that their flying control, hence aim, will be poor."

(NOTE: The problem of when AA. should commence in the presence of friendly fighters varies considerably with the situation. Paragraph 4561 of USF 10A has a general prudential clause covering this. Fighter pilots should be briefed carefully on the effect of VT fuzes and warned to keep clear of the trajectory by at least 100 yards.)

USS MONTPELIER--(Capt. H. D. Hoffman, C.O.)

"In this ship it is believed that a mistake was made in attempting to set up target angles and speeds in order to get a 'solution'. The 5-inch battery tracked on the approach, but throughout the period when the enemy indulged in aerial acrobatics it was at a loss to take effective action to make any particular setup. It is impossible to do so on a target engaged in violent acrobatics. It is considered that this target is analogous to a 'surprise burst', with the burst represented by a rain cloud over the formation. Therefore, if target angle and speed are discarded and the cloud considered a gigantic 'burst', an overwhelming volume of 5-inch fire appears to be the answer. In his acrobatics within the cloud, sooner or later the Nip is bound to 'walk into' a burst.

COMMENTS AND RECOMMENDATIONS

"It is fully realized that with all ships concentrating on a target at the center of the formation there is danger of fragments hitting own ships. The responsibility therefore which is placed upon a commanding officer is naturally a deterrent to opening fire. Yet if fire is withheld on a determined enemy intent upon a suicide crash dive, the graver consequences of a badly damaged ship will result."

(NOTE: In the situation described attempts at computer solution are futile. Higher probability of hitting is obtained by use of the machine gun directors, or slew sight control, with VT fuzes.)

Dispositions, Speed, Maneuvers

TransDiv 103--(Comdr. W. S. Parsons, Commander)

"It is believed that the best defense against suicide attacks is the closest, tightest possible formation with a single circle of screening vessels equally spaced. Screening vessels should be about 1,000 - 1,500 yards from nearest ships screened with 1,000 yards between screening units."

DesDiv 48--(Capt. J. B. McLean, Commander)

"Certainly one of the best defensive measures against dive and suicide bombers is the use of high speed and turn movement.... It is recommended that formation speed of a force composed of heavy ships should always be increased to the maximum available to the slowest heavy ship when air attack is imminent and that turn movements be initiated prior to the moment that any plane can reach a release or dive point and continued during the attack."

"Fifteen hundred to 2,000 yards from nearest heavy ships is the distance stipulated by USF 10-A for the antiaircraft screen. I believe this still remains the best distance. It allows room for individual maneuver and offers mutual protection by gun power between heavy ships and the screen. A destroyer that is too close to the heavy ships loses its defensive advantage of speed. If over 2,000 yards from the heavy ships it loses much of the heavy ship gun power assistance and becomes a good target for suicidal planes."

USS MANILA BAY--(Capt. F. Lee, C.O.)

"The antiaircraft dispositions in these instances appeared to be quite effective and consisted of an inner circle of carriers surrounded by a single screening circle of heavy ships, with destroyers on the chords between heavy ships. In the suicide attacks of 4 and 5 January in the Lingayen operations a 4R-0 disposition was used as the Victor (antiaircraft) disposition. Carriers were disposed on the 2.5 circle, heavy ships on the 3.5 circle, and an out screen of 27 destroyers were equally spaced on about circle 7.....

"It is suggested that if such large numbers of destroyers are present the two-circle Victor disposition be used, with heavy ships and destroyers on a tight circle around the carriers, and with extra destroyers as pickets on

ANTIAIRCRAFT ACTION SUMMARY

Circle 17 or 18. This would permit heavy ships, with their comparative wealth of AA. armament, to have a clear range and a firing angle of about 200 degrees, while the destroyers on the chords with lesser armament would still have a clear angle of about 160 degrees. The pickets would provide an excellent warning net against low-flying attacks, and could profitably be used in visual fighter direction of the anti-snooper patrols protecting our own main body."

USS PORTLAND--(Capt. T. G. W. Settle, C.O.)

"Maneuvering the ship by radical use of speed and rudder. In this, due consideration must be given to the effect on the gunners of the following:

- "(a) The smoke resulting from a sudden and radical increase in speed.
- "(b) Continuous circling of the ships results in the AA. directors, which are following or searching for the target as the ship turns, becoming 'wound up' and eventually being checked against the train stop. This results in a shift to local control while the director slews around to unwind itself, locate the target anew and repeat the process.
- "(c) The more difficult footing afforded to ammunition passers and gun crews while the ship is in a violent turn.

"Maneuver to keep the 5-inch guns bearing and to avoid attack, but not the point where tracking the target becomes impossible to the 5-inch directors."

USS KITKUN BAY--(Capt. A. Handly, C.O.)

"Test the value of a very tight screen, possibly with escort vessels closing to 200 yards upon Red alerts, to concentrate firepower, bolster morale, reduce deflection and reduce the masking of fire when low attacks fly between ships..... Place OBP's in the center of CVE formations."

Task Group 77.4--(Rear Adm. T. L. Sprague, Commander)

"A tip for the officer at the conn of vessels subjected to this form of attacking is that Japanese aircraft in general become extremely stiff on the controls at high speeds. Any maneuver which will require the pilot to attempt to increase his angle of dive will improve the chances of a miss. If the hit is forward and the ship is headed into the wind a turn to the left should be made to clear fire from the island."

DesDiv 120--(Comdr. J. C. Zalin, Commander)

"The Jap pilots appear to favor attacks on detached ships where fire power is less than can be brought to bear by a formation. It is suggested, therefore, that wherever possible at least two ships be sent together on all detached missions in order to increase AA. fire power and provide a less attractive target than that of a single, unsupported unit.....

COMMENTS AND RECOMMENDATIONS

"It is believed that 1,000 to 1,500 yards between screening ships is ample for evasive maneuvering and, where possible, the distance between stations should not be greater than this during an air attack."

Task Group 38.4--(Rear Adm. Ralph Davidson, Commander)

"The maneuver of placing a single diver abeam appears best for two reasons:

"(a) It presents a narrow target in range;

"(b) It affords the best bearing for volume of antiaircraft fire."

USS CHANDLER--(Lieut. F. M. Murphy, C.O.)

"It is deemed advisable to head into the wind or sun and increase speed when attacked by suicide planes. It was noted that many suicide planes missed down wind. Speeding up and heading into the wind may help in some cases. Turning into the sun may blind a low-flying pilot."

USS WICHITA--(Capt. D. A. Spencer, C.O.)

"The formation must maneuver at high speeds to present the minimum target and to keep the sun on disadvantageous bearings for the attackers."

USS KALININ BAY--(Capt. J. B. Williamson, C.O.)

"Maneuvers to flatten out the attacking planes' dives will be effective."

USS ABNER READ--(Comdr. A. M. Purdy, C.O.)

"One other measure which may be taken for defense against suicidal attacks is the use of speed and rudder. If the heavy units of the formation remain on base course at 10 knots, station keeping for the screening destroyers at 25 knots becomes so difficult that there is a great temptation to slow. But ships' speed must be maintained at a maximum and constant rudder used if they are to have any appreciable effect in causing a diving Val to miss. Circling at high speed by all units of the formation has been used in the past with success, and is the recommended procedure."

Training

USS MONTPELIER--(Capt. H. D. Hoffman, C.O.)

"Against suicide dive attacks a high volume of well-controlled 40mm. fire is the ship's life insurance.

"Intensive training and indoctrination of machine gun and director personnel is a requisite. The following training devices proved to be exceptionally useful:

ANTIAIRCRAFT ACTION SUMMARY

"The Mark 1 Trainer (Bishop's Hat) -- to impress gunners and director operators with the need for smoothness in tracking and to develop ability to do it.

"The Mark 3 Trainer -- to develop teamwork in operation between gunner or director pointer and the sightsetter, and to practice the procedure of picking up targets quickly, developing a good track, followed by firing and spotting and shifting to new targets."

Air Force, Pacific Fleet--(Capt. F. W. McMahon, Chief of Staff)

"Continued training and practice in the use of all AA. firepower against all types of targets" is recommended, including "greater usage of drones in training for high angle dive defense."

USS KITKUN BAY--(Capt. A. Handly, C.O.)

"The best attempt to train was a number of simulated surprise attacks conducted by our embarked planes which afforded our gunners, lookouts and CIC personnel an opportunity to improve their alertness making dry runs. These drills were effective, but did not enable us to stop the last attack.....

"It is suggested that immediate research be pursued along the following lines by appropriate activities:

"Develop a target for realistic gunnery exercises. This could be a water fillable bomb with a target sleeve attached, and containing a radio-controlled device to explode the bomb harmlessly before it could strike the firing ship after being launched by a dive bomber. Radio-controlled gliders or drones, similarly equipped, would be still better."

USS WASHINGTON--(Capt. R. F. Good, C.O.)

"The major defect in defense against suicide plane attack is inability to identify and get on the target while there is still time to put up fire of effective volume and accuracy. Concentration on training of lookouts and fire control teams by conducting all recent antiaircraft target practices as 'surprise' practices, has produced some improvement and may be expected to produce more. The addition of IFF reception to AA. fire control radars is, however, an item of urgent necessity."

Task Unit 79.3.2--(Capt. S. P. Jenkins, Commander)

"The real defense to these attacks would seem to be accurate gunnery. It has been suggested that the suicide planes can withstand phenomenal punishment. That may be true, but no plane, however armored, can withstand the withering barrage that we can give. On the two occasions on "S" day when the Jap planes appeared in Lingayen Gulf our gunnery left much to be desired. There is indicated an immediate need for more intense training of all gunnery personnel, supplemented with special training for all lookouts on the probable methods of approach and attack."

COMMENTS AND RECOMMENDATIONS

Task Group 38.4--(Rear Adm. Ralph Davison, Commander)

"Every opportunity for exercising at repelling this type of attack should be taken by conducting drills with our own planes."

USS SOUTH DAKOTA--(Capt. C. B. Momsen, C.O.)

"It is believed that valuable training could be obtained at sea by better utilization of routine dawn and dusk periods at general quarters. To provide suitable targets for antiaircraft tracking, it is suggested that arrangements be made for routine simulated torpedo plane and dive bomber attacks during the periods from one hour before sunrise to sunrise and from sunset to dark. Planes should keep running lights on during darkness to permit tracking with automatic weapons. These routine exercises would, of course, be cancelled when in areas where enemy attacks are expected or when interference with launching or recovery of strikes might occur."

USS BOSTON--(Capt. E. E. Heerrmann, C.O.)

"Emphasis recently placed by CincPac and the fleet and task force commanders on the matter of training makes it evident that this requirement is nowhere underestimated. On the other hand, it is felt that the desired emphasis on antiaircraft training still lacks by a large margin the implementation necessary to effect it. Ample opportunity does occur in the normal course of operations to conduct practically all varieties of non-firing training, and these opportunities are fully exploited. Opportunities for actual firing are, however, very limited, and in the opinion of the commanding officer do not as yet even closely approach the requirements for gaining from our batteries their full capabilities. It is especially true of the automatic weapons batteries that only actual firing will ensure the development of techniques which are absolutely essential to the successful use of the fire control equipment of these batteries. Steady tracking under the shock and vibration of gunfire, familiarity with the problems created by muzzle smoke, and a ready response to fire discipline under firing conditions, are qualities of paramount importance in the automatic weapons batteries which can be attained to a satisfactory degree only by actual firing.

"An analysis of the BOSTON'S experience during the three months preceding the termination of the present operation (23 January) shows that during this time there were 6 firings, during which this ship participated in a total of 46 firing runs. The average numbers of firings for individual mounts during this 3-month period were: 5-inch - $3\frac{1}{2}$ per mount; 40mm. - $2\frac{1}{3}$ per mount; 20mm. - $1\frac{1}{2}$ per mount. In the automatic weapons batteries the averages are less than required to give each of the 3 condition watch crews one firing per quarter, and in the 5-inch battery this low standard is barely made. The BOSTON during this time pursued and stretched every opportunity to fire, and it is felt that its experience probably lies on the high side of a more general average.

"Failure to net a better return from the emphasis placed by CincPac and the fleet and task force commanders on this type of training has resulted, it

ANTIAIRCRAFT ACTION SUMMARY

is believed, from failure, (1) to accord such training adequate priority during operating periods, and (2) to furnish towing equipment on a large enough scale. With a few exceptions, firing periods have been confined to periods just preceding entry or just following sortie. These are appropriate periods, but they fall short of providing adequate time for firing; they are often cut short by other business associated with sortie and entry. The rare opportunities for firings during the operations themselves are usually characterized by relatively early loss of towing services due to faults in the towing gear and lack of replacement planes.

"Whatever emphasis on AA. training may have been warranted heretofore deserves now to be doubled and redoubled. The recent trend of enemy aircraft tactics points clearly to a need for the utmost in fire power from our AA. batteries. It is submitted that our AA. batteries, and particularly the automatic weapons, are now delivering, in the average case, only a small fraction of their potential power. This fraction has often been sufficient to turn away an attack, or to knock down planes committed to a conventional bombing or torpedo attack; it has usually been insufficient to stop the suicide attack. The latter demands a large measure of increase in hitting; this increase is available and requires but to be extracted by increasing the proficiency of our gunners.

"It is submitted that no substantial increase in AA. firing training will be forthcoming until this training is assigned commensurate time in its own right; in other words, until it is scheduled as a 'must' in the same sense that fueling, provisioning, aircraft replacement, flight training, etc., are so scheduled. At the time the BOSTON was attacked on 21 Jan., none of its AA. guns had fired in over 3 weeks, and all of its port 20mm. guns and most of its port 40mm. guns had not fired in over two months; it is taking too much for granted to expect batteries so long out of firing to hit and hit hard in the few seconds they may have to knock out a suicide attacker. It took too long to knock this one down.

"In order to increase training opportunities during the course of an operation, it is proposed that time for the same should be scheduled approximately as often as fueling is scheduled, probably the fueling days themselves could be used to partially fill this need, but if not, it should be recognized that the need still exists and time allowed to meet it. To permit full utilization of time that becomes available, it is proposed that the regular carrier complement of planes equipped for towing should be radically increased, not to do so is poor economy, for it will inevitably result in a decrease of combat planes available due to increase in damage to carriers. It has been proposed elsewhere that towing services might be furnished during fueling periods by CVE's, this might indeed prove to be very profitable employment for one of these vessels.

"The menace of the suicide attack, developed into multiple and perhaps massed attacks, is great enough to warrant unusual and drastic measures to bring our AA. batteries to a peak of efficiency which has heretofore rarely been achieved. Our AA. batteries are coming to closer grips with the enemy than ever before, and their steel needs sharpening!"

COMMENTS AND RECOMMENDATIONS

(NOTE: The subject of training requires continued emphasis. There is no new development in AA. weapons in sight that will approximate the increase in AA. effectiveness that is presently available by adequate training of the crews with the weapons they now have.)

Lookouts and Recognition

USS MONTPELIER -- (Capt. H. D. Hoffman, C. O.)

"There is no substitute for well-drilled, well-disciplined and alert lookouts."

USS MISSISSIPPI -- (Capt. H. J. Redfield, C. O.)

"It is felt that in view of the demonstrated Japanese suicide tactics the importance of sun lookouts cannot be overemphasized.... The chance of an enemy plane 'getting by' a lookout in a sector not handicapped by the sun is considered remote as compared with the chance of such a plane sneaking in from the sun sector. Furthermore, a mistake in failing to pick up a plane of the former type tends rapidly to be rectified as the plane approaches, while in the case of a plane coming in from the sun it is possible for the plane to continue undetected until it is almost on top of the ship. Thus, the greater the number of sun lookouts, and the less the time required to get guns pointed and trained into the sun, the better will be the chances of the individual ship against this type of attack."

Task Group 38.4 -- (Rear Adm. Ralph Davison, Commander)

"As a defense the following measures are suggested:

"Increasing the alertness of our visual lookouts and insuring prompt transmission of their sighting information to the batteries.

"Increasing the alertness of the gun and director crews."

DesDiv 120 -- (Comdr. J. E. Zahm, Commander)

"The continued success of Japanese suicide planes in achieving their goal presents the most critical problem of unit defense at the present time. The first step in solving this problem is, of course, alert, trained lookouts. Too frequently fire has been opened at ranges under 2,000 yards."

USS PENNSYLVANIA -- (Capt. C. F. Martin, C. O.)

"The performance of the sky lookouts, both condition watch and general quarters, again merits the highest praise. Enemy planes were picked up and identified at extreme visual ranges. In some instances this was done early enough to warn the fighter director units of their presence and to vector the combat air patrol to the enemy planes prior to their attack. The results achieved by sky lookouts, control parties and gun crews are considered exceptionally good."

ANTIAIRCRAFT ACTION SUMMARY

USS KADASHAN BAY -- (Capt. R. N. Hunter, C. O.)

"Plane recognition has been stressed in the past four months and classes have been held for all gun crews. The recognition officer was placed in charge of the lookouts and has given particularly intensive drills in recognition and also training as lookouts. Their work has been excellent. Nevertheless, when the plane hit the ship there was considerable diversity of opinion as to whether the plane was a Zeke or Oscar."

AA. And Fighter Defense

Air Force, Pacific Fleet -- (Capt. F. W. McMahon, Chief of Staff)

"Define limits at which Combat Air Patrol must break off pursuit and allow ships' AA. fire to take over attempted destruction of a target with no fear of interference, or prohibitions to the use of 'influence' type projectiles, because of friendly planes mixed in with bogeys."

USS KITKUN BAY -- (Capt. A. Handly, C.O.)

"Enforce with a shoot - regardless policy, a doctrine prohibiting friendly pilots from making any but the prescribed approach to a formation of ships. Time cannot be wasted on positive identification."

Task Group 38.4 -- (Rear Adm. Ralph Davidson, Commander)

"Increase the Combat Air Patrol and station the additional divisions out a short distance from the task group, where they may themselves act as lookouts to catch the attacker in his glide, and at the same time be clear of our antiaircraft fire."

USS VINCENNES -- (Lt. (jg) R. A. Johnson, Fighter Director)

"It is believed that when raids actually get within gunnery range, all friendlies must be ordered away from the formation from the standpoint of the safety of the planes and also to clarify the gunnery situation. This was done almost immediately during the attacks but it clouded the screen even more at ranges from 10 to 35 miles."

USS HOGGATT BAY -- (Capt. J. A. Briggs, C. O.)

"During every attack made on ships of this formation the presence of friendly aircraft around and over the formation was noted contrary to the instructions contained in the operations order which provided that upon the sounding of 'flash red' friendly planes were to vacate the area and not approach within a minimum slant range of 10,000 yards from the formation. The presence of friendly planes during said attacks, who were obviously not in pursuit of enemy planes, invariably distracted control personnel and the gun crews from making more accurate observation of approaching enemy planes and created a situation which could have been disastrous. However, if attacks occur during launchings, obviously, friendly planes will be in the vicinity."

COMMENTS AND RECOMMENDATIONS

USS ESSEX -- (Capt. C. W. Wieber, C. O.)

"That a small, short range, wide beam search radar be provided to locate intruders near but not visible to the dispositions; that this radar be operated by the gunnery organization; and that carriers be given priority of installation in the event that this recommendation is approved. SN or SQ radar is suggested as an idea as to size and type of operation."

Task Group 38.4 -- (Rear Adm. Ralph Davidson, Commander)

"A thorough short range radar search inside a general melee."

Air Force, Pacific Fleet -- (Capt. F. W. McMahon, Chief of Staff)

"To possibly employ AI gear, or other airborne search and intercept radar when cloud cover is intense, or other elements obscure visibility and make establishment and maintenance of visual contact difficult....."

"Constant maintenance of both radar and visual control over our returning aircraft to such an extent that there can be the least possibility of allowing bogeys to infiltrate with them undetected."

DesDiv 48 -- (Capt. J. B. McLean, Commander)

"Destroyers should always be in condition One Easy in landlocked waters where air attacks are frequent and early warning not always possible. This condition is not a hardship for a destroyer if properly organized and it is recommended that the senior destroyer commander present be enjoined by directives to enforce this as a rule."

USS MINNEAPOLIS -- (Capt. H. B. Slocum, C. O.)

"As soon as the landing forces succeed in setting up their shore radar installations, enemy planes no longer approach dangerously close to our formations without the ships being appraised of their approach. It is the interim period between areas for bombardment and landing operations, and the time shore-based search radar installations are put into operation that our ships are in most danger."

"As a method for providing an effective early warning search during this interim period the following suggestion is offered for consideration. It is suggested that a number of large aircraft, such as the PBY or PBM, be equipped with this radar would patrol in the vicinity of ships and keep the CIC's informed of the approach of all bogies, giving frequent bearings and ranges for plotting purposes. It is conceivable that a fighter direction team could operate in the plane."

USS PENNSYLVANIA -- (Capt. C. F. Martin, C. O.)

"A new and additional duty was placed on the VO aircraft attached to this ship. These planes were used as picket aircraft over land where this ship's

ANTIAIRCRAFT ACTION SUMMARY

radar experienced difficulty in picking up enemy planes. On two occasions these planes reported enemy planes headed for the formation. This is considered excellent usage, when planes are so available, particularly when ships are operating in landlocked waters."

USS SUWANNEE -- (Capt. W. D. Johnson, C. O.)

"The greatest difficulty in intercepting bogeys was found to be the lack of altitude information. This occurred because:

- "(a) Ships operating as close as 30 miles to large land masses resulted in the radar screen being blocked up to 180 degrees.
- "(b) Failure of actual 'fitting' fade charts in use were constructed and based on many radar calibration runs.

"The second serious problem presented during most 'close-in' interceptions was the large numbers of friendly planes (singles and groups) in the area. Many 'tally-ho's' were made on ASP planes and returning strike groups of this diversion and other carrier divisions in the vicinity; during this time the bogeys either faded or opened.

"Recommendations:

- "1. There should be some type of SM radar on each carrier, or at least on one carrier of each division.
- "2. The carriers should operate at least 75 miles from large land masses.
- "3. Local CAP should be increased from eight to 12 planes in the bogey area."

CruDiv 12 -- (Rear Adm. R. W. Hayler, Commander)

"During the whole operating period, repeated air attacks made heavy demands on antiaircraft fire control and air search equipment. This equipment generally performed as well as its present limitations permit. Two inherent limitations of air search equipment acted as handicaps to our air defense:

(1) The inability to track planes over surrounding land masses, and (2) the inability to follow planes that are in 'fade' zones of the antenna patterns. Possibly a part of the effectiveness of the enemy's suicide dive attacks is due to his approach in a gliding dive from high altitudes, remaining for long (and critical) periods within these 'fade' zones."

USS WASHINGTON -- (Capt. R. F. Good, C. O.)

"The major defect in defense against suicide plane attack is inability to identify and get on the target while there is still time to put up fire of effective volume and accuracy. Concentration on training lookouts and fire control teams by conducting all recent antiaircraft target practices as 'surprise' practices, has produced some improvement and may be expected to

COMMENTS AND RECOMMENDATIONS

produce more. The addition of IFF reception to antiaircraft fire control radars is, however, an item of urgent military necessity."

USS MOBILE -- (Capt. C. C. Miller, C. O.)

"The problem of radar tracking of high altitude planes was emphasized by this action. It was found impossible to track three out of the four enemy planes fired upon, and the fourth (the one that did not dive) was not tracked until picked up at about 18 miles. In general, it can be stated that the SK radar is inadequate to cope with high altitude (20,000 to 25,000 feet) enemy planes. Bogeys are detected at 30 to 35 miles, then promptly fade. They may reappear at close ranges, but more often they do not.

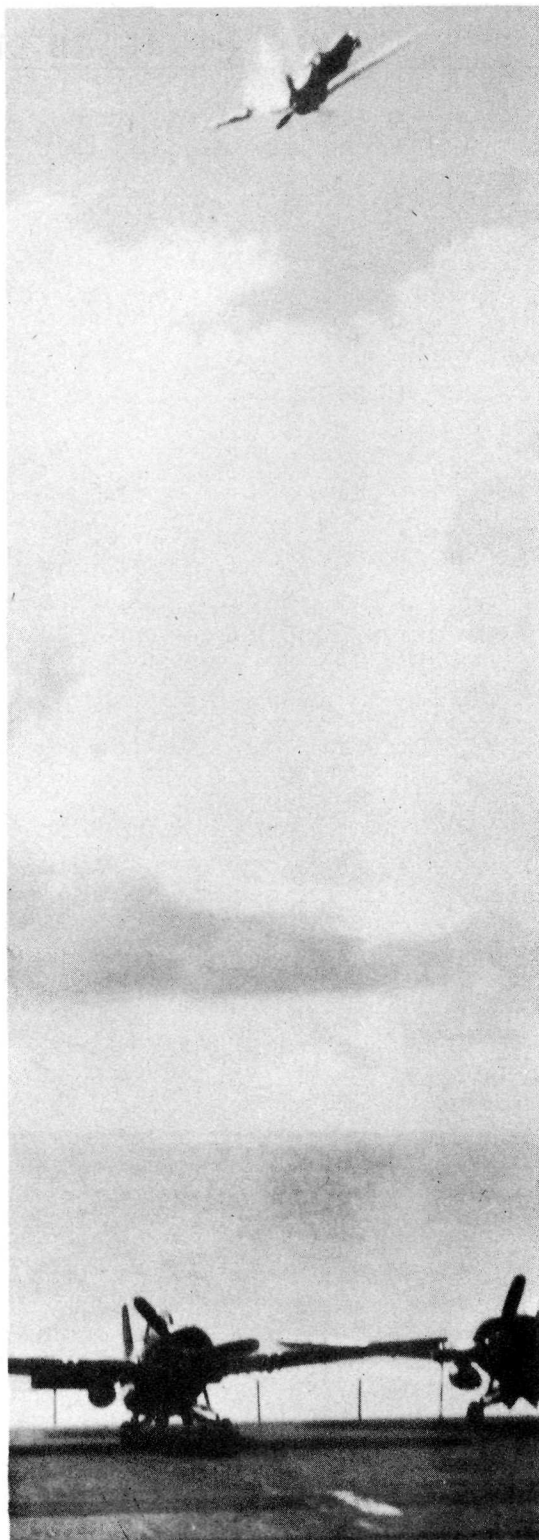
"Until a better solution for the problem, possibly in the form of re-designed radar equipment, is available, it would appear that the present answer is a combination of a vigilant CIC watch, prompt reports by all ships to the task group fighter director, early investigation of all bogeys by the CAP, and alert lookouts."

Task Unit 77.4.1 -- (Rear Adm. C. T. Durgin, Commander)

"While operating in close waters with our present radar and with the small number of fighters available for local combat air patrol it would seem that it is impossible to stop all of the suiciders from getting through to attack. A height-finding radar aboard at least one ship of each division would ultimately lead to more interceptions."

USS MORRIS - (Lt. Comdr. R. V. Wheeler, Jr., C. O.)

"The search, though difficult, was still effective; but the problem of coaching gunnery control on a target was increased to a degree entirely out of proportion to the difficulties encountered in detection. The presence of shipping in unprecedented concentrations, high land masses, and second sweep land echoes made the FD operator's job an extremely difficult one. Where the plane was high over either land or water, combat was able to coach control on target with customary dispatch, but when the plane was at low to moderate altitudes results were most unsatisfactory. Only in occasion when the target angle was 000 or 180, and the resultant high range rate was present, could the plane's echo be determined by the operator. However, it is felt that FD radar ranges could have been used more often on some of the air targets. Additional training under difficult conditions is needed."



Zeke, with tail and part of wing shot off by AA. fire, before crashing astern of the PETROF BAY (CVE-80) on 26 October.

CHAPTER VIII

ANTI-SUICIDE TRAINING

Suicide attacks have stressed the need for intensification of AA. training in the Fleet. The suicider is a problem that only top-notch gunnery can defeat.

Advanced training is required in these main directions:

- (a) Detection and acquisition of targets on dry runs.
- (b) Effective use of weapons against fast maneuvering targets at short range.
- (c) Continued emphasis on long range AA. gunnery.

Failure to detect suicide planes until they arrive in attack position has been one of the chief AA. difficulties. Training can best be accomplished by use of own attack groups. Such exercises too frequently take a form for exercise of the air group concerned in U. S. tactics of mass coordinated attack. For AA. training of a task group a small, well briefed, attack group should be designated which makes every effort at concealment of their approach and evasion of friendly CAP.

Extensive exercise in the short range problem is required. The small TDD drone which is available now to certain Fleet units provides excellent training in this phase. Self-imposed restrictions to add to the realism and give simulation of surprise attacks are essential.

Emphasis on effectiveness of long range AA. fire must not be reduced, as dropping the plane beyond reach of the force is unquestionably the most sure solution to the AA. problem. Again realism is required. The bulk of such training must be accomplished with sleeve targets. When large drones are available full advantage should be taken of their ability to take evasive action.

Lookouts and Recognition

Because of the surprise nature of suicide attacks, the importance of lookout training has increased greatly. Training should emphasize alertness and concentration of search in own sector during action in other sectors.

Since radar search is weakest at high angles and in the direction of land, these areas, as well as the sun, should receive special attention from lookouts. At dawn and dusk the dark horizon is the most likely direction from which attacks will appear.

Besides special sky lookouts, at least two members of each gun crew should be designated as lookouts. Rotation of lookouts to prevent fatigue and maintain search efficiency should be standard practice.

ANTIAIRCRAFT ACTION SUMMARY

A March ALPAC pointed out that action reports dealing with suicide attacks indicated commanding officers were not stressing identification training and recognition sufficiently. ComSeventhFleet informed ships under his command that to reduce damage by suicide planes and to safeguard friendly aircraft, identification improvement was imperative.

Recognition officers are on board all combatant ship of DE-60 size or larger, and on many auxiliaries. They also are available on some staffs, at AATC's, in navy yards and elsewhere ashore. These should be utilized to the maximum extent to train personnel in recognition and identification, including identification tactics and procedure prescribed for our own aircraft.

If recognition officers are not available aboard ships every opportunity should be taken to send lookouts and gun crews to recognition training courses at shore establishments. Identification must be accurate and immediate if suicide planes are to be taken under fire at the earliest possible moment.

Personnel Performance

Suicide tactics not only nullify the psychologically-detering effects of AA.; they also place a strong psychological weapon in the hands of the enemy.

Reports from the fleet indicate that although officers and men have the greatest respect for the suicide plane for the most part, they have not permitted the new enemy tactics to decrease their gunnery efficiency.

Several gunners have leaped overboard when a hit on their ships appeared imminent, however. Other have developed severe cases of hysteria and other emotional disturbances after their ships underwent particularly violent attacks.

Personnel aboard ships which have been sunk by suicide planes are most affected. The immediate reaction is to seek duty on ships which are thought to be less vulnerable to this form of attack.

The potential adverse psychological effect of suicides upon gunnery should not be underestimated. It can be forestalled or overcome by wise leadership devoted to instilling confidence in personnel.

Following are suggestions for building and maintaining moral:

1. Assign duties to occupy each individual before, during and after an action and convince him of their importance. Hysteria will not develop if a person is busy and faced with definite responsibilities before, during and after an action.
2. So indoctrinate men in their assigned duties that they do them almost automatically in an emergency.
3. Convince gunnery department personnel, through movies, lectures, etc., that a suicide plane will fall if accurate fire is continued until the target appears to be "coming down the barrel of the gun".

ANTI-SUICIDE TRAINING

4. Imbue in personnel a hatred of suicide pilots which will inspire aggressiveness and supreme courage on the part of the gunners.
5. Assure personnel that their very lives depend upon their best performance, and that the suicide problem resolves itself into one of "kill or be killed"!



Jap suicide plane hit while diving on USS NATOMA BAY (CVE-62)



Jap suicide plane trying to crash USS NATOMA BAY (CVE-62) after being hit.



Jap suicide plane crashing in water just aft of USS NATOMA BAY (CVE-62)