~~CONFIDENTIAL~~ UNCLASSIFIED

OFFICE OF THE SECRETARY OF DEFENSE
WEAPONS SYSTEMS EVALUATION GROUP
Washington 25, D.C.

WSEG STAFF STUDY NO. 4

15 August 1951

OPERATIONAL EXPERIENCE OF FAST CARRIER TASK FORCES IN WORLD WAR II

OFFICE OF THE SECRETARY OF DEFENSE
WEAPONS SYSTEMS EVALUATION GROUP
Washington 25, D. C.

15 August 1951

OPERATIONAL EXPERIENCE OF FAST CARRIER TASK FORCES IN WORLD WAR II

TABLE OF CONTENTS

ENCLOSURES

I.

INTRODUCTION

1. The fast carrier task force was a development of World War II. Before that conflict, the three leading naval powers had worked out the techniques of operating aircraft from specially constructed ships, but their role in naval warfare had not been determined. The most successful of the belligerents in solving the problems involved was the United States, whose fast carriers played an important part in the war in the Pacific.

2. Study of the effectiveness of carrier task forces in the future requires as a starting point an understanding of the factors affecting their operation in the past. From this should develop certain measures of effectiveness under varying conditions. The pertinence of such measures to the future will, of course, be affected by changes which may have occurred in equipment and techniques, in missions assigned, and in the levels and quality of opposition which may be encountered.

3. As a preliminary to evaluation of the effectiveness of carrier forces, therefore, this staff study was prepared within the Weapons Systems Evaluation Group with the assistance of--and from information gathered by--the Aviation History Section in the Office of DCNO (Air).

4. The majority of data in the following historical summary were derived from United States experience from November 1943 through August 1945. This applies particularly to the range of questions concerned with utilization. Loss rates are taken from the whole war experience.

5. The purpose of this general historical analysis is to consider briefly the utilization of carriers and carrier aircraft, to indicate the military effort exerted, to discuss the causes and degrees of loss both to ships and aircraft, and

to measure the general effectiveness of fast carrier forces in World War II. Wherever it appeared pertinent and is available, British and Japanese experience has been called upon to supplement that of the United States. Statistical information basic to an understanding of fast carrier operations is included in Enclosures A through G.

II.

SUMMARY AND CONCLUSIONS

FAST CARRIER TASK FORCE PERFORMANCE

6. During World War II the United States Navy developed and operated fast carrier task forces in the Pacific. They were the principal element in the destruction of enemy naval power, reduced merchant shipping substantially, played a large share in establishing Allied air superiority, and supported a long amphibious campaign. The exigencies of that campaign determined to a large extent the tempo of fast carrier task force operations.

7. The maximum number of days on which the force conducted offensive air operations in any calendar month was 16 in April 1945. If, however, a 30-day period is taken from time of sortie from an advanced base, it is possible to find task groups launching strikes on as many as 20 days during such a period.[1/] Beginning in June 1944, averages for months of more active employment indicate about 10 strike days per month. The number of sorties per strike day varied considerably, but for a series of 3 days followed by a day or 2 for replenishment, 1.5 sorties per complement aircraft per day was representative. Of this effort on strike days, 25 to 30 per cent of sortie effort was defensive: i.e., for the protection of the force. As this burden fell almost entirely to fighters, it resulted in about 35 per cent of fighter sorties on strike days being devoted to defense.

8. Losses naturally varied considerably with the intensity of operation and the character of the opposition. For fighters they ranged from 0.77 to 1.95 per 100 sorties and for attack planes from 0.87 to 2.90. In addition, a certain number of aircraft losses occurred aboard the carriers to

1/ Individual carriers occasionally exceeded this number.

aircraft not in flight either from accidents or as the result of enemy action. These averaged about 4 per cent of the aircraft complement per month.

9. The average fighter carried 0.19 tons of bombs and 2.9 rockets, while the average attack plane had 0.69 tons of bombs and 0.19 rockets. The actual load carried departed from these averages according to the target. The nature of targets and opposition during World War II was such that combat radii employed were relatively constant at about 200 n.m. On occasion, strikes for special purposes were executed at combat radii up to some 350 n.m. Since Japanese aircraft, even of similar single-engine types, were capable of ranges comparable to those of U.S. carrier planes, carrier forces could not escape Japanese air opposition by employing maximum combat radii, hence these ranges were little used.

SHIPS EMPLOYED

10. To achieve these results the Navy operated 21 fleet (CV) and 9 light (CVL) carriers. Three additional CV's were in commission but had not seen action when the war ended. The maximum employed in a single operation was 11 CV and 5 CVL. From experience there evolved the system of dividing a fast carrier task force into task groups each containing from 3 to 6 carriers, with sufficient support vessels to provide an antisubmarine screen, antiaircraft protection, and defense from surface attack. The task group was capable of independent operation and was sometimes so used. A typical group organization was 4 carriers (3 CV, 1 CVL) accompanied by 2 battleships or battle cruisers, 4 cruisers (1 heavy, 3 light), and 16 destroyers. As many as 3 or 4 task groups constituted a fast carrier task force. The following figures are indicative of the degree of utilization of carriers in combat operations.

UTILIZATION OF FAST CARRIERS
IN COMBAT OPERATIONS

Of CV's and CVL's Carriers in Commission	1942	1945	Entire War
Av. percentage assigned for operations	67	59	67
Av. percentage launching strikes on any day	3	14	10

11. Employment of fleet and light carriers in antisubmarine operations, ferrying, and training occurred rarely.

12. Of the 21 CV's actually employed in operations, 4 were lost to enemy action, all in 1942 and of 9 CVL's, one was sunk, this occurring in 1944. Thirty-seven other instances of successful enemy attack occurred: i.e., a carrier was stuck with one or more bombs, torpedoes, or suicide planes. An analysis of damage to fleet and light carriers reveals the following:

EFFECTS OF DAMAGE TO FLEET AND LIGHT CARRIERS

Agent	Percentage of hits requiring repair & overhaul	Weeks in yard per hit*	Weeks out of operation per hit
Submarine Torpedo	100	10**	12.4
Aerial Torpedo	100	10**	17.5
Aerial Bomb	40	0.3	0.7
Kamikaze	70	1.8	4.3

*Time is that for repair of battle damage only.
**Estimate, because information available on the few cases involved is insufficient to distinguish between time for repair of battle damage and other overhaul.

13. Circumstances surrounding losses of carriers, both United States and foreign, indicated that a carrier might be sunk either by sheer weight of attack or by a chance hit which caught the ship in a critically vulnerable condition. When adequate defenses against submarine, surface, and air attack were present it appeared to be virtually impossible for the enemy to accumulate enough hits to sink a carrier by weight of attack. Improved construction and better facilities and training for damage control reduced the extent of damage from hits of all kinds. So long, however, as carriers operated

within range of enemy attack and consequently had at times to maintain their gasoline systems open and at others to have fuelled and armed aircraft parked on hangar and flight decks, there remained a chance of a hit doing fatal damage.

14. Vessels other than carriers in fast carrier task forces suffered light losses and relatively little damage. Only 4 destroyers so employed were sunk, all in 1942, and no battleships or cruisers. During the entire war 6 battleships and battle cruisers, 2 heavy and 5 light cruisers, and 19 destroyers employed in fast carrier task forces were damaged.

LOGISTIC SUPPORT SYSTEM

15. Before World War II the accepted concept of naval operations held that fleets were tied to established bases to which they must periodically return for upkeep, repair, and supply. Had this not been revised the amphibious advance across the Pacific would probably have been impossible. The system of floating logistic support developed during the war and typified by Service Squadrons 6 and 10 largely freed the task forces from the limitations of fixed bases and permitted the fleet to exploit more fully their inherent mobility. While expeditionary forces with their large numbers of troops and quantities of equipment continued to require extensive base construction, as the war progressed fast carrier task forces tended to reduce their dependence on shore facilities.

16. Two principal elements contributed to this development: (1) floating mobile base units established in fleet anchorages, and (2) replenishment at sea. The first consisted of a number of specialized ships and barges for storage and issuance of supplies, for repair of equipment and ships, and as quarters for replacement personnel. Beginning with the attack on the Marshall Islands in January 1944, the fast carrier task force no longer returned to Pearl Harbor between operations, but put into fleet anchorages where it was

replenished by Service Squadron 10. At these fleet anchorages in the Pacific, construction ashore was held to a low level and basically was for the use of local defense forces, although a carrier aircraft pool of 150 to 300 planes, a communications center, small hospital, recreation areas, and fleet post office were usually available.

17. The second element, replenishment at sea, had its origin prior to the war in the development of techniques for the transfer of fuel. Oilers occasionally passed small quantities of other supplies during refueling operations. In February 1944 escort carriers accompanying the oiler group supplied the fast carrier force with replacement aircraft. Accumulating experience led in December 1944 to the establishment of Service Squadron 6 with the express mission of exploiting the possibilities of replenishment at sea. This squadron came into its own during the Okinawa Campaign (March-June 1945) when 3 fast carrier groups remained at sea for 47, 62, and 77 days, respectively.

18. The effort expended for the logistic support of fast carrier task forces cannot readily be ascertained because bases were constructed, and Service Squadrons 6 and 10 were organized and equipped, to support all types of Naval forces and also Army and Army Air forces when required. From October 1944 through May 1945, the fast carrier task forces used Ulithi Atoll as their principal anchorage and it was also the headquarters of Service Squadron 10. Total base construction costs at this anchorage for all purposes amounted to $18,580,273, some of which was expended after the carriers had shifted their anchorage to the Leyte-Samar area. For the Okinawa campaign it is estimated that Service Squadron 10 used 46 ships of the following types to support Task Force 58:

Merchant Tankers	12
Gasoline Tankers	6
Ammunition Ships	8
Fleet Tugs	7
Hospital Ship	1
Stores Ships	6
Destroyer Tenders	3
Barracks Ship	3
	46

19. Service Squadron 6, because it entered areas subject to enemy submarine and air operations, included a certain number of escort carriers and surface escort vessels as well as supply and replenishment ships. For the support of all naval combat forces during the Okinawa campaign, it employed the following:

CL	1
CVE	7
DD-DE	28
Cargo	2
Oilers	24
Ammunition Ships	5
Fleet Tugs	4
Distilling Ships	2
	73

20. Even with the growth of techniques and ability for floating mobile support, the Navy continued to employ land bases for logistic support of fast carrier task force aircraft. At advanced bases, other than those employed exclusively for seaplanes, it established units capable of servicing carrier type aircraft. At various points it also maintained pools of aircraft for replenishment purposes. Late in the war when carrier operating and supporting techniques reached their full development, land pools in forward areas contained about 1500 carrier type aircraft, principally at Guam and Leyte Gulf; while another 300 such aircraft were in the custody of service units, the majority at Saipan. These facilities existed not only for the servicing and replenishment of the 1000 to 1200 aircraft in fast carrier task forces, but also of carrier type aircraft in other forces, such as the escort carriers supporting amphibious forces, Marine Corps units, and Navy inshore patrol squadrons. Just what share of the effort involved went into support for the fast carrier task forces cannot be determined.

AIRCRAFT EMPLOYED

21. Fast carriers employed fighters and attack aircraft. The latter category was composed of dive bombers and torpedo planes. Throughout the war there was a steady tendency to increase the percentage of fighters in carrier complements. There were two basic causes for this development: (1) the need for more adequate air defense; (2) the development of the fighter-bomber, especially notable after the introduction of rockets, which permitted the use of a single type aircraft for both fighter and attack purposes. A summary of this change may be obtained by selecting CV aircraft complements at different dates during the war:

STANDARD COMPLEMENTS OF FLEET CARRIERS, WORLD WAR II

Date	VF		VB/T	
	No.	Percentage	No.	Percentage
February 1942	18	25	54	75
November 1943	36	38	54	62
October 1944	55	56	42	44
April 1945	73	71	30	29

22. The change in complements was reflected in the inventory figures and in the percentages on board carriers of all types assigned to operating forces:

Date	Average number on hand		Average percentage in operating forces at sea including CVE's	
	VF	VB/T	VF	VB/T
Jan-Jun 1942	683	830	14	28
Jan-Jun 1945	12,691	9,728	9	6

23. A typical distribution of on-hand aircraft as of late 1944 was as follows:

Activity	Percentage of Inventory
On board carriers available for fast carrier and amphibious operations	12
On board carriers otherwise assigned	2
Carrier Squadrons, shore-based, in training	16
Shore-based activities, Navy and Marine Corps	25
Training Command	10
Logistic support (pools, pipe-lines, transit, etc.)	35

III.

BRIEF HISTORICAL SUMMARY OF OPERATIONS BY FAST CARRIER TASK FORCES

MISSIONS OF U.S. FAST CARRIER TASK FORCES

24. The missions of the Fast Carrier Task Forces varied in order of importance with the nature of the operation or campaign on which they were engaged. During the war they performed the following:

a. Destruction of enemy naval units and naval installations.

b. Reduction of enemy air power.

c. Protection from air and naval attack on or reinforcement of areas of amphibious and ground operations.

d. Close air support of amphibious and subsequent ground operations.

e. Destruction of enemy merchant shipping.

f. Disruption of enemy lines of communication, with emphasis on seaborne communications.

g. Attacks on industrial and other economic objectives.

h. Defense of United States territory, installations, and military forces.

i. Assistance to, or action in lieu of, other United States military forces as might be directed.

25. Beginning with the invasion of the Marianas in June 1944, escort carriers had as their primary mission the close air support of amphibious landings and subsequent ground operations. This allowed fast carrier task forces to emphasize the isolation of the objective area from air and naval attack or reinforcement. Close air support of amphibious operations then became a secondary mission of fast carrier task forces. In general, they were used for this purpose on each D-day and on such other occasions as the situation required a greater effort than the escort carriers could furnish. The Navy employed its fast carriers chiefly along the lines of a tactical air force but in addition when attack upon strategic objectives was both advantageous and within their capabilities, they were so used.

BRIEF HISTORICAL NARRATIVE

26. The following does not purport to give a complete view of fast carrier task force operations during World War II.[2] It seeks rather to set forth the framework within which the operations took place. From the fast carrier viewpoint, the war fell into 3 periods: (1) December 1941 - October 1942, when the enemy largely dictated the strategy and carriers were operated according to pre-war theories and the exigencies of the moment; (2) October 1942 - August 1943, during which time both sides awaited the commissioning of new ships as replacements for those lost, as well as to increase the size of the carrier forces, and when the United States Navy, especially, trained new carrier air groups; (3) August 1943 - August 1945, the period when the fast carrier task force appeared and reached its full development. The last 2 years of the war may be further subdivided into the period up to October 1944 when the Japanese sought to counter the fast carrier offensive with conventional means, and the period after that date when they increasingly resorted to kamikaze and other tactics of desperation.[3]

27. On 7 December 1941 the United States Navy had 7 fleet carriers (CV) and 1 escort carrier (CVE) on which were embarked approximately 120 fighters and 321 attack aircraft. None of the 3 fleet carriers assigned the Pacific Fleet was at Pearl Harbor when the Japanese attacked. ENTERPRISE and LEXINGTON

2/ More extensive published accounts may be found in The Navy's Air War, New York (1946), and Navy Department, Office of the Chief of Naval Operations, U.S. Naval Aviation Selected Action, and campaigns may be found in Appendices E and F.

3/ Size of Japanese Air Forces is discussed in Appendix A.

were engaged on missions for delivery of aircraft to Wake and Midway, respectively, and SARATOGA was on the west coast. Because of severe damage to battleships the principal task of defense fell upon the carriers. To increase the available strength the Navy shifted YORKTOWN and HORNET from the Atlantic to the Pacific. In the first seven months of the war these 5 carriers steamed over 180,000 miles and fought 2 of the war's most important battles - Coral Sea and Midway. The first upset Japanese plans for the seizure of Port Moresby, New Guinea, and the second so reduced enemy naval power that 2 months later United States forces could commence offensive operations on a limited scale at Guadalcanal.

28. By the time of Guadalcanal - August 1942, another fleet carrier, WASP, had arrived in the Pacific, a partial replacement for YORKTOWN and LEXINGTON lost earlier in the year. Japanese resistance to United States operations in the Solomons led to a series of naval engagements during which the HORNET and the newly arrived WASP were lost, bringing the total sinkings of fleet carriers to 4. The Japanese had in the same period lost 6 of their original carrier force of 9. As a result, carrier operations virtually came to a standstill awaiting the completion and commissioning of new ships and the training of new air groups. From October 1942 to August 1943, there was little employment of fleet carriers in the Pacific.

29. During this period, the United States Navy had an opportunity to apply the lessons of the first year of hostilities. Some of these concerned matters of equipment for the ships and training of the crews in damage control to decrease the vulnerability of the carriers to bombs and torpedoes. Others had to do with aircraft complements and emphasized the need for additional fighters both as escort for the attack planes and as a means for

defending the parent vessels. The most important of all dealt with tactics. Before the war the techniques of operating aircraft from carriers and the handling of individual ships had been well mastered. In fleet exercises, however, each carrier had operated independently with its screen. In the first United States carrier action of the war, a raid on the Marshall Islands, 1 February 1942, ENTERPRISE had attacked from the north while YORKTOWN had operated from the south of the islands. The air group of each had concentrated on different objectives. This was common in the first year of the war, and much naval opinion believed that, even when carriers operated in close proximity against the same target, they should separate under attack, each with its own screen.

30. The new carriers with their air groups became available in significant numbers by the summer of 1943. Equipped with F6F fighters, SBD dive bombers, and TBF torpedo planes, they went into action for the first time on 31 August 1943 against Marcus Island, employing 2 fleet and 1 light carrier, all within a single screen. This formation both permitted more effective air defense with fewer fighters per carrier than when the carriers operated independently and provided a greater concentration of antiaircraft fire when under attack.

31. This initial raid was followed by others on various enemy held atolls. At Wake on 5 and 6 October 2 such carrier task groups operated under a single tactical command. On 19 November 1943, 4 carrier task groups went into action against the Gilbert Islands and constituted the first use of the fast carrier task force as it continued through the rest of the war. There remained much to be learned, but the basic organization on which to build had been created. The force made its next appearance at the end of January 1944 when it covered landings

on Kwajalein, Majuro, and Eniwetok Atolls in the Marshalls. This was also the occasion when it first carried the designation of Task Force 58. These actions, indicative as they were of the capabilities of the fast carriers, did not bring the task force close to a large land area defended by numerous enemy aircraft. Raids on Truk, the Palaus, and Marianas, which followed were largely one or two day affairs and did not give a true test of ability to establish air superiority over significant opposition.

32. In April 1944, Task Force 58 moved through Japanese waters as far as New Guinea in order to assist Southwest Pacific forces carrying out landings in the Hollandia area. The failure of the enemy to bring up aerial reinforcements rendered the task fairly easy and delayed a real test of the carrier task force's ability to fulfill its entire responsibility until the campaign to seize Saipan and Guam in the Marianas. This operation, which continued from 11 June through 10 August, was important historically not only because it resulted in the seizure of a base within what the enemy regarded as his inner defense perimeter, but also because it saw the fast carrier task force carry out all its principal missions, employing practically all the techniques which were to characterize its principal missions, employing practically all the techniques which were to characterize its operations through the remainder of the war. Task Force 58 used fighter sweeps, night intruders and hecklers, combat air patrols over the target as well as over the force, and picket destroyers. It established and maintained air superiority, softened up beach defenses and other military installations in advance of landings, sought to isolate the objective area by raids on the Bonins, repulsed efforts of Japanese Fleet to come to the aid of the defenders, attacked shipping in the area, and assisted the escort carriers in furnishing close support to ground troops.

33. The Central Pacific offensive moved from the Marianas to the Western Carolines in September 1944. Beginning at the end of August, the fast carrier task force struck the objective at Palau and also such supporting areas as the Bonins, Okinawa, Formosa, and the Philippines. The enemy weakness discovered in the latter led directly to speeding up the return of Southwest Pacific Forces to the Philippines at Leyte on 20 October. Here, the fast carrier task force again supported amphibious forces in the initial landings and from 24 to 26 October participated in the largest naval engagement in history - the Battle for Leyte Gulf. This series of encounters, which involved not only carriers but also all types of naval vessels from battleships to PT boats, ended the career of the Japanese Navy as an effective fighting force. The dispersed remnants possessed at the most a nuisance value they could not impede significantly the progress of the United States offensive.

34. The Battle for Leyte Gulf also marked a significant turning point in enemy tactics. From November 1943 through October 1944 large scale raids launched against United States fast carrier forces had been uniformly intercepted and the few planes that did slip past fell victims to antiaircraft fire or failed to effect significant damage with their bombs and torpedoes. Beginning during the battle itself the Japanese began launching small-scale raids - frequently only 3 or 4 planes each. A number of these would appear simultaneously on the radar screens with the object of saturating radar defenses and perhaps slipping one or more small groups through to the force itself. At the same time [illegible] and added significantly to the proportion of hits for the number of aircraft attacking and per aircraft lost.

35. The Japanese ability to initiate suicide tactics on a large scale remains incomprehensible to the western mind and the explanation for employing them was not made any clearer by the wartime propaganda of the Japanese government, which sought to propagate the idea that they had a spontaneous origin in the minds of the pilots. The Imperial High Command apparently undertook kamikaze methods when others had failed and the situation required a desperate remedy. Among the reasons advanced were technological superiority of United States aircraft and equipment, the disparity in training between United States naval and Japanese pilots, and the increase in Japanese plane production that made available numbers of aircraft, which, since they would probably be lost in the hands of unskilled aviators, might as well be expended in the manner likely to bring the highest return. The loss by the Japanese Navy of 1,500 trained flying personnel in the Marianas campaign appears to have determined the High Command that the time had come to exploit the kamikaze frame of mind. 4/

4/ USSBS, Japanese Air Power, Washington 1946, discusses the kamikaze offensive.

At least some of the basic factors may be reported statistically as follows:

TABLE I

JAPANESE AIRCRAFT STRENGTH AND PILOT EXPERIENCE 5/

At End Of Month	Strength in No. of A/C Japanese Tactical Air Units	Monthly Production Japanese Tactical Aircraft	Flying Experience of Japanese Pilots In Hours*	
			Navy	Army**
Dec. 1941	2,675	426	700	500
Dec. 1942	3,200	793	625	325
Dec. 1943	4,050	1,622	500	250
Dec. 1944	4,100	1,383	275	125
July 1945	4,600	762	100	100

*Comparable figures on flight experience of U.S. naval aviators are not available. The following figures in average hours of training before deployment are, however, indicative: 1941 - 305; 1943 - 500; 1944 - 525; 1945 - 525.

**The Central Pacific was an area of Japanese naval responsibility. U.S. fast carrier task forces rarely encountered Japanese army air units.

36. The reaction to the change in enemy tactics was to emphasize certain already existing techniques. It was immediately apparent that the best means to cut down on suicide attacks was to prevent the enemy from operating off fields within range. To accomplish this, a large number of fighters first conducted a sweep, followed by the institution of aerial patrols over the fields in question. A 3-strike system by which there was always a patrol over the field and usually one ready to take off while the third was en route in either direction or being rearmed and fueled [illegible] hecklers and intruders watched the fields by night and special dawn-and-dusk patrols covered the critical hours indicated by their name. Around the force itself were picket destroyers each with a

5/ Ibid pp 29,40.

combat air patrol whose function was not only to intercept enemy raids but also to check all returning United States aircraft to make sure that no Japanese planes were sneaking in behind friendly formations.

37. The new tactics were first tried out in supporting the landing of Southwest Pacific Forces at Mindoro in December 1944. Their success on this occasion led to their extension and retention for the remainder of the war. In January 1945, the fast carrier task force entered the South China Sea largely with the objective of destroying enemy shipping. It also attacked Hongkong, Formosa, and Okinawa.

38. On 16-17 February, the fast carrier task force raided the home islands of the Japanese Empire, striking at Tokyo itself. This was preliminary to the amphibious operations against Iwo Jima scheduled for the nineteenth of the same month. The carriers returned to the coast of Japan on 25 February and again on 18-19 March. The latter raid opened the campaign for the capture of Okinawa, which involved in addition to the fast carrier task force over 1200 vessels in the amphibious forces. The Japanese resisted this landing vigorously not only ashore but also in the air and on the sea. They even went so far as to commit without air cover their remaining super-battleship accompanied by a cruiser and 7 destroyers. Carrier aircraft sank the battleship YAMATO and all the screen except 3 destroyers.

39. More important [illegible] this [illegible] offensive. The enemy went virtually all-out in his effort to break up the invading forces. Three task groups, composing the fast carrier task force, remained at sea in the area 47 days, 62 days, and 77 days, respectively. They were employed in raiding the bases on Kyushu from which the kamikazes came, in protecting the amphibious forces, and in supporting troops ashore. No carriers or support ships

of the fast carrier task force were sunk but 11 fleet and 1 light carrier received some damage. Of these, 5 continued in action and another 4 were only temporarily out of action, able to resume flight operations after only a few hours delay. The fast carriers were withdrawn only after enemy opposition in the air had virtually disappeared and the build-up of land-based air had proceeded to a point where it could take over the responsibility for launching attacks against Japanese installations on Kyushu and Southern Honshu.

40. The final fast carrier actions of the war began 10 July and ended on 15 August with cessation of hostilities. During that period the fast carriers cruised off the coast of Japan seeking to reduce enemy air power and to destroy what naval vessels remained. Carrier aircraft also attacked industrial installations and lines of communication. These operations were preliminary to the invasion of Japan itself scheduled for the autumn of 1945.

IV.

[illegible]. UNITED STATES FORCES EMPLOYED

CARRIERS

41. The United States Navy had in commission at various times during the war 24 fleet (CV) and 9 light (CVL) carriers. Of the CV's, one, the U.S.S. RANGER, was precluded by design limitation from fast carrier task force operations. Three others were commissioned so late in the conflict that, even though two of them had completed shakedown, they did not engage in combat. Twenty fleet and 9 light carriers, therefore, accounted for virtually the entire combat record discussed below.

SUPPORT SHIPS

42. Whenever carriers put to sea, they required a screen, usually composed of battleships, heavy and light cruisers, and destroyers. Table II shows for selected operations the number of each type per carrier, and the percentage of fleet effort involved. The most striking aspect of the table is the relative constancy of the figures for the number of support ships per carrier and in terms of fleet effort involved. This is especially true if light (CL) and heavy cruisers (CA) are considered together, for as the percentage of the latter declined, that of the former increased. If the exceptional conditions of early 1942 may be excluded, on only one occasion did support requirements necessitate the assignment of half the available ships of any type to support the carriers (48.6 per cent of the CL's in the Marianas, June 1944), and on only one other date were as much as 40 per cent used, (BB/CB on March 18, 1945 at Okinawa). In the category of destroyers, [illegible] st important escort type of all, the highest percentage employed in fast carrier task forces was 18.2.

TABLE II

COMBATANT SHIPS IN FAST CARRIER FORCES AND TOTAL ON HAND

TABLE II

COMBATANT SHIPS IN FAST CARRIER FORCES AND TOTAL ON HAND

On First Days of Selected Actions in World War II

Date	Operation	SHIPS IN FAST CARRIER FORCE: No. of Task Groups	Carriers: CV	Carriers: CVL	Total	Support Ships: BB	Support Ships: CA	Support Ships: CL	Support Ships: DD	Support Ships per Carrier: BB	Support Ships per Carrier: CA	Support Ships per Carrier: CL	Support Ships per Carrier: DD	Total Ships in Fleet: CV	Total Ships in Fleet: CVL	Total Ships in Fleet: BB	Total Ships in Fleet: CA	Total Ships in Fleet: CL	Total Ships in Fleet: DD	Percent CV Force Ships to Total of Type: CV	Percent CV Force Ships to Total of Type: CVL	Percent CV Force Ships to Total of Type: BB	Percent CV Force Ships to Total of Type: CA	Percent CV Force Ships to Total of Type: CL	Percent CV Force Ships to Total of Type: DD
1942																									
1 Feb	Marshalls Raid	2	2	0	2	0	5	0	10		2.50		5.0	7	0	15	18	21	179	28.6			27.8		5.6
10 Mar	Lae-Salamaua	1	2	0	2	0	7	0	14		3.50		7.0	7	0	15	17	23	173	28.6			41.2		8.1
4 June	Battle of Midway	2	3	0	3	0	7	1	14		2.34	0.33	4.67	6	0	18	17	23	186	50.0			41.2	4.3	7.5
7 Aug	Guadalcanal Landing	1	3	0	3	1	5	1	15	0.34	1.67	0.33	5.0	5	0	18	17	25	201	60.0		5.6	29.4	4.0	7.5
26 Oct	Battle Santa Cruz	2	2	0	2	1	3	3	14	0.50	1.50	1.50	7.0	3	0	19	14	26	214	66.7		5.3	21.4	11.5	6.5
1943																									
31 Aug	Marcus Island Raid	1	2	1	3	1	0	2	10	0.34		0.67	3.33	8	7	21	14	29	307	25.0	14.3	4.8		6.9	3.3
19 Nov	Gilberts Campaign	4	6	5	11	6	3	3	21	0.55	0.27	0.27	1.91	8	8	21	15	29	330	75.0	62.5	28.6	20.0	10.3	6.4
1944																									
30 Jan	Marshalls Campaign	4	6	6	12	8	3	3	35	0.67	0.25	0.25	2.91	11	9	21	16	33	344	54.5	66.7	38.1	18.8	9.1	10.2
30 Mar	W. Carolines Raid	3	5	6	11	6	3	3	35	0.55	0.27	0.27	3.18	12	9	21	16	33	362	41.7	66.7	28.6	18.8	9.1	9.7
11 June	Marianas Campaign	4	7	8	15	7	4	17	60	0.47	0.27	1.13	4.0	14	9	23	16	35	377	50.0	88.9	30.4	25.0	48.6	15.9
9 Sept	Palau - Morotai	4	8	8	16	6	4	8	60	0.38	0.25	0.50	3.75	15	9	24	16	39	393	53.3	88.9	25.0	25.0	20.5	15.3
10 Oct	Leyte Campaign	4	9	8	17	6	4	10	58	0.35	0.24	0.59	3.41	17	9	25	17	40	393	52.9	88.9	24.0	23.5	25.0	14.8
1945																									
3 Jan	Lingayen Campaign	4	8	5	13	6	3	10	52	0.46	0.23	0.76	4.0	17	8	25	17	43	401	47.1	62.5	24.0	17.6	23.3	12.9
16 Feb	Iwo Jima Campaign	4	11	5	16	9	5	10	74	0.56	0.31	0.63	4.63	18	8	25	18	46	407	61.1	62.5	36.0	27.8	21.7	18.2
18 Mar	Okinawa Campaign	4	10	6	16	10	3	11	64	0.63	0.19	0.69	4.0	18	8	25	19	46	418	55.6	75.0	40.0	15.8	23.9	15.3
10 July	Assault on Japan	3	8	6	14	9	2	14	60	0.64	0.14	1.0	4.29	20	8	25	21	49	435	40.0	75.0	36.0	9.5	28.6	13.8

NOTE: Beginning 9 September 1944 1 CB, and 10 October 1944, 2 CB's are included with BB's.

LOGISTIC SUPPORT SYSTEM

43. Experience had not prepared the United States Navy for the logistic problems of the war in the Pacific. Not since the days of sailing vessels had fleet operations been attempted over such long distances. Although World War I had witnessed a considerable movement of forces across the Atlantic, the Navy had found available the highly developed ports and industrial facilities of France and England. As late as March 1940, the Commander in Chief of the United States Fleet did not consider the basing of the Fleet or even a substantial portion of it at Pearl Harbor "a remote possibility."

44. Prior to World War II the United States Navy was tied to its bases. A major base contained all the facilities and furnished all services necessary for the support, maintenance, and repair of the Fleet and its equipment and for the recreation and rehabilitation of personnel. For ships there were berthing facilities, loading equipment, and dry docks; for equipment there existed a multiplicity of specialized shops to insure upkeep and repair. Supplies from nuts and bolts to the most complex ordnance parts were available, including clothing and provisions of all types. Tank farms had on hand fuels and lubricants for ships and aircraft. An associated air base stood ready to furnish replacement aircraft, spare parts, and other aeronautical equipment and to provide for repair and overhaul of planes. For personnel there were rest areas, recreational opportunities, and, if need be, hospitals. No such base existed west of Pearl Harbor and in fact except for limited facilities in the Philippines, soon to be captured by the enemy, the Navy had no accommodations for its Fleet units in the South and Central Pacific.

45. From this inauspicious beginning the Navy developed its logistical system. The historian of naval logistics points out that the prosecution of the campaigns across the Pacific required two different types of naval forces: naval task forces composed of carriers, battleships, cruisers, and lesser combatant types; and expeditionary forces composed of landing troops, amphibious elements, and supporting units. For the naval task forces the maintenance and support requirements were "fairly stable and could be calculated without reference to particular operations ... The variable factor in fleet maintenance was not so much what the forces would require at a given time as where they would be when supplies or maintenance were necessary." The expeditionary forces, on the other hand, because of the unpredictable exigiencies of a land campaign "constituted the most variable factor in the determination of operational requirements." 6/ The latter required elaborate establishments to store, service, and issue supplies and equipment. Naval task forces needed, however, a logistical system which would provide a flow of a predictable quantity of supplies toward a variable point.

46. One solution to the problem of projecting naval task forces forward and of cutting the tie that bound them to the continental United States or to Pearl Harbor was the construction of advanced bases which would serve as supply and replenishment points and where all except major repairs and maintenance could be effected. The campaign in the South Pacific in 1942 [illegible] Central Pacific "because of the greater distances between objectives and staging areas, the smallness of land areas ..., and the rapidity of forward motion, it was impossible to rely solely

6/ D. S. Ballantine, U.S. Naval Logistics in World War II, Princeton, 1947, p. 173.

upon the development of shore facilities. Rapid prosecution of the Central Pacific campaign and the exploitation of Japanese weaknesses as they developed required some means for furnishing support to task forces more rapidly and more flexibly than was permitted by base development. Mobile base facilities which could serve during the interim for the support of fleet operations and which were not rooted to an area once it became remote from the scene of operations became an important operational requirement." 7/

47. The satisfaction of this requirement was found in the establishment and growth of Service Squadrons 4, 10, and 6. Before hostilities commenced the Navy had solved the problem of refueling at sea and had, in that one respect, increased the mobility of its task forces. This was, however, of limited usefulness so long as the ships must return to a base such as Pearl Harbor for other forms of replenishment. The beginnings of a mobile base coincided with the appearance of the fast carrier task force in the second half of 1943. On 1 November of that year Service Squadron 4 was established to which were assigned 24 vessels ranging from repair ships to 500-ton lighters and which commenced supporting the fleet from Funafuti in the Ellice Islands. It followed the campaign moving to the Gilberts in December shortly after their capture and Kwajalein in the Marshalls in February where it was absorbed by Service Squadron 10. The latter had been commission in mid-January for the purposes which a contemporary memorandum set forth as follows:

> Service Squadron TEN. [illegible] logistic support, including general stores, provisions, fuel, ammunition, maintenance repair, salvage and such other services as necessity may dictate in the support of an advanced major fleet anchorage in the Central Pacific Area. It will furnish similar logistic support to Navy and

7/ Ibid. pp. 175-6.

> Marine shore-based units not otherwise provided for in the area; as well as Army units which may be prescribed from time to time by the Commander in Chief, Pacific Ocean Areas When Service Squadron TEN or units of it are at an advanced base, it will furnish such services and supplies as any of our armed forces thereat may require and the existing circumstances and capabilities permit.8/

48. In February 1944 Service Squadron 10 was established in Majuro Atoll where it continued to service the fast carrier task force until after the opening of the Marianas Campaign in June. To reduce the distance required for ships' travel to obtain supplies, it moved to Eniwetok in June and to Ulithi in October. The final change of base for the headquarters of Service Squadron 10 occurred in May 1945 when it was transferred to the Leyte-Samar Area. As the war progressed, it also established detachments in various other places where its services might be needed by the various forces it was designed to assist. At the end of the conflict in August 1945, besides the headquarters afloat in Leyte Gulf, representatives functioned in Eniwetok, Saipan, Kerama, Retto, and Ulithi.

49. To carry out its mission Service Squadron 10 employed about 40 types of auxiliaries, half of them developed after the war began. These included such diverse types as distilling and barracks ships, floating dry docks, storage barges, specialized repair ships for the many kinds of equipment employed by the fleet, and numerous small craft. At the height of its activity Service Squadron 10 controlled 609 vessels located in 5 anchorages. Because of the general nature of its mission no exact figures are available for the number required to support the fast carrier task force. For the Okinawa Campaign, by which time the mobile base system had reached full development, an estimate has been made on a proportional basis of the share of

8/ History of Commander Service Force, U.S. Pacific Fleet, rest. ms., p. 307.

the Squadron 10 vessels anchored at Ulithi that were needed for support of Task Force 58, as follows:

Merchant Tankers	12
Gasoline Tankers	6
Ammunition Ships	8
Fleet Tugs	7
Hospital Ship	1
Store Ships	6
Destroyer Tenders	3
Barrack Ships	3
Total	46

50. In addition to mobile bases established at anchorages to which carrier forces returned for supply and repair, methods for replenishment while underway at sea were expanded. Prior to the attack on Pearl Harbor the Navy had developed the techniques of refueling at sea and fast oilers had commenced joining the fleet. From time to time oilers carried small quantities of supplies which they also passed at sea. In February 1944, during the first carrier raids against Truk and the Marianas, escort carriers accompanied the oiler group to furnish replacement aircraft. With the approach to the land masses of the Western Pacific, it became desirable to keep the carriers in action over longer periods, and in December 1944, Service Squadron 6 was commissioned to exploit the full possibilities of replenishment at sea with the following mission:

> To furnish direct logistic support to the Fleet in and near the combat zone, in order to maintain the mobility and striking power of the Fleet.9/

51. From its participation on a trial basis in the Iwo Jima Campaign came the techniques which allowed one fast carrier task group to remain 77 days at sea off Okinawa and two others to participate for 62 and 47 days, respectively. Because Service Squadron 6 followed close behind the Fleet and frequently entered

9/ Ibid. p. 270

areas where it might encounter enemy air or submarine attack, it had a number of CVE's and surface escorts attached. It also serviced the combat support and other vessels of the amphibious forces, and it is, therefore, difficult to determine just what share of its ships was required by fast carrier forces alone. In the Okinawa Campaign it employed the following to replenish the task force, but as the same vessels visited amphibious forces while making their rounds the figures are approximate rather than actual.

CL	1
CVE.	7
DD-DE	28
Cargo	2
Oilers	24
Ammunmtion Ships	5
Fleet Tugs	4
Distilling Ships	2
Total	73

52. Important as were the mobile bases and the replenishment forces, carrier forces continued to employ shore installations to some extent. Instances such as Kossol Roads, where there were no facilities whatever on the beach, occurred rarely. Even fleet anchorages in coral atolls had some facilities ashore. A landing strip for the local defense and patrol aircraft needed to protect the fleet and service ships was customary as were a communication center, hospital, fleet post office, and other miscellaneous acitivities. Where spaced afforded, the Service Force attempted to establish recreational facilities for officers and men of Fleet units. At all four of the anchorages principally employed by the fast carrier task force hardstands and taxi-

[illegible] to accommodate a carrier aircraft pool of from 150 to 300 airplanes.10/

10/ Details on facilities at advanced bases may be found in Directory of U.S. Naval Advanced Bases, Conf., a report published monthly during the war. Also Navy Dept., Bureau of Yards & Docks, Building the Navy's Bases in World War II, 2 vols., Washington, 1947. Vol. II deals with the construction of advanced bases. Such a carrier aircraft pool also served Marine Garrison air units and escort carriers supporting amphibious operations.

53. The use of advanced bases by carrier forces during the campaign across the Pacific is summarized in Table III. It will be noted that the location of the headquarters of Service Squadron 10 corresponded with the anchorage principally used by the fast carriers during various periods, and that the months of greatest employment by such forces occurred when the shore facilities were under construction and before formal commissioning and establishment as a base. Visits to other localities were dictated by convenience or special needs. On one occasion in July 1944 several carriers stopped at Saipan to obtain ammunition for operations against Guam. All but three days at the latter place are accounted for by a single carrier which put into that island for temporary repairs. From Table III, it appears that carrier task forces tended to avoid the bases devoted primarily to the support and staging of expeditionary forces, and the bases used by them were among the less costly.

54. The Advanced Base Section of the Service Force summed up the experience of World War II in the following words:

> Among many lessons learned from actual experience in the Pacific war was the desirability of keeping as many activities afloat as possible. Several large Naval Bases were constructed, only to be completed after the trend of the war had moved many miles beyond. They made good rear supply bases and would have proved of great benefit had the course of the war been reversed for a time, but with steady progress into the enemy's defenses, a number of facilities were not used to their maximum when completed. The ideal situation would be to maintain practically all activities afloat in self-propelled vessels, or, lacking that, a mixture of large barges and self-propelled vessels seems the best solution.11/

11/ History of Commander Service Force Pacific Fleet, rest. ms., pp. 60-61.

TABLE III

ADVANCED BASES AND FLEET ANCHORAGES, PACIFIC OCEAN AND SOUTHWEST PACIFIC AREAS
1 NOVEMBER 1943 - 15 AUGUST 1945

BASE	COST*	CONSTRUCTION BEGUN	ESTABLISHED	USE BY FAST CARRIERS PERIOD	CARRIER DAYS	USE BY SERVICE SQUADRON 10** HEADQUARTERS	DETACHMTS OR DIVS.
GUAM	$ 280,7 5,700	26 July 1944	20 Oct 1944	10 Nov 44—1 June 45	17		Sept 44—Feb 45
LEYTE-SAMAR	215,6 3,201	24 Oct 1944	25 Dec 1944	1—30 June 1945	201	May-Aug 1945	March 1945
MANUS	131,7 7,843	3 Mar 1944	18 May 1944	27 Apr-30 Oct 44	31		Aug-Dec 44
OKINAWA	113,7 5,453	1 Apr 1945	1 Apr 1945	None	0		May & July 45
SAIPAN	63,4 2,622	20 June 1944	1 Sept 1944	22 July-4 Nov 44	20		Aug 44-Feb 45 & July 45
ESPIRITU SANTO	36,3 9,925	8 July 1942	1 July 1943	5 Nov 43-22 Mar 44***	87		
TINIAN	35,1 3,275	27 July 1944	5 Dec 1944	None	0		
SUBIC BAY	34,9 6,587	8 Feb 1945	24 Mar 1945	None	0		
NOUMEA	24,2 7,449	26 June 1942	1942	2 June 44***	1		
ENIWETOK	23,0 5,079	21 Feb 1944	10 May 1944	22 June 44-15 Aug 45	342	June-Sept 44	July 45
ULITHI	18,5 0,273	8 Oct 1944	Dec 1944	1 Oct 44-3 June 45	857	Oct 44-Apr 45	July 45
PELELIU	18,6 9,159	20 Sept 1944	6 Jan 1945	None	0		
IWO JIMA	15,1 2,733	21 Feb 1945	5 Apr 1945	None	0		
MANILA	13,3 9,589	Mar 1945	23 Mar 1945	None	0		
MILNE BAY	11,1 1,000	23 May 1943	1 Mar 1944	None	0		
MAJURO	Less than 10 mill.	1 Feb 1944	4 May 1944	4 Feb-5 June 44	504	Feb-May 44	
KOSSOL PASSAGE	" " " "	(None)	(Not establ)	27 Sept-30 Oct 44	16		Dec 44-Feb 45
FUNAFUTI	" " " "	2 Oct 1942	15 Nov 1943	23 Nov 43-25 Jan 44	23		
KWAJALEIN	" " " "	5 Feb 1944	1 Dec 1944	6 Feb 44-12 May 44	49		Mar 44

*Cost includes construction and equipment and represents Navy expenditure at these locations both for its own use and on facilities shared with or occupied by other services.

**Commissioned at Pearl Harbor 15 January 1944.

***Also used by fast carriers during the South Pacific Campaign, August 1942-October 1943.

55. The concept of mobile support and replenishment tended to free carrier forces from dependence on major fixed bases. Naval task forces increasingly drew whatever they required and received all but major repairs from facilities afloat. Some indication of the magnitude of activities at flowing bases may be found in the over-all figures of the most important items issued by Service Squadrons 6 and 10 to all combatant forces during the Okinawa Campaign (22 March-22 May 1945).[12/]

	Service Squadron 10	Service Squadron 6
Fuel Oil	12,624,000	10,133,000 barrels
Diesel Oil	1,240,000	323,000 barrels
Aviation Gasoline	39,002,000	25,573,000 gallons
Bombs and ammunition	30,000	16,000 tons
Replacement aircraft		998 units
Replacement aircrews		220 men
Refrigerated provisions	20,000	2,219 tons
Dry provisions	26,000	4,000 tons

56. The evolution of techniques for mobile support and replenishment continued until the conclusion of hostilities. The invasion of Japan would have witnessed further innovations. Service Squadron 6 planned a separate task unit for continuous operation with the fast carrier groups forward of other combatant forces. These plans are available and with the experience of World War II form the basis for future adaptation of the supply methods developed in the Pacific.

12/ Ibid. pp. 274, 326. In most cases Service Squadron 6 reissued to ships at sea material which it had received from Service Squadron 10 so that the figures are not complementary.

SHORE-BASED SUPPORT OF CARRIER AIRCRAFT

57. Prior to World War II naval aviation employed a relatively simple system for the maintenance and support of carrier aircraft. Minor repairs and upkeep were accomplished by the squadrons themselves using tools and facilities furnished by the carrier when at sea or by the air station when ashore. More extensive repair and overhaul were carried out at a few large air bases with repair and overhaul facilities. Beyond the continental limits, the only bases of such a nature were Pearl Harbor and Coco Solo.

58. Involvement in combat and growing complexity of airframes, engines, and accessories combined to produce changes in the system. To achieve greater mobility and flexibility in the deployment of aircraft, maintenance personnel were detached from the squadrons and organized into separate units, known aboard ships as CASDIV (Carrier Aircraft Service Division) and on the beach as a CASU (Carrier Aircraft Service Unit). In both cases, the units depended for equipment on the carrier or air station to which they were attached. This served to retain the mobility of both air and service units and to make it possible for them to shift bases with a minimum of difficulty.

59. The CASU was by origin a substitute for squadron and air group maintenance and not intended to carry on major maintenance, repair, and overhaul. It was the service unit of a shore-based carrier air group and its functions were set forth in 1943 as follows:

> ... to support a shore based Carrier Air Group including the servicing, rearming, and minor repairs to aircraft, the upkeep of all facilities, and all necessary administrative duties.[13]

13/ ComAirPac, The Advanced Air Base Assembly, RESTRICTED, September 1943.

60. In the continental United States and in the Hawaiian Area the CASU continued to operate as contemplated. In the forward ares, however, the CASU found itself part of an advanced base system and underwent changes in function which were eventually reflected in a change of title and of mission. Under combat conditions CASU's found it necessary to service other than carrier air groups temporarily ashore and frequently became involved in assisting not only replacement air groups and other naval and Marine Corps air units employing carrier type aircraft, but also patrol plane squadrons, utility units, seaplanes, and aircraft of the United States Army Air Forces and Allied air services. In October 1944, the designation of CASU's, except those in the continental United States and the Hawaiian Area, was changed as follows to recognize this situation:

> CASU's (F) - Combat Aircraft Service Units (Forward). These units will service both carrier and VPB /Patrol/ type aircraft, will have an advance base status, and in most cases, will be attached to ACORNS.[14]

61. The CASU, because it had no equipment of its own, depended upon other units. In forward areas this was an ACORN. The ACORN might itself be attached to a larger unit known either as a LION or a CUB. The definitions of these units were as follows:[15]

> LION - A large Advanced Base Unit consisting of all the personnel and material necessary for the establishment of a major all purpose naval base ... to perform voyage repairs and repair minor battle damage to a major portion of a fleet, provide logistic support for operating forces in the area, and operate a large and active port.
>
> CUB - An Advanced Base Unit consisting of all the personnel and material necessary for the establishment of a medium sized advanced fuel and supply base. It does not contain ship repair facilities /but does/ provide logistic support for a small task group of light forces and to operate an active port.

14/ CNO, Aviation Planning Directive, 99-A-44, CONFIDENTIAL Serial 0241431 of 2 November 1944.
15/ CNO, Catalogue of Advanced Base Functional Components, 3rd edition, 1 November 1944, CONFIDENTIAL.

ACORN - An Advanced Base Unit consisting of all the personnel necessary for the establishment of an advanced air base ... which, when augmented by a CASU or PatSU /Patrol Aircraft Service Unit/, enable it to service, rearm, and perform minor repairs and routine upkeep for the planes of one carrier group, its equivalent, or one patrol plane squadron.

62. The growth of a system of mobile support built around Service Squadrons decreased the need for large advanced base assemblies such as the LION and only three were ever deployed; to Espiritu Santo in the New Hebrides (1943), Marcus in the Admiralties (1944), and Guam in the Marianas (1944). CUB's were more used in the early than in the latter part of the war and in the South and Southwest Pacific than in the Central Pacific. Of the 9 actually deployed, 7 went either to the South or Southwest Pacific areas and 6 of these arrived either in 1942 or 1943. The seventh was at Hollandia, New Guinea, a base not used by carrier forces. Only two CUB's were deployed to bases where they may have contributed to the support of fast carrier task forces--Samar and Okinawa.[16/] Both LION's and CUB's were advanced base units which it was expected would accomplish their task and then be dissolved and absorbed into the base. On the same date such units as Construction Battalions and others required in the early phase would be detached and moved on. The last deployed LION was dissolved in October 1944 and the last CUB in July 1945.

63. The ACORN was a more common unit than either the CUB or LION. From 1942 through the end of the war 42 ACORNS were deployed in all Pacific theaters. The ACORN with its attached Construction Battalion was a generic unit which might be called upon to build an air base for large land patrol planes or carrier type aircraft or both, restore a captured airfield to operation,

16/ CNO, Major Repair and Overhaul Facilities at Advanced Bases and in Assembly Status, (Report OpNav 30-11-A11), of 19 September 1945.

or set up a seaplane base with seadrome, ramps, and other facilities. Because of the different duties it might be called upon to perform, the ACORN was of variable size made up of functional components. Each component consisted of a number of officers and men trained to a particular task and each had its allowance of special equipment. For planning purposes a standard land plane ACORN of 1945 had 42 officers and 775 men. The Construction Battalion, attached during the early phase, to build an air station or restore a captured field, had 33 officers and 1,082 men. The seaplane ACORN was slightly smaller, 38 officers and 770 men.[17/]

64. The number of ACORN's which contributed to the support of fast carrier forces by the construction and operation of fields can only be estimated. In some instances fields originally constructed for local defense and patrol plane operations were later used for staging aircraft and for pools when the combat area moved on. Many fields supported multi-purpose operations involving Navy, Marine, and Army Air Forces. A geographic division of deployment may, however, give some rough approximations of use:

DEPLOYMENT OF ACORNS BY AREA[18/]

1942 - 1945

South Pacific	12
Southwest Pacific (except Manus)	1
Manus Area	3
Central Pacific (including Okinawa)	17
Philippine Islands	9
TOTAL	42

17/ CNO, Catalogue of Advanced Base Functional Components, 3rd edition, 1 November 1944, CONFIDENTIAL.

18/ CNO, Major Repair and Overhaul Facilities at Advanced Bases, (Report OpNav 30-11-A11), of 19 September 1945.

65. In 1942 and early 1943, carrier operations were on a small scale and the fast carrier task group and task force as later constituted were unknown. Carriers did support the Guadalcanal Campaign and used Espiritu Santo in the New Hebrides as a base and the ACORN in that area did constribute support to carrier squadrons during periods when they flew ashore. Otherwise South Pacific bases contributed little. In the Southwest Pacific, Manus was established as a major fleet base. Fast carrier task forces, however, used it only for a total of 31 carrier days. Amphibious forces with their escort carriers employed Manus somewhat more frequently. In the Philippines, only Leyte Gulf was visited by fast carrier task forces which drew support from the naval air station and associated activities on Samar. The bulk of fast carrier activity occurred in the Central Pacific. Most of the 17 ACORN's deployed in that area, with the exception of those at purely seaplane bases such as Parry Island in the Marshalls and Tanapag in the Marianas and some purely patrol plane bases such as Iwo Jima, contributed in some degree to the support of fast carrier forces. It is impossible to determine the proportion in which each so contributed except to assume that those bases which the fast carriers most frequently visited were those which most contributed to their logistic support. At the following Central Pacific bases fast carriers passed more than 100 carrier days: Ulithi, 857; Majuro, 504; and Eniwetok, 342. It may safely be estimated that of the 42 ACORN's deployed in all Pacific theaters between 15 and 20 of them established fields which contributed at one [illegible] and that the burden of this support was carried by approximately half a dozen among them.

66. The CASU like the ACORN varied considerably in size according to the mission assigned. For planning purposes

ComAirPac in 1943 fixed the complement at 17 officers and 516 men for a CASU to support a 96-plane carrier air group. With the development of aircraft pools and the need for servicing other types of aircraft, larger CASU's became common, running up to those with personnel to support 300 aircraft.

67. Much the same sort of deployment occurred in regard to CASU's as to ACORN's. In all, 70 were commissioned, of which 34 carried the designation CASU (F), i.e., Combat Aircraft Service Unit (Forward). Between October 1944 and the end of the war, 31 CASU's (F) were actually deployed in the forward areas, as follows:

DEPLOYMENT OF CASU'S (F) BY AREA, 1944-1945[19]

South Pacific	2
Southwest Pacific (except Manus)	0
Manus	1
Central Pacific	19
Philippines	9
TOTAL	31

68. Unlike the ACORN, the CASU (F) did not lose its identity upon completion of its mission but remained mobile. Several CASU's (F) listed above as in the Philippine area had moved up from the South Pacific in late 1944 and early 1945. The number of these units supporting fast carrier task forces cannot be accurately determined. Except for the two at Samar, other CASU's (F) in the Philippines existed almost solely for patrol plane operations. Manus, as indicated above, certainly [illegible] of supporting major fleet activity but was not much used by fast carriers. The principal area of carrier task force operations, the Central Pacific, significantly had the largest numbers of CASU's (F) - 19. Again the percentage of effort used

19. Ibid. The absence of CASU's (F) in the Southwest Pacific Area is explained by the fact that carriers and carrier aircraft did not operate in the area, and maintenance units for patrol aircraft retained the older title of PatSU, which disappeared with the reorganization of October 1944

in support of fast carrier task forces cannot be determined. Certain CASU's (F) may be excluded because of location at seaplane or land-based patrol plane bases not used by carriers. Again it may be said that of the 31 CASU's (F) between 15 and 20 played some role in assisting the fast carrier task forces. The burden probably fell on those located near anchorages to which the carriers returned for replenishment and on those operating aircraft pools.

69. Early in the war, the Navy contemplated setting up units to engage in repair and overhaul activities beyond the ability of CASU's and PatSU's. Such units were tried during the South Pacific Campaign in 1942 and 1943 but did not prove markedly successful. In the Spring of 1944, a board headed by Rear Admiral A. W. Radford developed the Integrated Aeronautic Maintenance, Material and Supply Program for logistic support of naval air forces. This plan called for supplying combat units with new production aircraft only, a minimum of repair and maintenance activity in forward areas, and the return of repairable aircraft to continental shops for overhaul and reissue to non-combatant activities. Based on a flow principle, the Integrated Aeronautic Program tended to reduce the need for repair and overhaul activities west of Hawaii. During 1945, there were three AROU's (Aviation Repair and Overhaul Units) deployed at three of the most important bases for the support of expeditionary and amphibious forces--Guam, Manus, and Leyte-Samar. AROU's repaired and overhauled both airframes and engines; the Aviation Repair Unit (ARU) handled airframes only. There were [illegible] Cebu in the Philippines.

70. One feature of the Integrated Aeronautic Program was the existence of pools of aircraft to receive and regulate the flow. In July 1945, when inventories were full and the

Integrated Aeronautic Program in full swing, the following numbers of carrier type aircraft were in pools:

CARRIER TYPE AIRCRAFT IN POOLS IN PACIFIC OCEAN AREAS[20/]
3 July 1945

	Ready for Issue	Awaiting or under Repair	Awaiting Return to U.S.	Awaiting Classification	Total
Marshall Islands					
Ebeye	--	--	--	--	--
Eniwetok	11	1	--	--	12
Roi	92	1	--	1	94
Caroline Islands					
Ulithi	--	--	--	4	4
Marianas Islands					
Guam	513	210	81	95	899
Saipan	--	--	--	--	--
Okinawa	2	9	40	3	54
Manus	10	6	15	3	34
Philippine Islands					
Samar	255	13	21	153	442
Jinamoc	--	--	3	3	6
TOTALS	833	240	160	262	1,545

71. In addition to carrier type aircraft in pools, CASU's (F) had some 348 in custody on this same date. Of this total, 294 were distributed among three CASU's (F) on Saipan. The indication in the above table that there were no carrier type aircraft in the pool at Saipan appears to have been a book-keeping distinction. Elsewhere, giving custody of pool aircraft to CASU's (F) does not appear to have been customary. Ebeye and Jinamoc were primarily seaplane bases and would not be expected to have carrier aircraft available. Otherwise the table shows how the war had progressed. Majuro which had once possessed a pool ceased to figure at all. Ulithi, until May 1945, a principal anchorage of the fast carrier task forces, had only four aircraft left. Samar in the Philippines had been the anchorage to which

20/ ComAirPac, Weekly Aircraft Availability Report, 3 July 1945.

the fast carriers had returned between the Okinawa Campaign and the final operations off Japan. Guam was according to its mission "To be developed, as a Fleet base, as an advance air base for operation of aircraft, as a rehabilitation and staging area for ground forces, for reception and staging of casualties, and as a supply base for supporting future operations." It was from Guam that major support had been given to the expeditionary forces in Okinawa, and in July 1945 it was being prepared for the amphibious assault upon Japan. The 899 carrier type aircraft in its pool were then to replenish the fast carrier task forces and also the escort carriers employed in amphibious operations, the Marine Corps squadrons on Okinawa and in the Carolines, and the Navy's inshore patrol squadrons. The same was true of other pools. No information is available to show what percentages of aircraft were furnished each of the four kinds of unit employing carrier type aircraft. It may be assumed that the pool at Samar contributed more to fast carriers and that at Guam more to amphibious forces, but this is not very definite, because a carrier does not have to anchor at or even to approach the pool within less than 100 miles to receive replacement aircraft. They might be flown aboard whenever the carrier was within range.

72. During World War II the Navy's support system did not differentiate between fast carrier task forces and other types of forces. This integration was particularly evident in the use of land-based facilities. Aircraft service units did not distinguish between planes from carriers and those employed by Navy and Marine Corps from land-bases for a variety of purposes not germane to this study. Pools existed to support all Naval and Marine users of aircraft. Table IV endeavors to show in condensed form the Naval advanced base situation as it applied to support of fast carrier task forces in July and August 1945, when aircraft inventories were full, the floating mobile support

system represented by Service Squadrons 6 and 10 in full development, and ground, sea and air forces assembling for the planned assault on Japan. It cannot be said that in any instance were the facilities in Table IV used exclusively for support of fast carrier task forces. It cannot be determined what percentage of effort at each base was devoted to the support of any particular type of force.

73. In summary, late in the war when carrier operating and supporting techniques reached their full development, land pools in forward areas contained about 1,500 carrier type aircraft, principally at Guam and Leyte Gulf; while another 300 such aircraft were in the custody of service units, the majority at Saipan. These facilities existed not only for the servicing and replenishment of the 1,000 to 1,200 aircraft in fast carrier task forces, but also of carrier type aircraft in other forces, such as the escort carriers supporting amphibious forces, Marine Corps units, and Navy inshore patrol squadrons. Just what share of the effort involved went into support for the fast carrier task forces cannot be determined.

TABLE IV

AVIATION FACILITIES AT U.S. NAVAL ADVANCED BASES
EMPLOYED FOR THE SUPPORT OF FAST CARRIER TASK FORCES[2]/
(July-August 1945)

TABLE IV

AVIATION FACILITIES AT U.S. NAVAL ADVANCED BASES EMPLOYED FOR THE SUPPORT OF FAST CARRIER TASK FORCES[21]

(July-August 1945)

BASE	MISSION	DESIGNATION OF CASU (F) (WITH NO. OF CARRIER TYPE A/C IN CUSTODY)	NO. OF CARRIER TYPE A/C IN POOL	OTHER REPAIR UNITS	OTHER AVIATION ACTIVITIES
Marshall Is					
Eniwetok Atoll	Support 1 VP(HL), 1/2 VF(N) 1 NATS unit; staging all types including AAF, VRL	35 (None)	12	None	Parry Island Seaplane Base
Kwajalein Atoll[a]					
Ebeye	Headquarters. Com. MarGils Area Facilities reduced to emergency staging for seaplanes	18 (None)	—	None	None
Roi-Namur	1 replacement CAG 4 VMF, 1 VMF(N) 1 VP (ML), 1 VS	20 (None)	94	None	Aviation Supply Depot
Majuro Atoll[b]	2 VMB, 1/2 VS, staging 1 AAF Fighter Group; Advanced Fleet Anchorage without shore based facilities	30 (None)	—	None	None
Marianas Is					
Guam	Fleet Base, advanced air base for operations, rehabilitation and staging area for ground troops, supply base for supporting future operations				
Airbases					
Agana		43 (42)	899	AROU-4	Aviation Supply Depot
Orote		12 (None)	—	ARU	

Guam	Fleet Base, advanced air base for operations, rehabilitation and staging area for ground troops, supply base for supporting future operations				
Airbases					
Agana		43 (42)	899	AROU-4	Aviation Supply Depot
Orote		12 (None)	—	ARU	
Saipan[c]	Develop as an advanced air base to support AAF, VLR Operations, Harbor facilities, casualty reception and staging center. Support local naval activities.		—	ARU	Aviation Supply Annex Tanapag Seaplane Base
Airbases					
Kobler		15 (134)			
Manpi Pt.		47 (98)			
Kagman		14 (62)			
Tinian	Develop as an advanced air base to support AAF, VLR operations, Harbor facilities, naval base to support local naval activities	44 (10)	No pool[d]	None	None
Caroline Is					
Ulithi Atoll[e]	Fleet anchorage with air base to support 1/2 VF(N), 1 VS, 1 VJ, and staging for transport aircraft, Facilities limited to those necessary for support of garrison and a minimum of shore installation for fleet support	51 (None)	4	None	Marine Air Base
Palau Is	Advanced air base for 1/2 VF(N), 1 VF, 1 VS or VP(ML), 1 VP(HL), staging aircraft to SoWesPac area	52 (1)	No pool	None	Marine Air Base
Okinawa[f]	Establish bases from which to attack main islands of Japan and their sea approaches etc.	3 (None)	54	None	ACORN-29 ACORN-44 Aviation Supply Depot
		11 (1)			
Philippine Is[g]					
Leyte Gulf	Provide a major naval and air base for advanced operations capable of service, supply and repair to forces afloat, air forces, and other allied units.	32 (None)	442[h]	AROU-2	Aviation Supply Depot ACORN-13 First Marine Air Wing Jinamoc Is. Seaplane Base
Samar		49 (None)			

	Japan and their sea approaches etc.	11 (1)			Aviation Supply Depot
Philippine Is(g)					
Leyte Gulf	Provide a major naval and air base for advanced operations capable of service, supply and repair to forces afloat, air forces, and other allied units.	32 (None)	442(h)	AROU-2	Aviation Supply Depot ACORN-13 First Marine Air Wing Jinamoc Is. Seaplane Base
Samar		49 (None)			
Admiralty Is					
(Manus)	Provide a major naval and air base for advanced operations capable of service, supply, and repair to forces afloat, air forces, and other allied units.		34	AROU-1	Lombrun Point Seaplane Base Aviation Supply Annex Aviation Reequipment and staging Depot ACORN-24
Airbases					
Mokerang					
Momote					
CV Field No. 1		13 (None)			
CV Field No. 2		13.1 (None)		PATSU, 1-13	

NOTES: (a) Base at Kwajalein Island used by transient aircraft of all services. No CASU(F) or other Navy service unit.
(b) ComAirPac, Weekly Aircraft Availability Report, no longer listed this pool in July 1945.
(c) Tanapag was a seaplane base. For a discussion of aircraft pool on Saipan, see above.
(d) Naval Advanced Base Directory, August 1945, lists a pool on Tinian. ComAirPac does not. Aircraft Availability reports do not indicate a pool.
(e) Ulithi when used by fast carrier task forces had an active aircraft replacement pool.
(f) Okinawa was still in build-up stage in August 1945.
(g) Other than Leyte-Samar Area, air installations in Philippines were used by land-based patrol aircraft of Fleet Air Wings 10, 17, and by Marine Aircraft attached to U.S. SIXTH Army.
(h) 6 carrier type A/C are listed in the pool at the seaplane base at Jinamoc Is.

21/ Sources: CNO, Directory of U.S. Naval Advanced Bases, (Op-30-11 Report No. A-7, August 1945).
CNO, Major Repair and Overhaul Facilities at Advanced Bases, (Report OpNav 30-11-All of 19 September 1945).
ComAirPac, Weekly Aircraft Availability Report, 3 July 1945.

V.

UTILIZATION OF FORCES

CARRIERS

79. Carriers followed the life-cycle of naval vessels through commissioning shakedown, operation, repair and over-haul, and back to post-overhaul shakedown and trials. As a basis for a study of utilization, the life-cycle was divided into the following categories:

CTF or Assault - period when a ship was assigned to a task force and ready and available for action.

Antisubmarine Warfare - period of assignment to antisubmarine operations as a primary mission.

Transport - period actually employed in the transport of men, equipment, and material.

Pilot Training - a period of assignment to training air groups not attached to the ship; does not include exercising own air group, etc.

Repair and Overhaul - period of time from date of detachment from a combat force or area until departure from shipyard to rejoin the Fleet.

Shakedown and Training - period following commissioning and occasionally after a major overhaul during which crew, vessel, and air group are prepared for active duty.

Unassigned - period for which employment is not clearly indicated in the available records.

75. Enclosure C reproduces a statistical analysis of carrier utilization made by the Aviation History and Research Section of the Office of the Deputy Chief of Naval Operations (Air). Substantiation of the statements which follow may be found by referring to that appendix.

76. Except for the first year of the war, before CVE's were available, the Navy reserved its CV's and CVL's for combat [illegible] categories of fast carrier employment were shakedown and repair and overhaul, both of which were necessary to efficient use of the carriers. Even with the dispersion of effort during the first year of the conflict and the shakedown time of those vessels which never saw operations, CV's and CVL's spent 64 per cent of

their commissioned time assigned to a task force and available for operations, 44 per cent at sea on operational mission, and 10 per cent actually engaging the enemy.

77. During the war there occurred intervals when carriers, although available, were not used, because of insufficient numbers for offensive operations, or reservation for support of imminent amphibious campaigns. An indication of fuller capabilities may be gained from the utilization of CV's during the period January through June 1945. The half-year chosen includes the support of landings at Lingayen Gulf, raids in the South China Sea, and the campaigns against Iwo Jima and Okinawa. Of the 1,947 carrier days available 1,443 or 75 per cent were passed at sea, and the enemy was engaged on 518 or 27 per cent. A further measure was developed by determining similar percentages for 2 months of sustained activity, July 1944 and April 1945, with the following results:

	July 1944	April 1945*
Assigned carrier days passed at sea	75%	92%
Assigned carrier days engaging enemy	41%	55%

CARRIER AIRCRAFT

78. The number of carrier type aircraft on hand increased throughout the war period. Beginning 1 January 1942, when the Navy had 537 fighter and 776 attack aircraft (the latter divided between dive-bombers and torpedo planes), the number doubled by the first of the following year, and in 1943 it more than tripled until on 1 January 1944, there were 6,384 fighter and 6,624 attack planes on hand. With the attainment of full production in early 1944, the rate of increase decreased. The number of fighters did not quite double in 1944, while the attack planes on hand increased by about 50 per cent. In the 8 months of war in 1945, inventories increased about 24 per cent for fighters and 7 per cent for attack planes, leaving the Navy at the end of the war with 14,524 carrier-type fighters and 9,952 dive bombers and torpedo planes.

* Month of greatest activity in World War II

79. Because the reporting system changed several times during the conflict, exactly comparable figures for different categories are hard to derive. The problem is further complicated because the Navy assigned a portion of its carrier type aircraft to the Marine Corps and to such naval shore-based activities as inshore patrol squadrons. Tables prepared by the Aviation History and Research Section of DCNO (Air), however, seek to give uniform information throughout the war period, and since they agree with other evidence showing general trends, are regarded as sufficiently correct to be used as the basis for measures of utilization. 22/

80. The first year of the war saw rather wide fluctuation in percentages because with a limited inventory, a small change was immediately reflected throughout the organization. Even so, by the end of 1942, the commitment of between 12 and 18 per cent of the aircraft on hand to carrier squadrons, based ashore, principally in training or awaiting assignment, had become fixed. In 1942 during the Guadalcanal campaign, after the Navy had lost 4 carriers, a few carrier squadrons supported the Marines from shore bases. This practice was discontinued in 1943 as new carriers became available. The percentage involved in logistic support tended to vary monthly with the intensity of operations. Representative figures obtained by taking percentages for the first day of each quarter throughout the war indicate an average of approximately 35 per cent of the aircraft on hand were in repair and overhaul pools, pipelines, and other logistic support activities. Toward the end of the conflict in the spring and summer of 1945, the percentage rose to over 40 per cent for both fighter and attack types, the results of growing inventories and lengthening supply lines.

22/ These figures are contained in Enclosure D.

81. The Navy had aboard operational carriers from 30 per cent (April 1942) to 10 per cent (July 1945) of its available carrier type fighters. Between 1 October 1943 and 1 August 1945, the period of major carrier campaigns, the percentage varied from 12.4 (January 1945) to 10 (July 1945) or about 11 per cent for any given time. Although from existing records it is not feasible to separate CVE's from fast carrier forces, the figures may be analyzed to show the number of planes devoted to fast carrier and amphibious assault operations as differentiated from antisubmarine warfare, shakedown, and miscellaneous activities, principally pilot training. The assignment of fighters to CTF and assault varied from 23 per cent in April 1942 to 6.5 per cent in July 1944. For the October 1943 to August 1945 period, this percentage varied from 10.4 to 6.5 with a tendency to rise through the latter half of 1944 and 1945 as the carrier complements were changed to increase the number of fighters both absolutely and relative to other types. For the 7½ months of hostilities in 1945 the figure was slightly under 9 per cent.

82. For dive bombers and torpedo planes, which are considered together, the Navy had aboard operational carriers a maximum of 41 per cent of those on hand (January 1942) and a minimum of 6.3 per cent (July 1945). Those for carriers engaged in task force and amphibious operations are even more revealing for they differed by a much smaller degree, 7.8 per cent in October 1944 to 5.5 per cent in July 1945 with the figure for the latter year never going above 5.8 per cent.

83. In its total-on-hand figures for carrier type aircraft, the Navy carried those assigned to Marine Corps land-based squadrons and in its commitments for training and logistic purposes reserved aircraft for the support of this force. Trial samples

indicate that, if the figures were adjusted to remove the commitments to the Marine Corps, the percentages for utilization aboard operational carriers and in CTF and assault would be raised between 2 and 3 per cent.

84. To illustrate how the Navy employed carrier aircraft in the closing months of the war, a typical distribution of 1,000 fighters and 1,000 dive bomber and torpedo planes is shown in the following table:

TABLE V

TYPICAL DISTRIBUTION OF CARRIER AIRCRAFT, 1944-1945

	VF	VB/VT
On board carriers assigned to CTF and assault	89	55
On board ASW Carriers	10	10
On board carriers in shakedown	7	7
On board carriers otherwise assigned	4	4
Total on board operational carriers	110	76
Carrier Squadrons based ashore	181	155
Marine Corps land-based air	102	65
Training Commands	105	159
Other naval shore based activities	92	75
Logistic support	410	470
TOTAL	1000	1000

85. In general, these figures represent a period when inventories were full and the Navy was assembling aircraft for assaults on Japan. The greater utilization of fighter planes represents an evolution which had gone on throughout the war. Standard complements for CV's on the dates of selected operations were as follows:

Operation	Date	VF	VB	VT	Total
Marshall Islands	1 Feb. 1942	18	36	18	72
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Leyte Gulf	20 Oct. 1944	55	24	18	97
Okinawa	1 Apr. 1945	73	15	15	103

86. The rapid increase in fighter complements which began in the second half of 1944 resulted from two factors: (1) increased use of fighter-bombers and (2) the introduction by the Japanese of suicide tactics which emphasized the need for fighter defense. Because procurement preceded operations for a considerable period, total-on-hand showed an excess of VB/VT aircraft over fighters through January 1944, and the large number of attack types is reflected in the generalized table of distribution above by the assignments to the training command and to logistic support.

CARRIER AIRCRAFT SORTIE RATES

87. Prior to January 1944, carrier based squadrons reported only action sorties: i.e., flights involving action against the enemy. Only after that date is it possible to obtain figures on total flights as well. [23] Quantitatively, this is not a serious omission since the records of action sorties indicate that only 7,381 out of some 116,000 or about 6 per cent occurred before 1 January 1944. Qualitatively, of course, some of the war's most important actions are not included.

83. For squadrons in action aboard fast carriers, the following figures give a summary view for the years 1944 and 1945 during which current carrier task force organization and procedures were developed:

Year	Type A/C	Average No. of A/C	Total flights	Average flights per A/C per mo.	Action Sorties	Average action sorties per A/C per mo.
1944	(12 mos)					
	VF	453	82,035	15	30,733	5.75
	VB/VT	380	39,975	12	21,331	5.9
1945	(7½ mos)					
	VF	838	108,627	17	33,026	5.2
	VB/VT	328	31,820	14	19,257	7.1

[23] Figures for flights and action sorties, 1944 and 1945, are contained in Enclosure D.

89. The nature of carrier operations and the terms in which this information is presented make it necessary that they be fully understood. Action sorties by definition were limited to those involving contact with the enemy. VB and VT aircraft from the nature of their primary function flew a higher percentage of action sorties than did fighters. The latter were employed extensively for combat air patrols, which, while combat missions, did not necessarily lead to contact with the enemy. Increasingly, as the war progressed, fighters took over search and reconnaissance and participated in antisubmarine patrols. Another consideration involves the basic difference between land and carrier based air operations. In land based campaigns, activity could be continuous and fairly constant so long as the enemy remained within range. With carriers, the base itself moved in and out of range. This led to periods of intensive operations followed by others of greatly reduced activity.

90. September 1944 was a month of intensive utilization of planes in action. During 59 CV days and 48 CVL days, an average complement of 539 fighters made 10,033 flights, or an average of 19.4 per aircraft for the month of which over half 5,334, or 9.9 per plane were action sorties. This same month also saw the dive bombers and torpedo planes making 7,509 flights of which 5,154 were action sorties or 16.4 and 11.3 per aircraft, respectively. This may be compared with a month of relative inactivity such as June 1945 when the average fighter aboard carriers in action flew on 10.8 occasions on only 1.6 of which the enemy was encountered; the comparable figures for attack planes were 9.3 and 2.6.

91. The six months from February through July 1945, as shown in Table VI, were a period of frequent and intensive carrier action and may be taken as an example of effort expended by the fast carrier task force at the period of its full development.

TABLE VI

FLIGHTS AND ACTION SORTIES PER MONTH
FEBRUARY-JULY 1945

1945	Type	Av. no. A/C	Total Flights	Flights per A/C	Action Sorties	Action Sorties per A/C	Remarks
Feb	VF	901	11,453	12.7	3,117	3.5	First raids on Tokyo landings on Iwo Jima- strikes against Ryukyu
	VB/VT	326	3,170	9.7	1,235	3.7	
March	VF	1,097*	14,665	13.4	6,107	5.6	Raids on Japan;- Prel. of Okinawa Camp.-
	VB/VT	405	4,481	11.1	3,188	7.9	
April	VF	804	19,808	23.6	6,339	7.5	Land on Okinawa I Apr.- Supp. of Okinawa Camp.- height of kamikaze effort.
	VB/VT	346	4,942	14.3	3,733	10.8	
May	VF	763	14,273	18.7	3,654	4.8	Cont. support of Okinawa campaign; declining Jap. air opposition.
	VB/VT	315	3,679	11.7	2,318	7.4	
June	VF	642	6,926	10.8	997	1.6	Carriers withdrawn from Okinawa for refit and replenishment, 10 June.
	VB/VT	264	2,465	9.3	677	2.6	
July	VF	829	16,220	19.6	5,383	6.5	Carrier strikes against Japan: 10,14,17,18,24,25,28 and 30 July
	VB/VT	339	6,133	18.0	2,949	8.7	

*This figure obviously in error appears in original tabulations prepared from squadron reports.

CONCENTRATING OF AIRCRAFT SORTIE EFFORT ON STRIKE DAYS

92. Strike days may be defined as those days on which carriers launched aircraft to attack enemy targets, either on land or sea. Normally a fast carrier task force was organized into task groups, each of which was capable of independent operation. In a prolonged campaign this made possible the rotation of task groups so that while one was replenishing others might continue pressure on the enemy. Although rare, instances occur of individual carriers retiring for replenishment. The strike cycle was flexible, the most common being 2, 3, or 4 days followed by 1 or 2 days for replenishment. Longer periods did occur and individual carriers operated for as many as 25 successive days.

93. The pattern which the strike cycle often took may be seen in the record of ESSEX off Okinawa in April and May 1945. In the following, S stands for strike day, N for non-strike day, and T for target combat air patrol, an operation which usually involved some offensive action:

USS ESSEX, STRIKE DAY PATTERN, 1945

April 1S 1N 2S 1N 2S 2N 2S 2T 1N 3S 1N 4S 2N 2S 2N 2S
(18 Strike days)

May 1N 4S 1N 1S 1N 6S 2N 2S 1N 2S 1N 2S 1T 2N 1T 3N
(17 Strike days)

94. Typical of carrier task force operations, where task groups sometimes operated independently and sometimes together, was the experience between 29 August and 27 September 1944:

OPERATING SCHEDULE BY GROUPS OF A FAST CARRIER TASK FORCE (X = Strike day)

	TG 38.1	TG 38.2	TG 38.3	TG 38.4
Aug. 29				
30				
31				x
Sept. 1				x
2				x
3				
4				
5				
6	x	x	x	x
7	x	x	x	x
8	x	x	x	x
9	x	x	x	
10	x	x	x	
11				
12	x	x	x	x
13	x	x	x	x
14	x	x	x	x
15	x			x
16	x			x
17				
18				
19				
20				
21	x	x	x	x
22	x	x	x	x
23				
24	x		x	x
25				
26				
27				

95. As noted above, the ESSEX operated 17 strike days one month and 18 another with sufficient flying potential to provide target CAP on still other occasions. In the example from Task Force 38 experience, 2 task groups flew 13 strike days and two others 11. By scheduling the groups, the enemy could be subjected either to constant pressure applied equally over a period or to successive doses of the task force's full power.

96. Sortie rates for strike days were variable. For the first half of 1944 the following rates obtained: 24/

Strike day	Sorties per aircraft per day	
	VF	VB/T
1st	2.3	2
2nd	2	1.6
3rd	1.6	1.2

97. After the third strike day the sortie rate remained constant at 0.6 sorties per day for fighters and 0.4 for attack planes for operations up to 25 days. An average rate of 1.5 per aircraft per day was well within the capabilities of the fast carriers for a typical 3 or 4 day strike period.

DIVISION OF AIRCRAFT SORTIE EFFORT BY PURPOSE

98. Although in general flights by carrier aircraft can be divided only into action and non-action sorties, detail does exist for particular operations. The most complete data concern Task Force 38 between 1 July 1945, when it sortied from Leyte Gulf, and 15 August, when the cessation of hostilities found it off the coast of Japan. During this period aircraft made 23,556 flights. Of these, 18,163 (77 per cent) were flown on strike days and 10,678 (45 per cent) actually attacked enemy targets. 25/

24/ Sortie effort of carrier-based aircraft, OpNav 16-V, No. A89, March 1945, (Covers period January-July 1944)

25/ CTG 38, Serial 00242 of 31 August 1945: Action Report, 2 July - 15 August 1945. (Operations against Japan.)

99. A study of the 23,556 sorties by purpose of flight gives the following:

Purpose of flight	Number Sorties	Percentage of Effort
Offensive against enemy targets	10,678	45
Day Combat Air Patrol	6,366	27
Night Combat Air Patrol	107	0.5
Dawn and Dusk Combat Air Patrol	139	0.5
Radar Patrol Line Combat Air Patrol	1,311	6
Rescue Submarine Combat Air Patrol	744	3
Rescue Aircraft Combat Air Patrol	166	1
Bombardment Group Combat Air Patrol	362	1.5
Spotter Combat Air Patrol	60	0.2
Photographic	990	4
Anti-Submarine Patrol	483	2
Dawn, Dusk, and Night Hecklers	51	0.2
Communications Relay	13	0.1
Search and Weather	198	1
Exercise, training and administrative	1,888	8
	23,556	100

100. The analysis of 23,556 sorties given above and the percentages derived therefrom are useful in gauging the types of flights over a long period at sea. The figures, however, leave some things unexplained, and what would be more significant is the division of effort on strike days. The 10,678 sorties directed against targets do not show all those involving offensive action because some combat air patrols, many of those over the target, for example, concluded by an attack on enemy installations. From this point of view, Task Force 38 reported that for the period of 1 July to 15 August 1945, 12,755 sorties involved some offensive aspect while 5,408 were purely defensive. This would make 29 per cent of the strike day effort defensive. A more careful analysis contained in the report of one of the task groups on this same operation shows that fighters flew approximately 75 per cent of strike day sorties and that 36 per cent of these were defensive.

26/ CTG 38.1, Serial 00111 of 20 August 1945: Action Report, 1 July - 15 August 1945. (Operations off Japan.)

101. Tabulations from the report of Task Group 58.3 in the Okinawa Campaign, including preliminary raids against Japan and the Ryukyus give the same division between offensive and defensive sorties. [27] During the February operations against Tokyo and over Iwo Jima, 28 per cent of the fighter complement was reserved each day for the defense of the Task Force. [28]

MUNITIONS EXPENDITURE BY CARRIER AIRCRAFT

102. In World War II, the fast carriers operated almost entirely in the Pacific where they encountered a major sea power, whose economy was dependent upon maritime communications. Naval and merchant shipping, therefore, presented important targets. Even under these conditions, however, the principal effort was directed against land targets, largely in support of amphibious operations. The following figures illustrate in a general way the volume of ordnance delivered and its division between land and shipping targets:

Type of target	Tons of bombs	Percentage of total	No. of rockets	Percentage of total
Land	28,937	77	77,128	84
Shipping	8,593	23	13,916	16

103. The selection of ordnance naturally reflected this division of effort. The inclusion in Table VI of CVE operations weights the figures somewhat in favor of types of ordnance used against land targets. In 1942 and 1943, however, the expenditure of bombs by CVE's was negligible; in 1944 it amounted to 12 per cent and in 1945 to 19 per cent of the bomb tonnage.

27/ CTG 58.3/38.3, Serial 0069 of 18 June 1945: Action Report, 14 March - 1 June 1945. (Operations in Support of Okinawa Campaign.)

28/ CTF 58, Serial 0045 of 13 March 1945: Action Report, 10 February - 4 March 1945. (First Tokyo Raids, Support of Iwo Jima.)

104. From Table VII, there will be noted an increasing trend towards the 500-pound and 100-pound general purpose bombs, fragmentation bombs, (especially after the introduction of the 263-pound type fitted with proximity fuze), and of incendiaries, with a significant shift to Napalm beginning about the middle of 1944. The decline in the use of the 1000-pound general purpose bomb paralleled the disappearance of the enemy fleet, the decrease in dive-bomber complements aboard carriers, and the subsequent tendency to employ the rocket-equipped fighter-bomber instead. Expenditure of munitions figures for 1944 and 1945 illustrate this development in the fast carrier forces:

Year	Tons of bombs		Number of rockets	
	VF	VB/VT	VF	VB/VT
1944	1,864	17,146	14,584	3,856
1945	4,313	12,171	66,825	9,799

105. Although fighters did not entirely supplant dive bombers and torpedo planes, they increasingly took over functions from the other types. This development was accelerated by the introduction of effective aircraft rockets, and was furthered by the exigencies of the situations which in 1944 and 1945 emphasized destruction of merchant shipping and military installations, both susceptible to rocket attack.

106. This development can also be traced in the loads carried per sortie attacking the target. During the period, January - May 1944, fighters averaged only 0.04 tons of bombs and no rockets, while attack planes averaged 0.6 tons of bombs and 0.16 rockets. By the end of the year a significant change had occurred and the average fighter attacking the target delivered 0.1 tons of bombs and 1.5 rockets. Attack aircraft carried 0.7 tons of bombs and only 0.12 rockets.
The trend continued right to the end of the war. During the assault of July and August 1945 on Japan, the figures for the

TABLE VII

ANNUAL ORDNANCE EXPENDITURES BY ALL CARRIER BASED AIRCRAFT

By Type of Ordnance

CARRIER-BASED

	TONNAGES				PERCENTAGE OF TOTAL*		
	19[illegible]	1943	1944	1945	1942-3	1944	1945
100-lb GP	[illegible]	115	2036	3598	6.5	9.7	16.7
250-lb GP	[illegible]	0	1281	927	0.0	6.1	4.3
500-lb GP	1[illegible]	639	7914	12878	34.9	37.6	59.6
1000-lb GP	2[illegible]	426	3944	1336	29.6	18.8	6.2
2000-lb GP	[illegible]	223	1119	558	9.4	5.3	2.6
500-lb SAP	[illegible]	0	624	160	0.0	3.0	0.7
1000-lb SAP	[illegible]	113	1401	209	4.8	6.6	1.0
Napalm (Tank)	[illegible]	0	118	560	0.0	0.6	2.6
Armor-Piercing	[illegible]	10	264	29	0.4	1.3	0.1
Other Incendiary	[illegible]	26	480	68	1.2	2.3	0.3
Fragmentation	[illegible]	2	335	957	0.4	1.6	4.4
Depth Bombs	[illegible]	50	668	36	2.4	3.2	0.2
Torpedoes	1[illegible]	116	772	292	10.4	3.7	1.3
Mines	[illegible]	0	50	0	0.0	0.2	0.0
Type Unknown	[illegible]	0	46	0	*	*	*
TOTAL	7[illegible]	1720	21052	21608	100.0	100.0	100.0

*Percentages are based on totals of ordnance of known types only.

average fighter on an attack sortie had risen to 0.19 tons of bombs and 2.9 rockets, while the average attack plane carried 0.69 tons of bombs and 0.19 rockets.

SUMMARY OF DESTRUCTION TO JAPANESE AIRCRAFT AND SHIPPING

a. Aircraft

107. Destruction of records has made impossible exact accounting for Japanese aircraft. Claims by United States air forces totaled 25,816 [29] divided as follows:

Air component claiming destruction	In air	On ground	Total	%
U.S. Navy/Marine Corps carrier based	6,484	5,854	12,338	48
U.S. Navy/Marine Corps land based	2,807	328	3,135	12
U.S. Army Air Forces	7,362	2,981	10,343	40
TOTAL	16,653	9,163	25,816	100

108. The Strategic Bombing Survey, after reviewing existing material and interviewing numerous Japanese officers, came to the conclusion that 20,000 would be a better figure for combat losses. [30] From this must be subtracted a certain number of Japanese aircraft shot down by allied air forces and by ship and ground AA. Although the claims may be as much as twice the number actually destroyed in combat, the significance of the figures above lies in the relative achievement of the various United States air forces involved. Not necessarily. Samuel Eliot Morison excoriates USA Gen. Kenney for as exaggerated claims. Navy claims may have been more or less inflated.

29/ OpNav, some statistics on U.S.Navy Carrier Aircraft, Confi., Table B. Office of Statistical Control, Army Air Forces [illegible], p. [illegible].

30/ USSBS, Japanese Air Power, 1946, p. 30.

b. Naval Vessels

109. The Joint Army-Navy Assessment Committee which studied Japanese naval and merchant shipping losses credited carrier based aircraft with sinking 161 enemy naval vessels of 711,236 standard tons. If ships shared with other agents are prorated among them, the carriers share becomes 168 vessels totalling 778,200 tons. U.S. submarines accounted for 201 ships totalling 540,192 standard tons. Although antishipping attacks were not a primary mission of Army aircraft, land-based air - Army, Navy, and Marine - sank directly 81 naval vessels aggregating 75,567 tons. Mines laid by Army aircraft accounted for another 16 naval vessels of 13,670 tons. Others disposed of by land-based aircraft in collaboration with other agents brings the total credited to land-based aircraft to something over 100,000 tons. The 168 ships destroyed by carrier aircraft averaged 4,629 tons and included 5 battleships, 11 carriers, 11 heavy and 8 light cruisers, 31 destroyers, and 11 submarines.[31/] Although the Joint Assessment Committee did not allocate actual sinkings between fast and escort carriers, the division as estimated from a comparison of sinking and carrier positions was 93 per cent for the CV-CVL's or 152 enemy naval vessels of 722,000 tons, and 7 per cent or 16 vessels of 56,000 tons for the CVE's. In attacks on naval vessels, carrier aircraft sank about 210 tons of such craft per ton of ordnance expended.

31/ Joint Army-Navy Assessment Committee, Japanese Naval and Merchant Shipping Losses during World War II by all causes, (NavExos P-468), Washington, 1947.

c. Merchant Shipping

110. The United States Strategic Bombing Survey in its report on the War Against Japanese Transportation stated among its conclusions:

> Carrier-borne air attacks, when directed against large concentrations of merchant shipping, were by far the most devastating attacks of all. They were, however, sporadic and not part of a continuing program to neutralize enemy shipping lanes. In general, the responsibility of carrier air was presumed to lie elsewhere and to relate more directly to naval operations... However, when carrier air went into an area Japanese shipping there was completely disorganized and movement virtually ceased for a time. 32/

111. Carrier aircraft destroyed 359 merchant vessels of 1,390,959 standard tons, more than any agent except submarines whose bag was greater than that of all other agents together. About 97 per cent of that sunk by carrier air was credited to CV - CVL's. Other measures of effectiveness may be indicated by results per sortie and per ton of ordnance expended: 33/

JAPANESE MERCHANT VESSEL SINKINGS BY AGENT

	Tons of Shipping Sunk per Sortie attacking	Tons of Shipping sunk per ton of ordnance expended
Carrier-based aircraft	76.4	257.6
Army-Navy-Marine land-based aircraft	84.8	67.5

32/ USSBS, The War against Japanese Transportation, Washington, 1947, p.7.

33/ Ibid.

VI.

LOSS AND DAMAGE TO UNITED STATES FAST CARRIER TASK FORCES

CARRIERS

112. During World War II, the Navy lost 4 fleet carriers in 1942 and one light fleet carrier, PRINCETON, in 1944. From the lessons in the first year of conflict, the Navy improved its fire fighting equipment, damage control methods, and training of crews, all of which resulted in reducing the effect of bomber and suicide planes hits on ships. Enclosure B describes each case of battle damage to United States fleet carriers in World War II.

113. At Pearl Harbor (where no carriers were present during the attack) the Japanese employed 1,575 lb. AP bombs against warships, in addition to smaller bombs and torpedoes. Subsequent to Pearl Harbor, however, no hits by large Japanese bombs are known, and bomb hits on U.S. warships were usually by 550 lb. SAP bombs, and occasionally by 130 lb. GP bombs. The bomb hits mentioned in the following discussions may, therefore, be assumed to have been from 550 lb. or 130 lb. types, predominantly the former.

114. LEXINGTON was hit by two bombs and two or three aerial torpedoes after which she continued in action for approximately three hours until the gasoline fires in the lower deck spaces got out of control. In this case she might have been saved had proper salvage facilities existed. The ship was finally sunk by torpedoes from accompanying destroyers.

115. YORKTOWN was hit by three bombs, two aircraft torpedoes, and finally sunk by two submarine torpedoes three days later. After bombing, she continued to operate her planes for approximately two hours until hit by the aircraft torpedoes.

116. HORNET was struck by five bombs, three aircraft torpedoes, and two kamikaze crashes. After having been abandoned, nine destrouer torpedoes plus gun fire were fired into her without taking the ship down. Four more torpedoes from Japanese destroyers were required to sink the ship. This was a total of five bombs, two suicidal crashes, and sixteen torpedoes, plus gunfire.

117. WASP, a lightly constructed pre-war carrier of only 14,700 tons, was struck by two or three submarine torpedoes which set off bombs in her magazine, started heavy fires, and caused explosions of bombs and torpdoes among planes on the hangar deck. This fire and destruction was under control until three gasoline vapor explosions occurred below decks, after which it was decided to abandon and sink the ship by torpedoes from friendly destroyers. WASP, like the LEXINGTON, was a victim of her own faulty gasoline system.

118. PRINCETON, a 10,000-ton CVL built on a cruiser hull, was the only other fast carrier sunk during World War II. She also was a victim of fire which raged out of control among armed and gassed planes on the hangar deck until the bomb stowage aft exploded, destroying the after section of the ship above the water line and causing severe damage to the cruiser BIRMINGHAN which was alongside at the time. After this, it was decided that PRINCETON was not worth saving and she was sunk by friendly forces.

119. In the remaining 37 cases of hits on carriers there was only one where damage resulted from a combination of causes: that of SARATOGA struck February 21, 1945 by four kamikazes and two bombs. She received these hits over a period of an hour and 45 minutes and suffered extensive fires and severe structural damage, but an hour and one-half after the last hit was again ready to land aircraft. It required ten weeks to repair this damage.

120. On only two occasions were carriers struck by submarine torpedoes alone. In both cases it happened to the SARATOGA. This left 34 cases, in 14 of which carriers received one or more bomb hits. Three carriers were struck by aircraft torpedoes, and in 17 instances by suicide aircraft or kamikazes.

121. Much new equipment, armament, etc., was developed during the course of World War II. Experience with ships also indicated the desirability of incorporating many structural alterations. The general policy was therefore adopted of incorporating these alterations and installing newly developed equipment when it became necessary to return ships to Navy Yards either for repair of battle damage or for other overhaul. The Bureau of Ships has examined wartime records which show that the proportion of man-hours expended on battle damage as compared to total time under repair varied from 35 per cent to 65 per cent with an average of about 50 per cent expended in repair of battle damage. This factor has been incorporated into the times shown hereafter for repair of battle damage, but Enclosure B includes the figure for total time in yard under "duration of overhaul and repair."

122. FRANKLIN is excluded from cases of bomb damage partly because her experience is special since she was hit at the most crucial momemt when she had planes ready to launch, all fully fueled and armed, but mainly because she was damaged so near the end of the war that her repair received a low priority and was delayed beyond the conclusion of hostilities. It is therefore impossible to tell for statistical purposes how much time would have been required to put her back into action had there been real compulsion to do so. In 13 cases (excluding FRANKLIN) a total of 25 bombs caused damaged which required 7.5 weeks to repair, or approximately an average of 0.3 weeks of repair work

required for each bomb hit. It should be noted, however, that in 8, or 60 per cent of the total cases of bomb hits there was insufficient damage to the ship to require overhaul or repair. From this it can be seen that in the cases were repair was necessary ten bomb hits required 7.5 weeks of repair, an average of approximately 0.75 week per bomb hit, but in about 60 per cent of the cases, bomb hits did not cause sufficient damage to require withdrawing the ship from action.

123. It is of interest to note that in the two cases in which aircraft torpedoes scored hits the big carriers required an average of 2.5 weeks repair time thereafter, whereas the light carrier INDEPENDENCE required 24 weeks of repair after a hit aft which knocked out three of her shafts and caused extensive flooding aft.[34/] In case a large carrier were struck in the same spot as was the INDEPENDENCE, it might be reasonable to expect that she would suffer somewhat similar damage and therefore the repair time for aircraft torpedo hits would average about 11 weeks per hit including, however, the man-hours also devoted to alterations and installation of new equipment. The question of torpedo hits, however, is a special one since the location of the hit is extremely critical in assessing the amount of damage which will be done, hits aft on the rudder or propeller shafts being by far the most danagerous.

124. The case of SARATOGA may throw some light on the subject of submarine torpedo hits considered alone since she was the only carrier damaged and not sunk by submarine and SARATOGA was hit twice. The first time she was hit at night while she was not operating aircraft but was able to increase speed and

34/ Records were not available on this case but it seems probable that nearly the full 24 weeks shown in Enclosure B may have been required for repairs.

could have continued in operation had she been in action. After this hit she returned to Pearl Harbor where temporary repairs were made and then went back to the Navy Yard, Puget Sound, for permanent repairs and modification by the installation of blisters which had been previously scheduled. It is impossible to say therefore how much time would have been required to simply repair the damage. In the case of her other hit, the ship lost power as a result of electrical fires five minutes after being struck, but was back in commission and operating planes approximately three and a half hours later. Her repairs required seven weeks after this hit for battle damage alone.

125. All the above is in striking contrast to the damage done by kamikazes. There were 17 cases in which kamikazes, unaccompanied by other forms of attack, hit carriers. In five of these cases two kamikazes hit the same ship making a total of 22 kamikaze hits. In six cases of kamikaze attack, the carrier continued in action and in five did not require overhaul later. The 12 incidents of kamikaze hits necessitating yard repair required an accumulative repair time of 80 weeks, of which it is assumed 40 was for repair of battle damage for an average of 2.5 weeks per hit requiring repair. In the case of kamikaze hits, therefore, the ship suffered no damage requiring yard repair in about 30 per cent of the cases; but where damage sustained was sufficient to need repair, approximately 2.5 weeks per hit was required. Kamikaze hits were roughly three times as effective in putting ships out of action as were conventional bombs as measured by time required for repairs, although no case did kamikaze attacks result in the loss of a carrier by sinking. It also seems significant to note that in bombing attacks, the ship had a 60 per cent chance of avoiding serious damage even though hit, whereas in the case of kamikaze attacks this figure becomes 30 per cent.

126. To the fleet commander not the weeks in the yard but the total elapsed time during which the damaged carrier will be unavailable is important. This time out of action may be defined as the time between the date on which the ship was withdrawn from action and that on which it again reported to a fleet command. Excluding cases involving carriers insufficiently damaged by bombs to require yard repair, the average time out of action was 1.9 weeks per hit. Kamikaze hits proved more serious and, and again excluding cases in which withdrawal was not necessary, the average time from withdrawal to return was 5.6 weeks per hit. Torpedo damage proved the most costly of all and forced an average time out of action of 12.4 weeks for hits by submarine torpedoes and 17.5 weeks for hits by aerial torpedoes.

127. The damage experience of United States carriers is summarized in Table VIII.

128. Wartime experience indicates that carriers may be sunk by cumulative damage from successive hits, i.e., by weight of attack, or from one or more hits which strike at a time and in an area where the vessel is particularly vulnerable, i.e., by chance. The principal cause of loss and damage was fire. A bomb or suicide plane striking a carrier almost always resulted in fire and the difficulty encountered in limiting damage depended upon the condition of the ship at the time and on the location of the hit. If the missile struck when the gasoline system was open, or when fueled and armed aircraft were parked on the flight [illegible] was considerably increased. The resultant effect depended in large part on the area in which the missile detonated. If the explosion ruptured the gasoline system or set fires among parked aircraft, the result could be extremely serious, going up to complete loss of the carrier as in

TABLE VIII

CASES OF DAMAGE TO U.S. FAST CARRIERS

WORLD WAR II*

Agent causing damage	Cases by No. of hits per attack 1 2 3 4 5	Immediate Effect: Ship cont. in operation	Immediate Effect: Temp. out of action	Immediate Effect: Out of action	Cases req. rep. overhaul	Average** No. of weeks in yard per hit	Average No. of*** weeks out of action per hit	Total cases
Submarine Torpedo	2	1	1		2	7	12.4	2
Aerial Torpedo	3			3	3	11	17.5	3
Aerial Bombs	8 1 2 1 1	10	2	1	5	0.3	0.7	13
Kamikaze	12 5	6	5	6	12	1.8	4.3	17
Kamikaze and Aerial Bombs	One case involving 4 kamikazes and 2 bombs		1		1	5****	13.****	1
Totals		17	9	10	23			36

*Excluding damage to FRANKLIN on 19 March 1945.

**Except for damage from submarine and aerial torpedoes, the figure includes only time required for repair of battle damage but not time employed in overhaul, installation of new equipment, and repair of non-battle damage. Because of insufficient evidence, total time in yard is given for damage by torpedoes.

***Includes total time in yard.

****Time for the incident, rather than per hit.

the case of PRINCETON. During World War II, the Navy reduced the danger by improvements in equipment and in damage control techniques, but, so long as carriers operated within range of enemy attack, they incurred the risk of serious damage and even of loss.

SUPPORTING VESSELS

129. The other vessels in fast carrier task forces suffered less from loss and damage than did the carriers. They also suffered no more than similar vessels assigned to other kinds of fleet employment involving combat. This favorable experience resulted from 3 principal causes: (1) the emphasis of enemy attacks upon carriers rather than support vessels; (2) the constant proximity of friendly aircraft from the carriers which broke up incoming raids; (3) the high concentration of anti-aircraft fire in a fast carrier group. No battleship or cruisers were sunk, and only 4 destroyers were lost, all in 1942. For 7½ months of 1945, during which the carriers were engaged intensively, except in June, no support ships were sunk and the following damage was received:

Type	Average number assigned	Total number of hits
BB/CB	9	8
CA	3	1
CL	11	1
DD	63	19

130. Comparison with damage to similar types engaged in other fleet employment is difficult to establish. Few vessels, outside fast carrier forces, were so continuously engaged in operations within such close range of the enemy. It is significant, however, that of all the other ships in commission of the types considered above, 24 per cent were damaged during the same period as compared with 34 per cent of those assigned fast

carrier task forces. As this includes many cruisers and destroyers which were in the Atlantic or other areas where there existed practically no chance of damage from enemy action, a number of vessels used for training, and still others on shakedown or in repair and overhaul, it appears reasonable that battleships, cruisers, and destroyers assigned to screen fast carriers enjoyed greater immunity from damage than similar vessels engaged in operations involving anything like comparable contact with the enemy.

CARRIER AIRCRAFT

131. During the war, the United States Navy lost 4,056 fighters and 2,723 attack planes either flying from or aboard all types of carriers engaged in all types of activity.[35/] These figures may be analyzed in various ways. First by general cause of loss:

	Type of Aircraft			
	VF		VB/VT	
Cause of loss	No.	Per cent	No.	Per cent
Enemy action	1463	36.1	1025	37.7
Combat not enemy action	30	0.7	30	1.1
Action of own forces	128	3.1	91	3.2
Operational accidents	2390	58.9	1547	56.8
Other	45	1.2	30	1.2
Total	4056	100.0	2723	100.0

132. Second, by type of flight on which loss occurred:

	Type of Aircraft			
	VF		VB/VT	
Type of flight on which loss occurred	No.	Per cent	No.	Per cent
Combat mission	2375	58.6	1772	64.7
Search and reconnaissance	205	5.1	262	9.6
All other flights	703	17.3	477	17.5
Not in flight	773	19.0	512	18.8
Total	4056	100.0	2723	100.0

133. Operational accidents provided the majority--about 58 percent--of losses when classified by cause. Losses were, therefore, closely related to number of sorties but fluctuations,

35/ Complete loss figures may be found in A[illegible]

owing to other factors, did exist. It is interesting to note in this connection that the greatest number of operational accidents, 397, occurred in October 1944 when squadrons in action flew 17,500 sorties and that in April 1945 with about 25,000 sorties there were only 241 such accidents.

134. When analyzed by the type of flight on which the loss occurred, it will be noted that slightly under 60 per cent of all aircraft losses took place on combat missions, i.e., those having as their objective contact with the enemy. Since the data used above relate to all flights from all carriers regardless of type and employment, they do not apply specifically to fast carrier task forces, or only to operations in strike areas. It has not been possible to differentiate losses between squadrons based on fast carriers from those on CVE's, but differences in loss rates do not appear to have been significant. Table IX analyzes World War II losses on combat missions from all types of carriers.

135. The following brief resume shows the relative importance of different types of losses on combat mission:

Cause of loss	VF		VB/T		Total	
	No.	%	No.	%	No.	%
Enemy action	1078	28	756	20	1834	48
Operational	1221	32	656	17	1877	49
All others	76	2	60	1	136	3
	2375	62	1472	38	3847	100

136. The agent causing losses to enemy action confirms the concentration upon land targets indicated previously. For the whole war they were as follows:

TABLE IX

LOSSES BY CARRIER AIRCRAFT ON COMBAT MISSION BY CAUSE OF LOSS

Cause of Loss	Dec 41-June 42		July-Dec 42		Jan-June 43		July-Dec 43		Jan-June 44		July-Dec 44		Jan-June 45		July-Aug 45		TOTAL	
1. Enemy Action	VF	VB/T	VF	VB/T	VF	VB/T	VF	VB/T	VF	VB/T	VF	VB/T	VF	VB/T	VF	VB/T	VF	VB/T
a. Aircraft	1	59	29	16	2	1	22	11	54	9	69	11	101	4	11		302	107
b. Ships AA		19	12	8			2	3	4	7	39	92	16	46	11	13	84	188
c. Land AA		8	5	1		1	23	15	99	76	190	138	274	144	100	54	691	457
d. Other		1								1		1	1	1			1	4
Total by enemy action	1	87	46	25	2	2	47	29	157	93	298	242	392	195	122	67	1078	756
2. Operational Loss																		
a. Mechanical Fail.		3	6	6	1	1	18	8	28	23	87	61	190	56	23	15	354	173
b. Pilot Failure		3	4	9	5	2	15	12	28	18	90	35	266	42	31	16	440	137
c. Fuel Exhaustion	1	23	14	12		1	2		5	63	27	49	41	15	10	4	114	167
d. Other & Operational		4	6	4	8	1	4	13	38	44	67	29	160	67	26	7	308	179
Losses	2	33	30	31	14	5	39	33	99	148	271	174	657	180	90	42	1221	656
3. In combat not enemy actio.																	30	30
4. Accidental actions, own forces																	36	14
5. Missing, cause unknown																	10	16
																	2375	1472

Agent	VF No.	VF %	VB/T No.	VB/T %	Total No.	Total %
Aircraft	302	28	107	14	409	22
Ships AA	84	8	188	25	272	15
Land AA	691	64	457	61	1148	63
Other	1	-	4	-	5	-
	1078	100	756	100	1834	100

137. The data employed up to this point are derived from a complete accounting of all naval aircraft in which each is identified by Bureau Number and its cause of loss or disposition recorded.[36] Other figures based on action reports indicate that in 1944 and 1945, 91 per cent of actual losses of carrier based aircraft occurred among squadrons in action. This makes possible the summary of loss rates by type of flight within a margin of error of about 10 per cent. Such rates have been computed and set forth in Table X for months of extensive operation and relatively high loss.

138. In all except one of the months selected, loss rates for attack types on combat missions exceeded that for fighters. This is reasonable on the basis of the point advanced previously that attack planes flew a higher percentage of action sorties than did fighters.

139. Prior to January 1944 Navy squadrons did not report total flights. It is therefore impossible to compute loss rates comparable to those in Table X for the early war period. Action sorties (those resulting in actual contact with the enemy) however, were recorded and an indicative comparison may be made by reckoning losses per 100 action sorties:

Period	To AA	To A/C	Oper.	Total
1942	1.7	4.5	0.2	6.4
1943	1.1	0.2	0.6	1.9

36/ See Enclosure D.

TABLE X

LOSS RATES PER 100 SORTIES, SELECTED MONTHS OF 1944-1945, INDICATING PROPORTION BY TYPE OF FLIGHT

	VF				VB/T			
	Combat Mission	Search & Recon.	All Others	Total	Combat Mission	Search & Recon.	All Others	Total
1944								
June	1.30	0.04	0.18	1.52	1.80	0.05	0.25	2.10
Sept	0.56	0.06	0.15	0.27	0.64	0.15	0.18	0.97
Oct	1.54	0.21	0.20	1.95	2.35	0.26	0.29	2.90
1945								
Jan	1.16	0.08	0.12	1.36	1.59	0.23	0.01	1.73
Mar	1.25	0.03	0.18	1.46	1.35	0.16	0.15	1.66
April	0.80	0.03	0.03	0.86	0.73	0.09	0.05	0.87

VII.

FOREIGN CARRIER FORCES

140. Other than the U.S. Navy, only the British and Japanese possessed carriers in significant numbers. Various facets of their operations will be discussed in connection with specific problems elsewhere in this study. No general analysis of the size, composition and utilization of their carrier forces and aircraft has been made because sufficient material is not readily available and because its value to this report is peripheral.

BRITISH CARRIERS

141. The Royal Navy employed during the war 11 fleet, 5 light fleet, and 45 escort carriers. The first 2 categories had armored flight decks but were small, 23,000 and 14,000 tons, respectively, compared to United States fleet carriers.

142. Although the first navy to experiment with carriers, the British had by 1927 dropped behind the United States and Japan. In 1918 the Royal Naval Air Service had been merged with the Royal Flying Corps to form the Royal Air Force. A cabinet decision of 1937 returned the Fleet Air Arm to the Admiralty and the transfer became effective in 1939, a few months before the outbreak of war. During the period of RAF control the development of naval aircraft had been neglected. Many pilots temporarily assigned naval duty regarded themselves largely as chauffeurs, a tendency encouraged by the extensive use of naval officers as observers. When the separation came, the RAF withdrew numerous pilots and practically all trained main-[illegible] left the Admiralty with a large task of reorganization on its hand which had scarcely gotten underway when hostilities broke out. The British Government decided for obvious reasons to give the RAF priority in development, production, personnel, and training.

143. The Royal Navy entered the war inexperienced in aircraft problems. Its plane types were in many cases obsolescent, and few of them well-designed for carrier operation. There were for example only manually operated folding wings on British carrier planes, which slowed deck-handling, and a large number, even of fighters, were two-place aircraft. Since all development was concentrated in the RAF, the Fleet Air Arm could not improve upon what it had except by acquiring RAF types and attempting to modify them for carrier work, a procedure which never proved satisfactory. The carriers themselves were not standardized, and aircraft which could be accommodated on one could not always be handled on another. Complements therefore varied considerably from ship to ship and lack of deck-edge elevators decreased rapidity of take-off and landing.

144. The Royal Navy faced difficulties which required time to solve, but, lacking time, it turned to the United States for assistance. For its operations during 1944 and 1945 in the Pacific the British Fleet took over many United States procedures and to a large extent United States equipment. Although an improvement, even this did not prove completely satisfactory. TBF's for example could not carry British aerial torpedoes, and the F4U could not be accommodated on some British carriers. It was not until after the war that the Admiralty received funds for aircraft development, and in 1950 the first British plane types designed expressly for carrier operation began to appear. The reorganization so long delayed was becoming a reality.

145. In the early part of the war, the British occasionally employed carriers for hit and run raids on enemy objectives and for operations with the fleet. The main concentration, however, was on the defense of trade and the escort of military convoys, especially in the Mediterranean. It was in this area that the

first efforts occurred to adapt RAF techniques of fighter direction to carrier operations. The experience here accumulated became available to the United States Navy and laid the basis for its successful development along these lines.

146. So long as the British faced only the Italians, their carriers moved freely through the Mediterranean. With the coming of the Germans in January 1941, the situation abruptly changed and within 6 months the Roayl Navy withdrew its carriers from the eastern part of that sea, but continued to operate them from Gibraltar. From its experience up to this time the Admiralty determined to obtain single seat fighters, to operate several carriers simultaneously, and to improve radar equipment and its use.. Early in 1942 the situation on Malta became so critical that supplies had to be run in even at considerable cost. This led to a number of convoy operations of which the most important was PEDESTAL. As in the others, carriers accompanied the convoy and gave air protection until off the coast of Tunis, at which point the carriers turned back toward Gibraltar. The convoy was then expected to slip along the African Coast under cover of darkness and to pick up air cover by long-range Beau-fighters from Malta. To PEDESTAL the British assigned 3 carriers--EAGLE, INDOMITABLE, and VICTORIOUS--with a total of 72 fighters and 28 torpedo planes. EAGLE was torpedoed by a U-boat before coming in contact with enemy air, thus reducing the number of fighters to 60. Within range of the convoy the Axis had 218 German and 387 Italian aircraft. Attacks began on the evening of 11 August 1942 and continued until the carriers turned back according to plan at 1900 the following day, during which time an estimated 132 enemy planes were encountered. In all, 7 attacks were made, 4 of between 20 and 30 aircraft, 2 of about 10, and the other consisting of 2 lone Italian planes.

The result of this effort was 1 torpedo hit on a cruiser, which proved fatal several hours later, a bomb hit on INDOMITABLE, easily brought under control, and a dud which bounced off the deck of VICTORIOUS. Defending British fighters accounted for 8 confirmed and 3 probables. Perhaps more important, they broke up several coordinated attacks and drove off others before they reached the force. No cargo vessel was hit and only one received damage as the result of a near miss. After the carriers withdrew the convoy suffered from skillfully coordinated attacks by submarines, Italian E-boats, and German aircraft as a result of which only 5 of 14 cargo vessels reached Malta.

147. These early British carrier operations did not resemble those of United States fast carrier task forces. The carriers and their aircraft were tied to a convoy and conducted purely defensive missions, making no attempt to reduce enemy air power by attacks on his airfields or other installations. Not until late 1944 did the Fleet Air Arm engage in task force operations at all similar to those of United States carriers and by that time the British had adopted much United States equipment and many of its procedures. Although in some respects comparable to United States operations, the Royal Navy never achieved the same efficiency for reasons previously indicated.

148. Armored flight decks proved effective against kamikazes. Although six incidents of kamikaze hits occurred, in none was the carrier forced to retire and the longest time required to effect temporary repairs was 5 hours. The British lost 5 fleet carriers during the war, 3 to submarine torpedoes, one to surface fire and one to Japanese carrier aircraft. The last 2 were rather exceptional. On 6 June 1940, GLORIOUS encountered superior German naval units in the North Sea.

Burdened with a deckload of Hurricanes which it was ferrying from Norway, unable to fly aircraft, and in poor weather, GLORIOUS was literally helpless. HERMES, a light fleet carrier, put hastily to sea without aircraft to avoid being caught in harbor by an approaching Japanese carrier force. When it was discovered, enemy aircraft overwhelmed it.

149. The danger of submarine torpedo hits was reaffirmed by British experience. EAGLE was sunk in 1942 by 3 torpedoes while engaged in Mediterranean convoy operations. ARK ROYAL received a single submarine torpedo on 13 November 1941 and was taken in tow. It proved impossible to check the resulting leaks and the ship sank the following day. Caught in the first month of the war, COURAGEOUS went down within 15 minutes of being struck by an undetermined number of submarine torpedoes. Except for ARK ROYAL the sinking of British carriers confirms United States experience. As will be seen in discussing Japanese losses, for a CV or CVL to go down after one torpedo hit was as exceptional as the loss of PRINCETON from a single bomb. Damage to British carriers reveals the same general results as that for similar United States ships, except for the superiority of armored flight decks in reducing the effects of kamikaze and light bomb hits. The British lost no fleet or light carriers after 1942.

150. The Royal Navy developed considerable skill in aerial mining from carriers. The Norwegian Leads presented an area where a few well-placed mines could cause the enemy a maximum of difficulty. Until the mines were swept, German shipping had the choice of suspending its activity or of going into the open sea where it risked sinking by British submarine and surface units.

152. The following tabulation gives the figures on 10 attacks for which complete information is available:

BRITISH AERIAL MINING BY CARRIER AIRCRAFT

Sorties by Mine-laying A/C	Mines laid	Fighter Escorts	Losses	
			Minelayers	Escorts
18	17	16	1	1
11	11	11	0	0
11	11	11	0	0
8	7	16	0	0
12	10	14	0	1
12	12	16	0	0
12	11	16	0	0
7	5	16	0	0
9	7	16	2	0
8	7	20	0	0
108	98	152	3	2

153. Accuracy was considered good, all mines reported as falling in the designated channels and with an error under 100 yards along the line of advance and in deflection even less. Experience led the British to provide 2 fighter escorts for each minelayer when possible. All losses were to AA fire.

154. Because the purpose of this effort was to hinder rather than to sink shipping, exact measures of effectiveness are lacking. Postwar information showed that results had been good in delaying shipments of iron ore and essential oils and in tying up mine sweeping equipment, AA guns, and troops, all of which might have been used to hinder other Allied operations.

JAPANESE CARRIERS

155. On 7 December 1941, the Japanese had 9 fast carriers. During the war, they commissioned 11 more, including SHINANO, of 63,000 tons, the largest carrier ever built. Of this total of 20, U.S. carrier aircraft alone sank 10, submarines accounted for 4. Another 2 were destroyed by a combination of agents. The remaining 4 were found at the end of the war in Japanese home waters, all damaged. Table XI shows the losses suffered by Japanese carrier forces and the agent, or agents, responsible for each sinking.

TABLE XI

JAPANESE CARRIER LOSSES*

Carrier	Bombs	Aerial Torpedo	Other	Remarks
AKAGI	4 or more			Fire among aircraft. Torpedoed by Jap DD.
KAGA	4 or more			Fire among aircraft.
RYUJO	Several	Several		-
SORYU	Several			Fire among aircraft.
HIRYU	Several			Fire, sunk by Jap DD.
SHOKAKU			3 SS Torpedoes	Fire.
ZUIKAKU	Many	Many		Weight of attack.
HITAKA		1	1 SS Torpedo	Both hits on same side.
TAIHO			1 SS Torpedo	Damage control performance extremely poor.
SHINANO			4 SS Torpedoes	Being transferred with skeleton crew; not entirely completed.
UNRYU			2 or more SS Torpedoes	
AMAGI	2 plus many near misses			Sunk at Kobe, mining effect of near misses.
ZUIHO (CVL)	Many	Many		Weight of attack.
SOHO (CVL)	Several	Many		Weight of attack.
CHITOSE (CVL)	Many	Some reported.	Cruiser fire	Weight of attack.
CHIYODA (CVL)	No details	No details		U.S. carrier pilots claimed numerous bomb and torpedo hits.

*Details may be found in U.S. Naval Technical Mission to Japan, Ships and Related Targets, Index No. S-06-1, 2, and 3.

156. Two engagements stand out--Midway in 1942 and Leyte in 1944--in each of which the Japanese lost 4 carriers. In the first, they were caught refueling and rearming aircraft, which increased the likelihood of a hit causing extensive damage. All 4 carriers suffered from uncontrollable fires and explosions which forced crews to abandon ship and either sank the vessels directly or made them floating hulks to be finished off by their own screen.

157. At Leyte Gulf, because they lacked trained aircrews, the Japanese deliberately chose to sacrifice their carriers as decoys to draw U.S. forces northward from the main area of action. These carriers had, practically speaking, no aircraft embarked for airborne defense and were attacked at will until they went down, 3 sinking from air attack alone, while the fourth went down after U.S. cruisers worked it over. The only instance during the war of a Japanese carrier being lost as the result of a single torpedo hit, was attributed to faulty design and "extremely poor" damage control.

158. Even in the first year of the war, the United States carrier forces had the better of the conflict, destroying 6 enemy carriers for a loss of 4. When the duel between the two forces was resumed in 1944, United States superiority was marked. The new ESSEX- and INDEPENDENCE-class carriers were more efficient and less vulnerable than their Japanese counterparts. The F6F and F4U fighter planes were not only better than the F4F's which they replaced but showed a marked advance over anything the enemy possessed. The Japanese had, at the same time, failed to initiate a sufficiently expanded training program to replace their original air groups. The result was a decline in average pilot skill. Radar and communications equipment were not up to United States standards, and finally, when attacked,

Japanese operating doctrine continued to call for each ship to take independent action, which--far from protecting the carriers--laid them open to attack.

159. These weaknesses proved fatal when a Japanese carrier force challenged Task Force 58 on 19 and 20 June 1944. In a single engagement they lost about 400 aircraft and a fast carrier to air attack and 2 more carriers to U.S. submarines. Lacking trained pilots, the Japanese utilized their carriers in October 1944 as decoys. After that, they were not further employed, although some effort was continued to complete construction of additional ships and to train more carrier pilots. What was left of Japanese carrier aviation was either expended in 1945 from land bases in suicide attacks or was being saved to resist the invasion of the home islands.

ENCLOSURE A

SIZE OF JAPANESE AIR FORCES AVAILABLE TO OPPOSE FAST CARRIER TASK FORCES

1. Statistical information on Japanese air forces during the war in the Pacific is unsatisfactory. Records in many instances are non-existent and in others fragmentary. Recollections of Japanese officers, as recorded in postwar interrogations, are incomplete and often contradictory. The best available source appears to be United States intelligence estimates which, while not exact, are believed to be sufficiently correct to indicate the general size of the forces encountered. The following figures were adapted from the estimates given to the fast carrier task forces just previous to each operation.

2. Table I summarizes information concerning Japanese aircraft available in certain areas of fast carrier task force operations. Aircraft described as in the area represent those already at bases from which they could attack the task force at some time during the operation without change of base and without regard to their possible commitments against other U.S. forces. Reinforcements are taken to be those aircraft in combat units stationed sufficiently close to the area of operations so that they might readily be brought up. Where possible relevant information has been introduced from other sources and particularly from two publications of the United States Strategic Bombing Survey.[1/]

3. The operations were selected on the basis of their importance and the quality of the available material.

1/ Japanese Air Power, Washington, 1946. The Campaigns of the Pacific War, Washington, 1946.

TABLE I

INTELLIGENCE ESTIMATES OF JAPANESE AIRCRAFT AVAILABLE IN AREAS OF FAST CARRIER OPERATIONS, WORLD WAR II

Marshall Islands Campaign, 29 January-17 February 1944

	VF**	VB**	VBM**	VP**	VSO**	Total
Aircraft in the area	80	12	45	8	17	162
Reinforcements						
Truk*	186	198			20	405
Marianas	60	—	48	—	—	108
Total	326	210	93	8	37	675

* Carrier raids were conducted on Truk, 16-17 February 1944. From pilot reports and photographs an estimated 315 aircraft was counted. Postwar interrogation of the commanding officer yielded a figure of 365.

** VF-Fighter; VB-Carrier-type bomber; VBL-Light Bomber; VBM-Medium bomber; VP-Patrol plane; VSO-Scout observation.

Western Carolines Raid, 30 March-1 April 1944

	VF	VB	VBM	VP	VSO	Total
Aircraft in the Area	60	35	35	3	12	145
Reinforcements*						
Carolines	215	110	55	7	58	445
New Guinea**	—	—	—	—	—	400
Total	275	145	90	10	70	990

* An unknown number of reinforcements were flown into Palau on the night of 30 March.

** Only the total given, no analysis by types. No mention made of possible reinforcements from the Philippines. Intelligence sources estimated that the Japanese would not commit their aircraft from the Marianas, which are, therefore, not included.

TABLE I (Continued)

Marianas Campaign, First Phase, 11-20 June 1944*

	VF	VB	VBL	VBM	VP	VO	Total
Aircraft in the area**	186	48	82	15	6	16	353
Reinforcements***							
Palau & Yap	52	24	-	9	2	12	99
Other Carolines	42	12	-	6	-	6	66
Philippines, N.E.I., New Guinea	70	16	-	61	2	68	217
Empire	250	120	80	55	10	35	550
Carrier Groups	242	221	-	-	-	-	463
Total	842	441	162	146	20	137	1748

* The Marianas Campaign lasted until Guam was secured on 10 August. Air action, however, virtually terminated with the repulse of the Japanese fleet on 19-20 June.

** Postwar interrogations show approximately 570 aircraft in the Marianas on 1 June 1944. Half of these were shifted to Biak because of a faulty estimate of the situation. It is not known whether any replacements arrived before the opening of the campaign on 11 June.

*** Figures are based on air groups estimated as ready for combat The Japanese flew in reinforcements from Palau, the Philippines, and the Empire and brought up all three carrier divisions from the Philippines area. The best evidence indicates that they employed more than 900 aircraft in defense of the Marianas. According to postwar information, 1,500 trained Japanese naval pilots were lost during the campaign, a blow from which the Japanese naval air force did not recover.

TABLE I (Continued)

Philippine Strikes, 9-24 September 1944*

	VF	VB	VBL	VBM	VP	VSO	Total
Aircraft in the area**	390	75	54	150	16	95	780
Reinforcements***							
N.E.I	130	0	30	20	4	63	247
Formosa-Nansei Shoto	145	96	40	66	18	35	400
Carolines	67	20	-	15	3	18	123
Total	732	191	124	251	41	211	1550

* No effort is made to cover the entire Philippines campaign which was complex and into which the Japanese fed considerable numbers of aircraft. The USSBS estimated Japanese aircraft losses for the campaign to all causes at 5,000 combat, and 5,000 operational. This is the first campaign in which fast carrier forces encountered Japense Army aircraft in significant numbers.

** This figure is high. The USSBS, Campaigns of the Pacific War, p. 319, shows fluctuations, based on postwar information, of Japanese air strength in the Philippines from 1 August 1944 to the end of air action in February 1945. On 9 September 1944, there was slightly under 500 aircraft available, some 300 of which were destroyed in 5 carrier strikes between 9 and 14 September. The Japanese built their strength up to over 300 only to lose another 200 aircraft by renewed carrier attacks between 21 and 24 September. In expectation of an invasion attempt, vigorous efforts were made to rebuild the air forces and by 20 October, when United States forces landed at Leyte, the Japanese had accumulated 650 aircraft in the islands. The Battle for Leyte Gulf and subsequent carrier action reduced this number to under 300 by 1 November. The Japanese continued their efforts to replace their losses in the Philippines into December 1944. Early that month they had 580 aircraft available.

*** Actually the Japanese efforts to reinforce the Philippines required aircraft from a wider area than the intelligence estimate indicated, principally from units in the Empire.

TABLE I (Continued)

Raids Against Japan, 16-25 February 1945*

	VF	VB	VBL	VBM	VP	VO	Total
Aircraft in the area**							
Tokyo Area	485	135	-	145	-	-	765
Kobe-Osaka-Nagoya	310	50	-	30	-	-	390
Kyushu	355	170	-	170	-	-	695
Total (VF, VB, VBM)	1150	355	(10)	345	(50)	(200)	1850

Reinforcements***	
Hokkaido, Kuriles, Ominato	87
Nansei, Shoto and Formosa	581
	668

* Raids were conducted against the Japanese main islands in connection with the landings on Iwo Jima.

** No breakdown is available of VBL, VP, VO types. The figures represent aircraft in combat units.

*** Reinforcements were not likely to be brought from these areas, particularly Formosa and Nansei Shoto where Japanese were already expecting attack.

TABLE I (Continued)

Preliminaries to Okinawa* 18-30 March 1945

	VF	VB	VBL	VBM	VP	VO	Total
Aircraft in the area							
Kyushu	350	260	-	350	-	50	1150
Kure-Nagoya	360	100	-	50	-	15	525
Nansei Shoto	24	12	-	12	-	30	78
Total	734	372	-	412	-	95	1613
Reinforcements							
Empire	490	300	90	50	50	185	1165
Formosa	110	36	10	60	10	90	316
China	200	30	50	24	6	150	460
Total	800	366	150	134	66	425	1941
Grand Total	1534	738	150	546	66	520	3554

* Figures based on units assumed ready for combat and on operational types of combat aircraft had by this time become unrealistic because the Japanese in kamikaze attacks employed pilots who had not finished flying school and training aircraft slightly modified. Their losses during the campaign from 18 March to 1 July 1945 were 3,000 in combat and 4,000 to other causes. (Japanese Air Power, p 34; Campaigns of the Pacific War, p. 331, estimates Japanese losses at 7,830.)

TABLE I (Continued)

Assault on Japan, 10 July-15 August 1945

Shortage of fuel and plans to use large numbers of aircraft in suicide efforts made any estimate of air strength relatively meaningless. Conventional attack and defense were not employed, and the commitment of aircraft would be made at the time and place deemed most suitable by the Japanese Command for the defense of the home islands. Intelligence estimates furnished Task Force 38 on the areas in which it was expected to operate gave the following:

	VF	VB	VBM	VP	VO	Total	Suicide Trainer	Total
Tokyo Area	665	170	185	5	105	1130	475	1605
Hammatsu, Tenryu	-	-	70	-	10	80	8	88
Hokkaido, Ominato, Kuriles	68	25	23	-	94	210	-	210
Total	733	195	278	5	209	1420	483	1903

The fast carrier task forces, however, made strikes against other areas, particularly in Central and Southern Honshu. Photographic reconnaissance of 180 of 193 airfields showed the following:

Single engine	2,725
Twin engine	794
Single engine trainers	527
Float planes	61
Total	4,107

WSEG STAFF STUDY NO. 4

ENCLOSURE B

SUMMARY OF BATTLE DAMAGE TO U. S. CARRIERS

ENCLOSURE B

SUMMARY OF BATTLE DAMAGE TO U. S. CARRIERS - WW II - INCLUDING CAUSE AND EFFECT OF DAMAGE

	Ship	Date Hit	Cause of Damage	Continued in Operation	Temporarily Out of Action (See Remarks)	Out of Action	Required Overhaul or Repair	Duration of Overhaul or Repair	Sunk	Remarks
	Lexington	5/8/42	(2 Bombs (2 or 3 Air Torps.	X		X		Sunk	X	Hit at 1120-1121. Landed 13 planes at 1145. Launched planes at 1243. Large explosion at 1442. Fires out of control at 1450. Ship abandoned and sunk by our own DD Torpedoes.
	Yorktown	6/4-7/42	(3 Bombs; 2 Air (Torps; 2 Sub.Torps.	X		X		Sunk	X	Hit at 1430. Launched 8 VF @ 1600. Torps hit @ 1620-ship stopped-later sunk (on 7th)
	Wasp	9/15/42	2 or 3 Sub. Torps			X		Sunk	X	Finally sunk by own DD Torps. Jap sub. torps struck in way of magazines and exploded part own ammo. Fires and damage appeared manageable until 3 gas. vapor explosions occurred below deck.
	Hornet	10/26/42	(5 Bombs; 3 Air (Torps.; 2 K			X		Sunk	X	Day long action. Finally sunk by own DD Torps and gunfires after ship abandoned.
	Saratoga	1/11/42	1 Sub. Torp.	X			X	See Remarks		Repaired @ NYPH and then proceeded to NYPS for installation of blisters as previously scheduled - Duration of overhaul 4 mos., not all chargeable to torp. damage.
	Enterprise	2/1/42	1 Bomb	X				-		Splinter damage only.
	Yorktown	5/8/42	3 Bombs	X				-		Hit @ 1127. Landed planes @ 1155; launched @ 1215; launched planes @ 1230. Not sent in for overhaul or repairs.
	Enterprise	8/24/42	4 Bombs	X		X	X	3 wks		Hit @ 1712 - continued to operate planes until 1843 when steering lost. To NYPH.
	Saratoga	8/31/42	1 Sub. Torp.		X		X	7 wks		Hit @ 1948. Stopped @ 1953 as result electrical fires. At 0130 back in commission and @ 0130 landed 20 VSB and 9 VTB, @ 0030 launched & landed A/C.
	Enterprise	10/26/42	2 Bombs		X		X	2 wks		Hit @ 1115, started operating planes again @ 1230. To Noumea for repairs.
CVL	Independence	11/20/43	1 Air Torp.			X	X	24 wks		Three shafts knocked out and extensive flooding.
	Lexington	12/4/43	1 Air Torp.			X	X	8 wks		Hit @ 2330, no air operations in progress to PSNY.
						X		Sunk	X	Hangar deck fires. Finally sunk by own forces.

											torp. damage.
	Enterprise	2/1/42	1 Bomb	X				-			Splinter damage only.
	Yorktown	5/8/42	3 Bombs	X				-			Hit @ 1127. Landed planes @ 1155; launched @ 1215; launched planes @ 1230. Not sent in for overhaul or repairs.
	Enterprise	8/24/42	4 Bombs	X			X	X	3 wks		Hit @ 1712 - continued to operate planes until 1843 when steering lost. To NYPH.
	Saratoga	8/31/42	1 Sub. Torp.		X			X	7 wks		Hit @ 1948. Stopped @ 1953 as result electrical fires. At 0130 back in commission and @ 0130 landed 20 VSB and 9 VTB, @ 0030 launched & landed A/C.
	Enterprise	10/26/42	2 Bombs		X			X	2 wks		Hit @ 1115, started operating planes again @ 1230. To Noumea for repairs.
CVL	Independence	11/20/43	1 Air Torp.				X	X	24 wks		Three shafts knocked out and extensive flooding.
	Lexington	12/4/43	1 Air Torp.				X	X	8 wks		Hit @ 2330, no air operations in progress to PSNY.
CVL	Princeton	10/24/44	1 Bomb				X		Sunk	X	Hangar deck fires. Finally sunk by own forces.
	Intrepid	2/17/44	1 Air Torp.				X	X	6 days		Steering gear damaged.
	Wasp	2/19/44	5 Bombs	X					-		Fragment damage, local fires.
	Bunker Hill	6/19/44	1 Bomb	X					-		Fragment damage, local fires, minor flooding.
	Franklin	10/13/44	1 K	X					-		Negligible damage.
	Hancock	10/14/44	1 Bomb	X					-		Minor fragment damage.
	Franklin	10/15/44	3 Bombs	X					-		Minor fragment damage. Small fires. Minor damage.
	Intrepid	10/29/44	1 K	X					-		Small fire - quickly extinguished.
	Franklin	10/30/44	1 K		X			X	10 wks		Hit @ 1046. Recovered planes of strikes in air @ 1337. Launched again @ 1649. Recovered @ 1758. To PSNY. Extensive fires were extinguished in 2½ hours.
	Lexington	11/5/44	1 K	X							Small fires extinguished in 20 minutes.
	Essex	11/25/44	1 K	X							Minor fires, minor flight deck damage. Hit @ 1256, resumed flight operations @ 1326 (30 min.)
	Intrepid	11/25/44	2 K				X	X	7 wks		Extensive fires & structural damage. Hit @ 1254/59. Flight deck fires out @ 1314; others under control @ 1532. To NYSF.
CVL	Belleau Wood	10/30/44	1 K				X	X	4½ wks		Serious fires on flight deck, gallery and 01 decks. To NYSF.
CVL	Cabot	11/25/44	2K		X				2 wks		Small fires. Minor structural damage. Severe fragment damage. To Ulithi for repairs - Operated planes 1 hr. 06 min. after hit.
	Ticonteroga	1/21/45	2 K				X	X	9 wks		Extensive fires and damage to electrical cables under flight deck forward. To NYPS.
	Saratoga	2/21/45	(4 ? (2 Bombs					X	10 wks		Hits over period from 1700 to 1846. Extensive fires and severe structural damage. By 2015 ready to land A/C. To PSNY.
	Randolph	3/11/45	1 K					X	3 days		Ship at anchor Ulithi when hit. Repaired @ Ulithi.
	Enterprise	3/18/45	1 Bomb	X				X	12 days		Minor fires, minor damage. No interruption of operations--(Bomb broke up). Repaired @ Ulithi.
	Intrepid	3/18/45	1 K	X				X	11 days		Minor gasoline fires, minor fragment damage. Repaired @ Ulithi.

	Intrepid	3/18/45	1 K	X			X	11 days		Minor gasoline fires, minor fragment damage. Repaired@ Ulithi.
	Yorktown	3/18/45	1 Bomb	X						Severe blast and fragment damage to exterior shell plating. Minor fires quickly extinguished. No interruption of operations.
	Franklin	3/19/45	2 Bombs			X	X	End of war		Terrific conflagrations and explosions of own bombs, ammo., and Tiny Tims.
	Wasp	3/19/45	1 Bomb		X		X	7 wks		Severe fires. Moderate structural damage. Resumed routine flight operations day after hit. Withdrawn following day and ordered NY.
	Hancock	4/7/45	1 K		X		X	7 wks		Severe fires. Hit@ 1210, landed returning strike@ 1630. Withdrawn and ordered Pearl Harbor for repair.
	Enterprise	4/11/45	2 K		X		X	4 wks		Minor fires, hull damage and flooding. Heavy shock damage to machinery. Hits @ 1410 and 1510. Launched planes@ 1552.
	Essex	4/11/45	1 Bomb	X				-		Minor damage. Hit 1507. Launched@ 1541, landed CAP@ 1604.
	Intrepid	4/16/45	1 K		X		X	5 wks		Severe conflagration, moderate blast and fragment damage. Hit@ 1336, fires out@ 1544 and reported ready to land planes. Repair@ Hunter's Point.
	Bunker Hill	5/11/45	2 K			X	X	16 wks		Severe fires, moderate structural damage. Out of action. To NYPS.
	Enterprise	5/11/45	1 K			X	X	14 wks		Fires controlled in 30 min., but bulging of flight deck required sending planes to other ships. To PSNY.
CVL	Langley	1/21/45	1 Bomb		X		X	9 days		Moderate blast and fragment damage. Minor fires. Hit@ 1207, recovered planes @ 1435 and fleet operations continued thereafter.
CVL	San Jacinto	4/6/45	1 K	X				-		Minor damage.

WSEG STAFF STUDY NO. 4

ENCLOSURE C

RESOURCES, ASSIGNMENT, AND USE OF U.S. CARRIERS

The Purpose is to show the carriers available to the U.S. Navy in World War II and their assignments by primary mission.

Prepared by

AVIATION HISTORY SECTION, DCNO(AIR)

August 1950

DEFINITIONS

General: (a) Change of activity effected on any calendar day is credited to the new activity.

(b) A carrier engaged in more than one type of activity simultaneously is posted under its major activity.

In Commission: Total days in commission beginning with commissioning date and extending through date of decommissioning, sinking, or 15 August 1945 whichever is earlier.

Carrier Task Force or Assault: Carriers assigned to task forces and ready for combat operations.

(a) At Sea on Operational Mission: Within Carrier Task Force or Assault employment, the number of days at sea with an operating air group on board from time of sortie to end of period or return to replenishment point.

(b) Engaged with the Enemy: The number of days at sea when the carrier was in actual contact with the enemy in offensive or defensive air action.

Anti-Submarine Warfare: Assigned to anti-submarine operations as a primary mission as in JASASA and hunter-killer groups.

Transport: Refers mainly to transport of Army, Navy, or Marine aircraft, but also includes transport of personnel and equipment.

Pilot Training: Ships assigned to training of air groups as opposed to ship's crew training, anti-aircraft training, shakedown, etc. Does not include ships engaged in exercising own air group.

Repair and Overhaul: - Includes both time enroute and in the Yard from date of detachment from combat force (or area) to date of departure from Yard on shakedown, new assignment, or return to old assignment.

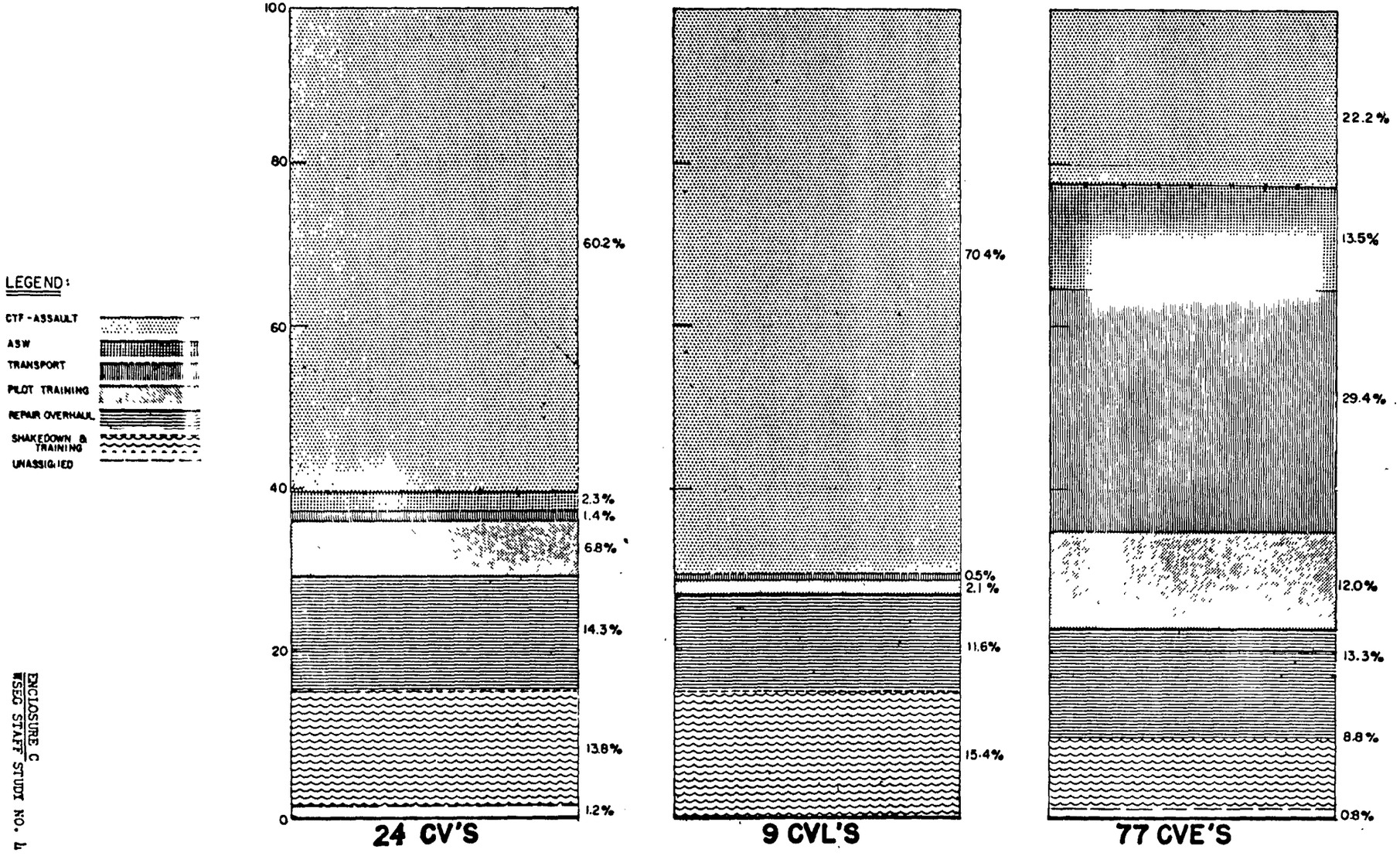
Shakedown and Training: Period of preparation of vessel and crew for active duty beginning with commissioning date and extending to date of departure from port or assignment to operational duty. It may also follow a period of major repair in which case it begins with completion of overhaul (departure from Yard) and extends to assignment to operational duty.

Unassigned: Employment not clearly indicated in available records.

SOURCES

Compiled from information on file in the Aviation History Section of DCNO(Air) summarizing official carrier war diaries, histories, and action reports.

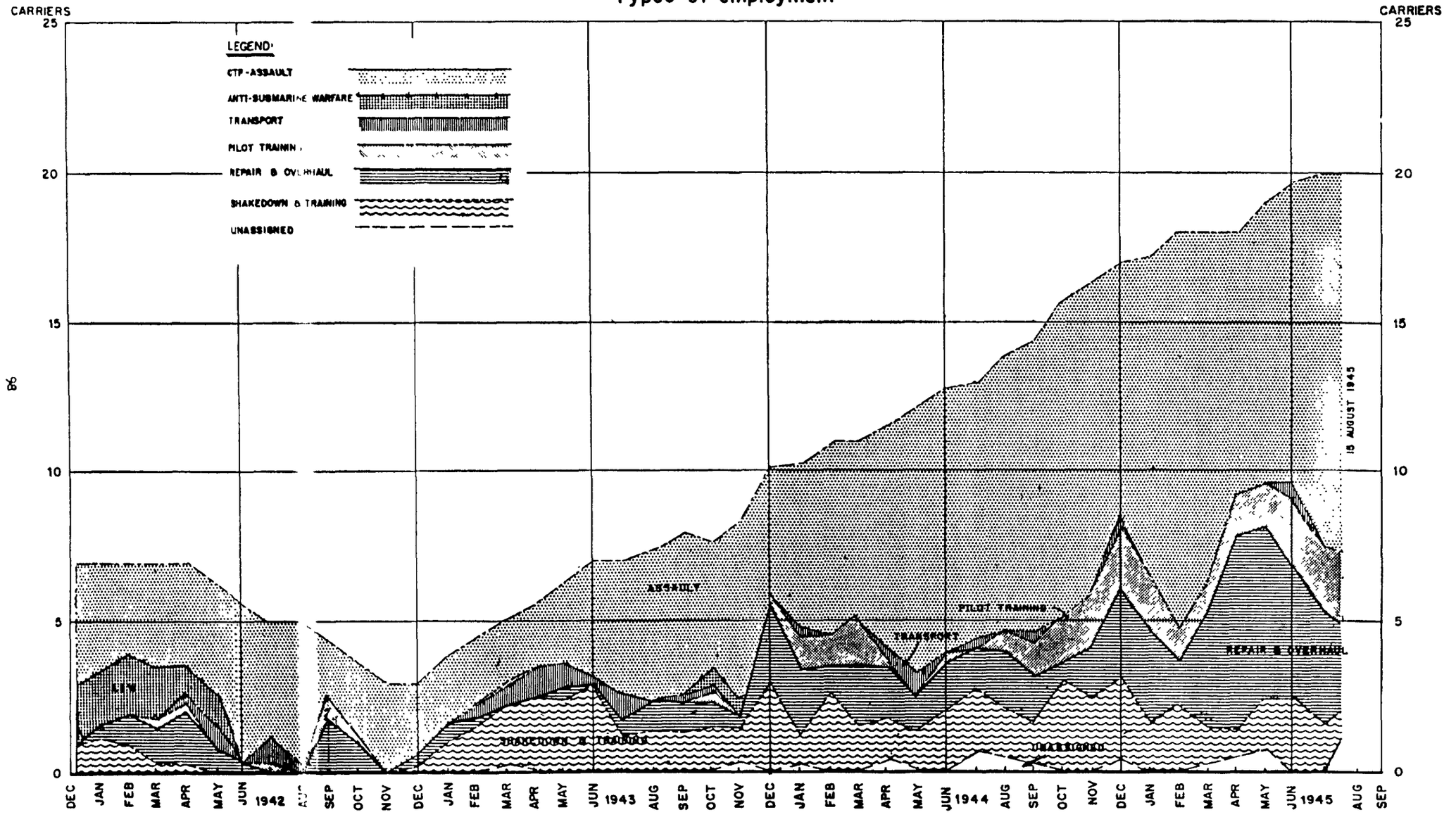
CARRIER EMPLOYMENT, WORLD WAR II



ENCLOSURE C
WSEG STAFF STUDY NO. 4

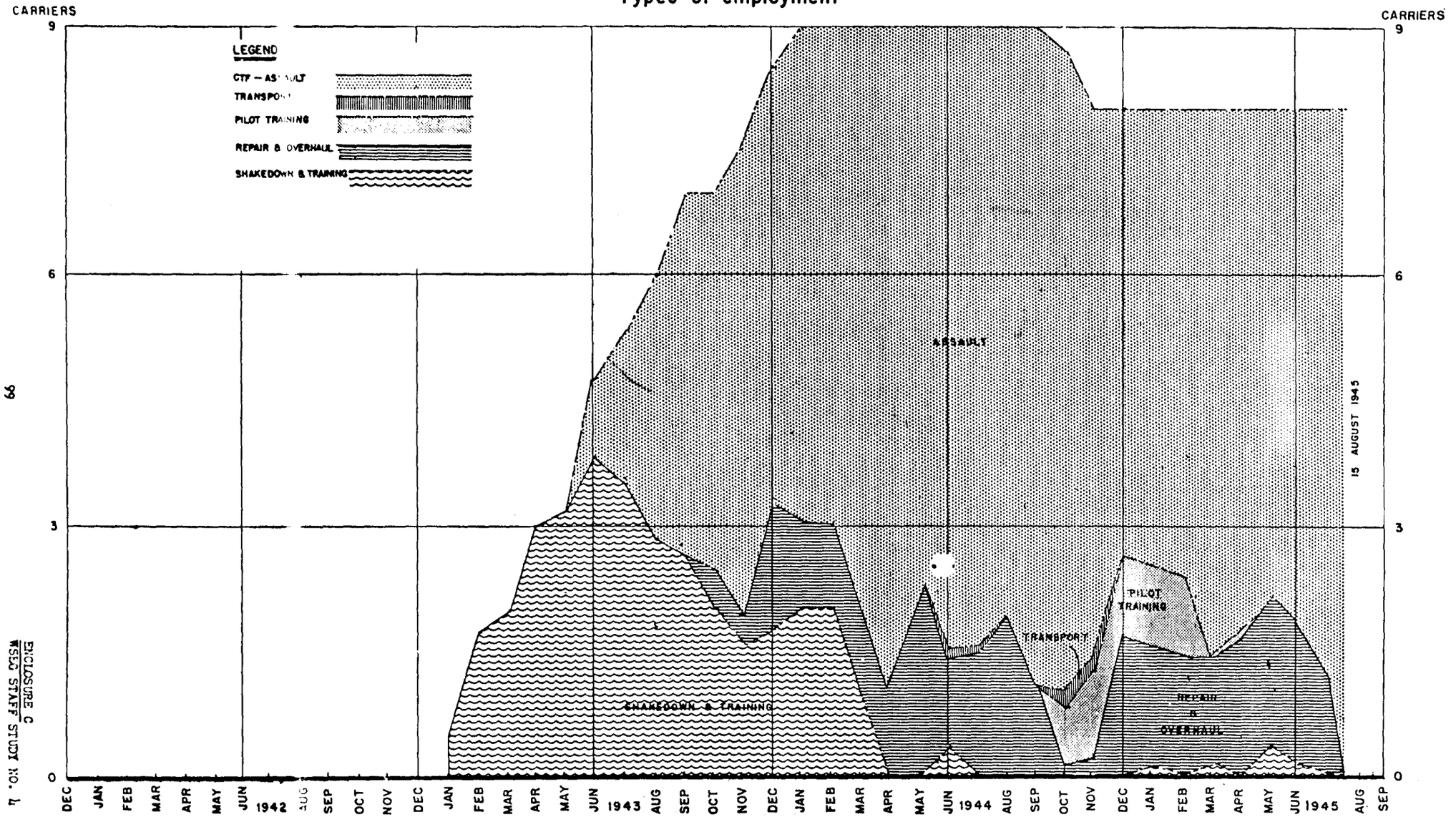
CV's IN COMMISSION, WORLD WAR II

Types of employment



CVL's IN COMMISSION, WORLD WAR II

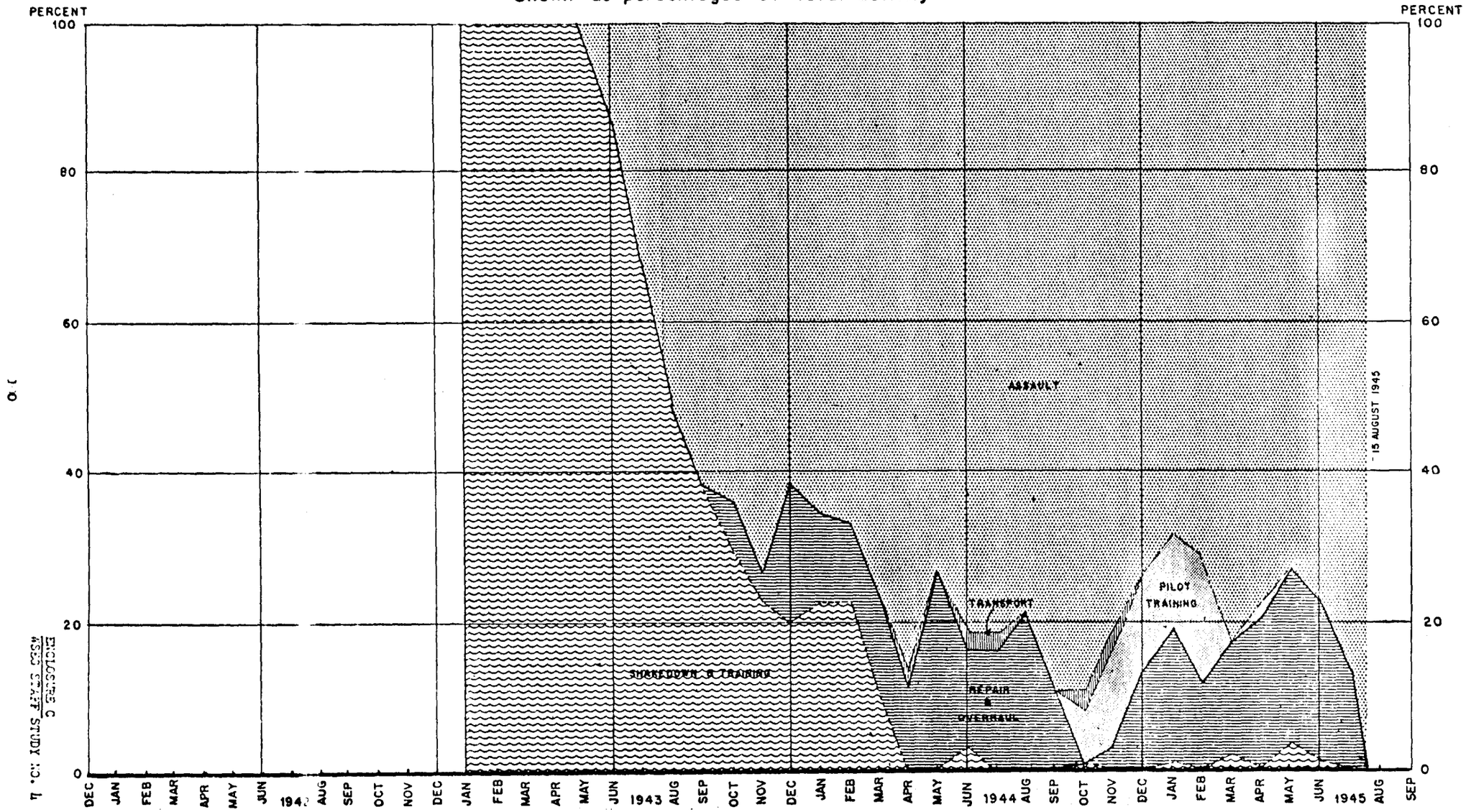
Types of employment



ENCLOSURE C
MSG STAFF STUDY NO. 4

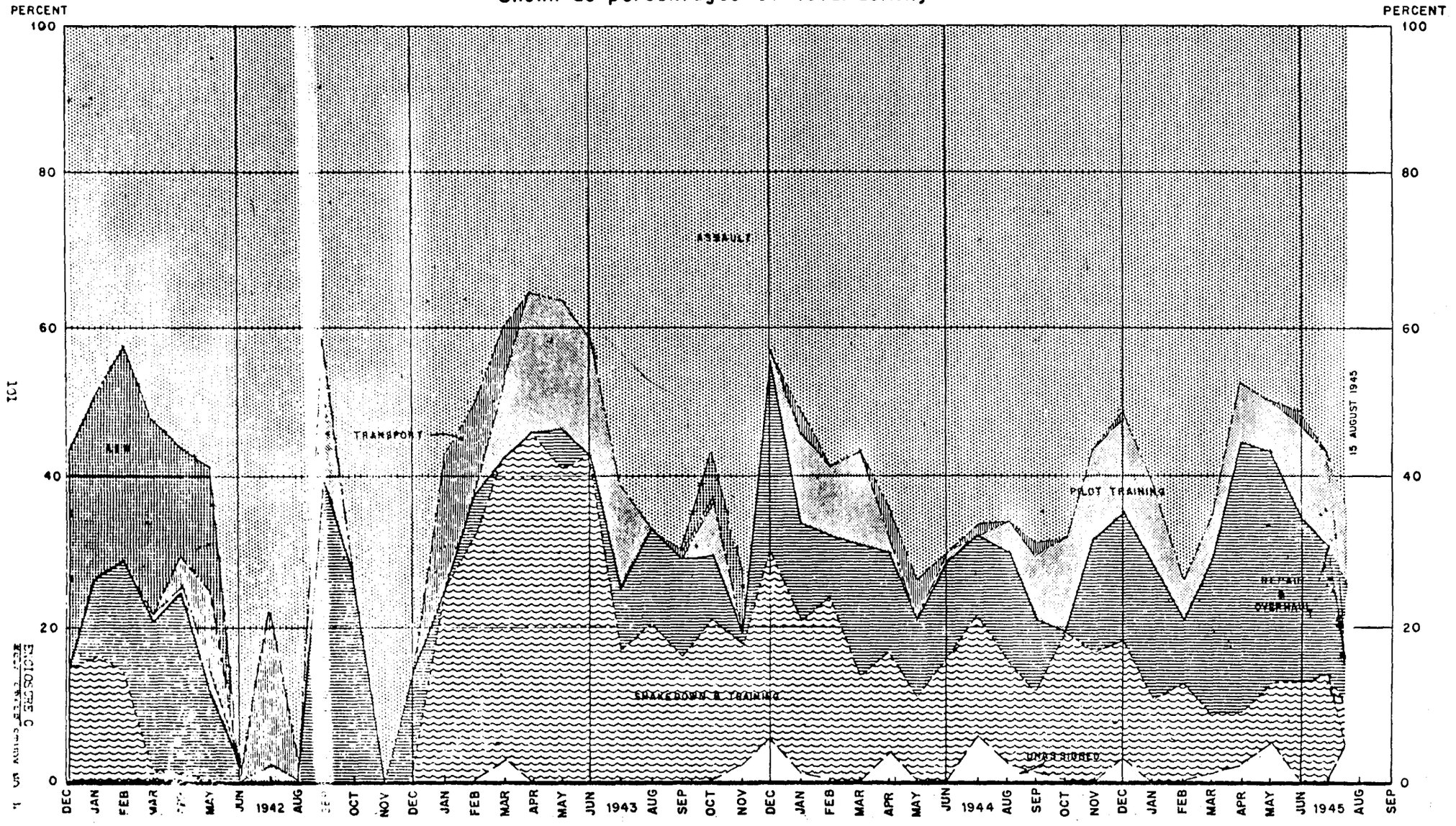
CVL EMPLOYMENT, WORLD WAR II

Shown as percentages of total activity



CV EMPLOYMENT, WORLD WAR II

Shown as percentages of total activity



CARRIER UTILIZATION, TYPE CV

Carrier Days per Month by Employment

TYPE OF EMPLOYMENT	1941 Dec	1942 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
In Commission	175	217	196	217	210	194	157	155	155	135	119	90	94
Carrier Task Force or Assault	100	108	84	114	119	115	155	121	151	57	82	90	81
At Sea on Operational Mission	82	91	65	81	84	96	98	71	112	41	50	37	22
Engaged with the Enemy	1	3	4	6	1	10	11	0	14	1	5	6	0
Anti-Submarine Warfare	50	52	56	57	30	31							
Transport					9	27	0	31	4				
Pilot Training				1	1			3		25	5		
Repair and Overhau		22	28	42	50	21	2			53	32		12
Shakedown and Training	25	35	28	3	1								12
Unassigned													

TYPE OF EMPLOYMENT	1943 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
In Commission	124	124	155	166	293	210	217	233	240	243	249	310
Carrier Task Force or Assault	71	62	62	60	71	88	132	155	168	139	180	137
At Sea on Operational Mission	19	34	6	21	36	13	63	65	107	78	150	73
Engaged with the Enemy	5						1	2	1	7	37	6
Anti-Submarine Warfare										14	22	
Transport	22	16	5						3	2		
Pilot Training			22	30	33	33	31			16		3
Repair and Overhau		6			11		18	31	30	21	3	75
Shakedown and Training	31	40	62	76	78	89	36	47	39	51	39	64
Unassigned			4								5	31

CARRIER UTILIZATION, TYPE CV

Carrier Days per Month by Employment

TYPE OF EMPLOYMENT	1944 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
In Commission	311	319	341	346	372	383	403	429	436	488	485	527
Carrier Task Force or Assault	162	188	193	225	275	268	268	282	300	333	277	273
At Sea On Operational Mission	104	129	129	138	109	200	200	129	245	283	198	163
Engaged with the Enemy	16	38	19	33	7	86	110	19	59	88	44	32
Anti-Submarine Warfare												
Transport	7			11	19		7		7			4
Pilot Training	36	29	42	7		4		23	37	62	54	62
Repair and Overhaul	41	25	61	45	36	50	41	59	42		74	93
Shakedown and Training	63	77	45	46	42	61	64	57	47	93	80	82
Unassigned	2			12			23	8	3			13

TYPE OF EMPLOYMENT	1945 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
In Commission	531	504	558	540	589	598	620	300	13,658
Carrier Task Force or Assault	325	373	366	261	292	310	355	192	8,220
At Sea on Operational Mission	271	290	266	239	224	153	314	169	5,548
Engaged with the Enemy	82	73	93	143	90	37	51	28	1,269
Anti-Submarine Warfare									312
Transport						12			186
Pilot Training	58	28	31	41	43	69	73	33	935
Repair and Overhaul	93	41	112	190	181	132	139	45	1,957
Shakedown and Training	55	62	45	37	46	75	53	15	1,890
Unassigned			4	11	27			15	158

ENCLOSURE C
CAG STAFF STUDY NO. 1

CARRIER UTILIZATION, TYPE CVL

Carrier Days per Month by Employment

TYPE OF EMPLOYMENT	1941 Dec	1942 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
In Commission													
Carrier Task Force or Assault													
At Sea on Operational Mission													
Engaged with the Enemy													
Anti-Submarine Warfare													
Transport													
Pilot Training													
Repair and Overhaul													
Shakedown and Training													
Unassigned													

TYPE OF EMPLOYMENT	1943 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
In Commission	18	33	62	90	97	134	163	187	210	217	224	265
Carrier Task Force or Assault						20	53	96	131	141	166	164
At Sea on Operational Mission						17	30	47	88	73	130	86
Engaged with the Enemy								1	17	6	36	7
Anti-Submarine Warfare												
Transport												
Repair and Overhaul										14	9	48
Shakedown and Training	18	33	62	90	97	114	110	91	79	62	49	53
Unassigned												

CARRIER UTILIZATION, TYPE CVL

Carrier Days per Month by Employment

TYPE OF EMPLOYMENT	1944 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
In Commission	279	261	279	270	279	270	279	279	270	272	240	248
Carrier Task Force or Assault	183	174	215	235	207	223	230	220	240	241	196	184
At Sea on Operational Mission	111	122	130	173	72	185	165	96	217	216	146	96
Engaged with the Enemy	16	55	22	50	3	104	77	22	48	53	38	17
Anti-Submarine Warfare												
Transport				5		6	6			11	7	
Pilot Training										19	30	31
Repair and Overhaul	34	29	35	30	72	31	43	59	30		7	33
Shakedown and Training	62	58	29			10				1		
Unassigned												

TYPE OF EMPLOYMENT	1945 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total
In Commission	248	224	248	240	248	240	248	120	6,742
Carrier Task Force or Assault	170	160	206	187	182	186	215	119	4,744
At Sea on Operational Mission	137	111	149	172	149	64	195	100	3,277
Engaged with the Enemy	54	32	51	64	40	26	36	17	892
Anti-Submarine Warfare									
Transport									35
Pilot Training	31	27		4				1	143
Repair and Overhaul	45	37	37	49	57	53	33		785
Shakedown and Training	2		5		9	1			1,035
Unassigned									

WSEG STAFF STUDY NO. 4

ENCLOSURE D

AVAILABILITY AND EMPLOYMENT OF CARRIER TYPE AIRCRAFT

The Purpose is to show the number of carrier type aircraft available to the U. S. Navy in World War II, their assignment to aviation activities, the extent of their operational use, and losses resulting from use.

Prepared by

AVIATION HISTORY SECTION, DCNO(AIR)

September 1950

Part I-B Availability and Employment of Carrier Type Aircraft

Carrier type aircraft are considered in two basic types: fighters (VF) and bombers (VB/T) of the following model designations:

VF	-	F2A, F3A, F4F, FM, F6F, F4U, FG
VB/T	-	SBD, SBF, SBC, SB2U, SBW, SB2C, TBD, TBF, TBM

Tabulations include only service and obsolescent models; experimental types are omitted.

Information has been compiled in four main categories:

Assignment - indicating the total number of aircraft on hand monthly and their assignment to (1) carrier squadrons aboard and ashore, (2) other squadrons and shore activities, and (3) logistic support.

Losses - outside the continental limits only, for carrier and land operations by month according to (1) type of flight, (2) general cause, and (3) operational accidents by type of flight.

Sorties - action and non-action, by month for 1944-45 only, for carrier and shore-based squadrons in action during the month.

Flight Hours - quarterly totals for squadrons operating, or intended for operation, from carriers.

The above limits for each category, particularly for those concerning use, emphasize the fact that relationships implied in the titles are not as real as they first appear. Because such common factors as specific employment and area of operation are not available in existing compilations of original squadron reports, it is impossible to set up tabulations which are in direct ratio to each other.

ASSIGNMENT

Shown in three major groupings each of which is broken down into significant subdivisions. The following define the scope of the items tabulated.

General

Changes in the aircraft reporting system make it impossible to tabulate some items with continuity through the entire war. Information which was easily obtainable for one period was either not available or entirely different in character in another period. This is particularly evident in the months before and after September 1944. On this date a sharp division occurs which centers on the following two categories:

In Logistic Support - Available sources show, prior to September 1944, the number of aircraft in support but show the same aircraft assigned to other activities. The figures tabulated under this heading for the same period are therefore of the "non-adding" type. After September 1944, the number in support is separable.

In Carrier Squadrons - The numbers shown in the tabulation are based on assignments to specific squadrons, information for which was available in the basic source prior to September 1944. Because such information was lacking in the same source after that date, it was necessary to refer to another report to determine aircraft aboard, ashore, and assigned to the Marine Corps. The use of two sources for different parts of the same monthly distribution accounts for the difference between the totals of the several parts and the figure showing the total on hand.

On Hand - The total number available.

On Board Operational Carriers - includes all carriers not in repair and overhaul or on transport duty. Marine Corps squadrons are included after December 1944 when they were first assigned to carrier operations.

In Carrier Squadrons Ashore - spare air groups, replacement squadrons, those in training while awaiting assignment, and in combat from shore bases.

In Other Aviation Activities - inshore patrol squadrons, naval air stations, commands, service units, and others not intended for carrier operations. Aircraft assigned to the Marine Corps (except carrier squadrons) and to the Training Command or its predecessors are listed separately under this group. After September 1944 the totals include a number of unreported aircraft.

In Logistic Support - pools, under repair and overhaul, and in process of delivery. For the period January 1942-September 1944, the number shown in support is duplicated in other assignments.

SOURCES

Two main sources were used, both of which are based on reports submitted by aviation activities and squadrons.

Monthly Status of Naval Aircraft - issued through June 1943 by the Bureau of Aeronautics and after by the Office of the Chief of Naval Operations. Being based on squadron and

activity reports which were not of identical dates, these reports do not show the exact status of aircraft on any specific day of the month.

The form and content of the report changed four times during the war. During the first years (1942-44), aircraft listed in repair and overhaul are included among those listed in other categories. Some inconsistencies exist between listings in the recapitulation and those showing assignments to the Fleet. Beginning with September 1944, assignments to squadrons are not shown.

Geographical Location of U. S. Naval Aircraft - a weekly report compiled by Op-31R, subject to the same inconsistencies noted in the monthly status reports. This source was used to determine aircraft assigned to squadrons for the period from September 1944 to the end of the war.

ASSIGNMENT OF CARRIER TYPE COMBAT AIRCRAFT
1942

	January		February		March		April		May		June	
	VF	VB/T	VF	VB/T	VF	VB/T	VF	VB/T	VF	VB/T	VF	VB/T
Total On Hand	537	776	596	757	629	784	710	849	793	927	831	888
On Board Operational Carriers	120	321	107	312	85	239	211	284	244	289	168	258
In CTF or Assault	58	250	53	241	17	157	162	251	116	258	147	258
ASW	62	71	54	71	62	82	43	33	28	31		
Shakedown & Training					6		6				21	
Other												
In Carrier Squadrons Ashore	46		50	1	87	46	70	53	104	46	104	12
In Other Aviation Activities	371	455	439	444	457	499	429	512	545	592	559	618
Marine Corps	36	86	37	80	75	68	109	57	146	121	124	104
Training Command	46	84	33	82	71	137	98	117	125	128	116	113
Other Shore Activities	289	285	369	282	311	294	222	338	274	343	319	401
In Logistic Support	247	143	260	50	205	177	231	173	238	243	299	305
Repair and Overhaul	144	146	136	40	85	117	88	83	57	76	72	113
Pools	38		45	1	64	18	51	11	74	76	105	67
In Delivery	65	2	27	9	56	42	92	79	107	96	122	125

	July		August		September		October		November		December	
Total On Hand	781	875	813	989	870	1,100	1,015	1,271	1,064	1,421	1,253	1,575
On Board Operational Carriers	125	261	186	257	163	124	146	224	137	166	197	182
In CTF or Assault	113	261	129	255	90	72	86	160	77	123	87	94
ASW							11	17	9	14	29	33
Shakedown & Training	6		56	2	73	52	42	31	11	6	81	55
Other	6						7	16	40	23		
In Carrier Squadrons Ashore	207	35	188	120	147	277	185	206	110	182	107	192
In Other Aviation Activities	449	579	440	612	560	699	684	841	817	1,073	949	1,201
Marine Corps	128	113	176	118	208	188	211	210	149	186	139	191
Training Command	47	117	43	135	96	167	146	214	157	331	202	271
Other Shore Activities	274	349	221	359	256	344	327	417	511	556	608	739
In Logistic Support	249	359	229	335	278	296	387	383	539	512	604	647
Repair and Overhaul	74	114	104	108	139	108	173	138	163	132	125	167
Pools	109	116	71	87	53	73	114	122	160	162	150	141
In Delivery	66	129	54	140	86	115	100	123	216	218	329	339

ASSIGNMENT OF CARRIER TYPE COMBAT AIRCRAFT
1943

	January		February		March		April		May		June	
	VF	VB/T	VF	VB/T	VF	VB/T	VF	VB/T	VF	VB/T	VF	VB/T
Total on Hand	1,298	1,724	1,395	2,009	1,553	2,289	1,801	2,604	2,053	3,100	2,289	3,461
On Board Operational Carriers	249	242	193	202	178	273	234	322	175	275	311	488
In CTF or Assault	126	162	153	123	84	79	95	132	34	65	92	187
ASW	27	38	22	49	25	32	5	19	25	37	49	93
Shake down & Training	85	28		5	59	158	104	163	94	156	146	184
Other	11	14	18	25	10	4	30	8	22	17	24	24
In Carrier Squadrons Ashore	115	271	194	304	231	355	373	491	293	338	379	589
In Other Aviation Activities	934	1,211	1,008	1,503	1,144	1,661	1,194	1,791	1,585	2,487	1,599	2,384
Marine Corps	232	261	220	258	281	176	300	333	298	265	218	353
Training Command	231	279	207	319	229	421	229	454	252	482	241	402
Other Shore Activities	471	671	581	926	634	1,064	665	1,004	1,035	1,740	1,140	1,629
In Logistic Support	477	606	536	819	356	605	564	722	738	1,150	844	1,193
Repair and Overhaul	110	152	145	107	147	188	130	155	162	209	163	128
Pools	146	173	177	381	12	55	201	228	380	538	466	691
In Delivery	221	281	214	331	197	362	233	339	196	403	215	374

	July		August		September		October		November		December	
Total on Hand	2,604	3,863	3,000	4,274	3,542	4,811	3,966	5,241	4,678	5,726	5,516	6,185
On Board Operational Carriers	416	525	416	491	366	515	587	691	589	667	435	454
In CTF or Assault	197	261	191	270	273	395	347	382	435	468	205	247
ASW	71	100	67	84	35	52	76	105	62	90	38	48
Shakedown and Training	88	152	123	82	58	68	102	131	70	75	134	124
Other	60	12	35	55			62	73	22	34	58	35
In Carrier Squadrons Ashore	442	615	527	578	647	782	711	856	711	808	803	735
In Other Aviation Activities	1,746	2,723	2,055	3,205	2,529	3,514	2,668	3,694	3,378	4,251	4,278	3,996
Marine Corps	374	390	466	488	432	491	874	784	770	756	731	637
Training Command	263	629	307	631	331	690	451	726	578	824	624	922
Other Shore Activities	1,109	1,704	1,282	2,086	1,766	2,333	1,343	2,184	2,030	2,671	2,923	2,437
In Logistic Support	939	1,219	1,112	1,349	1,442	1,688	1,269	1,654	1,275	1,729	2,405	1,924
Repair and Overhaul	120	133	134	123	173	137	163	117				
Pools	545	677	558	684	613	720	444	729	536	985	1,092	934
In Delivery	274	409	420	542	656	831	662	808	739	744	1,313	990

ASSIGNMENT OF CARRIER TYPE COMBAT AIRCRAFT
1944

	January		February		March		April		May		June	
	VF	VB/T	VF	VB/T	VF	VB/T	VF	VB/T	VF	VB/T	VF	VB/T
Total on Hand	6,384	6,624	7,230	7,067	8,089	7,586	9,028	8,053	9,641	8,402	10,348	8,734
On Board Operational Carriers	758	802	869	829	885	782	886	834	1,099	1,001	1,138	951
In CTF or Assault	466	467	522	475	570	522	593	532	870	773	711	635
ASW	33	45	37	45	73	75	144	122	64	80	75	77
Shakedown and Training	194	211	221	212	161	125	93	130	130	122	196	186
Other	65	79	89	97	81	60	56	50	35	26	156	53
In Carrier Squadrons Ashore	681	839	970	1,126	825	903	1,279	1,026	1,212	971	1,210	1,074
In Other Aviation Activities	4,945	4,871	5,391	5,122	6,357	5,883	6,863	6,193	7,330	6,430	8,000	6,709
Marine Corps	538	708	968	727	789	556	1,025	658	1,170	774	1,271	803
Training Command	769	984	791	836	905	901	1,142	896	1,358	1,047	1,445	964
Other Shore Activities	3,638	3,179	3,632	3,559	4,663	4,426	4,696	4,639	4,802	4,609	5,284	4,942
In Logistic Support	1,919	1,319	2,636	2,088	2,883	2,427	3,798	2,570	1,977	1,976	2,602	1,982
Repair and Overhaul	338	159	532	520	773	715	1,104	775	1,134	1,043	1,505	994
Pools	312	354	701	505	1,121	716	1,707	817				
In Delivery	1,269	806	1,403	1,063	989	996	987	978	843	933	1,097	988

	July		August	September		October		November		December	
Total On Hand	10,763	8,993		10,929	8,876	11,383	9,167	11,442	9,367	11,800	9,240
On Board Operational Carriers	1,064	1,016		977	892	1,244	912	1,059	743	1,233	806
In CTF or Assault	696	622		841	753	1,023	718	733	499	888	499
ASW	88	156		114	112	132	129	176	127	134	115
Shakedown and Training	157	155	N O T			39	54	103	84	131	122
Other	123	83		22	27	50	11	47	33	80	70
			A V A I L A B L E								
In Carrier Squadrons Ashore	1,259	1,133		1,844	1,349	1,466	1,118	1,586	1,208	1,862	1,071
In Other Aviation Activities	8,440	6,844		3,764	2,974	4,092	2,910	3,896	2,861	3,738	2,813
Marine Corps	1,302	858		1,474	1,102	1,586	983	1,699	1,059	1,402	1,037
Training Command	1,358	1,037		922	754	1,051	772	1,047	914	1,095	972
Other Shore Activities	5,780	4,949		1,368	1,118	1,455	1,155	1,150	888	1,241	804
In Logistic Support	2,331	1,763		4,340	3,236	4,372	3,362	4,713	4,134	4,746	4,068
Repair and Overhaul	1,153	892		1,341	973	1,517	940	1,993	1,445	2,014	1,623
Pools				2,320	1,695	2,068	1,732	2,063	2,068	1,560	1,682
In Delivery/Transit	1,178	871		679	568	787	690	657	621	1,172	763

ASSIGNMENT OF CARRIER TYPE COMBAT AIRCRAFT
1945

	January		February		March		April		May		June	
	VF	VB/T	VF	VB/T	VF	VB/T	VF	VB/T	VF	VB/T	VF	VB/T
Total On Hand	11,771	9,287	12,002	9,442	12,533	9,829	12,852	9,821	13,232	9,948	13,756	10,038
On Board Operational Carriers	1,457	690	1,596	712	1,292	603	1,305	703	1,120	586	1,425	645
In CTF or Assault	1,227	538	1,342	562	1,188	533	1,150	548	1,029	472	1,229	537
ASW	78	84	114	64	35	40	26	76	51	59	49	36
Shakedown and Training	69	30	68	30	69	30	108	52	35	23	85	42
Other	83	38	72	56			21	27	5	32	62	30
In Carrier Squadrons Ashore	1,883	1,089	2,079	1,199	2,207	1,520	2,259	1,345	3,090	1,719	3,009	1,539
In Other Aviation Activities	3,655	2,576	3,141	2,420	3,489	2,389	3,309	2,283	3,171	2,106	2,983	2,150
Marine Corps	1,413	1,003	1,160	915	1,482	836	1,133	865	1,014	779	1,211	795
Training Command	1,261	1,052	1,244	1,007	1,261	1,032	1,283	987	1,412	932	1,354	1,051
Other Shore Activities	981	521	737	498	746	521	893	431	745	395	418	304
In Logistic Support	4,371	4,105	4,995	4,348	5,528	4,389	5,170	4,279	5,115	4,458	5,644	4,656
Repair and Overhaul	1,834	1,534	2,016	1,506	2,059	1,704	2,220	1,657	2,115	1,935	2,635	2,172
Pools	1,594	1,701	1,892	2,166	2,398	2,157	1,940	2,076	2,005	2,021	1,830	1,994
In Delivery/Transit	943	870	1,087	676	1,071	528	1,010	546	995	502	1,179	490

	July		August	
Total On Hand	14,247	10,142	14,524	9,952
On Board Operational Carriers	1,426	638	1,602	743
In CTF or Assault	1,124	463	1,306	560
ASW	66	48	67	51
Shakedown and Training	200	103	69	30
Other	36	24	160	102
In Carrier Squadrons Ashore	2,775	1,459	2,955	1,491
In Other Aviation Activities	2,946	2,322	2,878	2,144
Marine Corps	1,141	761	1,074	555
Training Command	1,227	1,205	1,123	1,240
Other Shore Activities	578	356	681	349
In Logistic Support	6,252	4,763	6,407	4,546
Repair and Overhaul	3,024	1,862	3,566	1,907
Pools	2,034	2,272	2,143	2,201
In Delivery/Transit	1,194	629	698	438

LOSSES

Shown in three tables, the first two of which repeat total losses under type of flight and under general cause; the third indicates losses resulting from operational accidents. The tables show losses from ship and shore bases outside the continental limits and therefore include all losses for carrier operations but for land operations exclude those occurring in the United States.

In the original record, losses are attributed to three factors: type of flight, general cause, and immediate cause. Only the first two of these are shown in the accompanying tables. The following list of immediate causes included under enemy action on different types of flights will illustrate the variety of causes involved in each heading.

By Enemy Action:

On Combat Mission - losses to enemy aircraft, to anti-aircraft fire, in collision with aircraft, explosion of target or own bomb hits, and unknown.

On Search or Reconnaissance - by enemy aircraft and anti-aircraft fire.

On All Other Flights - by enemy aircraft and lost with ship.

Not in Flight - by enemy bombing, lost with ship, to anti-aircraft fire, fire, and unknown.

Tabulations are based on a record compiled in ONI from reports submitted by aviation activities, titled Aircraft Recommended for Striking (NavAer 333A-1S).

LOSSES OF CARRIER TYPE AIRCRAFT OUTSIDE THE CONTINENTAL LIMITS
By Type of Flight and Base

	Combat Mission				Search or Reconnaissance				All Other Flights				Not in Flight				Total			
	VF		VB/T		VF		VB/T		VF		VB/T		VF		VB/T		VF		VB/T	
	Car.	Land	Car.	Land	Car.	Land	Car.	Land	Car.	Land	Car.	Land	Car.	Land	Car.	Land	Car.	Land	Car.	Land
1941 Dec	4	3	8						6	1	1	3	8	12	1	17	18	16	10	20
1942 Jan							1			4	4	2						4	5	2
Feb	4	1	17						1	2	4	1			2		5	3	23	1
Mar			2						3	1	4						3	1	6	
Apr			3	1					4	3	8	3					4	3	11	4
May	13		21	1			1		10	4	7	3	9		28		32	4	57	4
Jun	18	15	73	19				4	9	5	1	3	4		7		31	20	81	26
Jul		1							2	5	2	7				1	2	6	2	8
Aug	30	12	17	1				1	2	10	6	17		2	1		32	24	24	19
Sep	1	23	5	8			3		5	8	1	3		1	3		6	32	12	11
Oct	24	41	19	26					8	9	3	8	6	23	11	40	38	73	33	74
Nov	20	26	15	11		1		3	5	8	7	9	3	14		3	28	49	22	26
Dec	1	5		7		1		1	8	5	7	42			1	1	9	11	8	51
1941-42 Totals	115	127	180	74		2	5	9	63	65	55	101	30	52	54	62	208	246	294	246
1943 Jan	3	13	2	12				1	3	10	3	7				2	6	23	5	22
Feb	2	11	1	17		10		4	7	10	8	6		1	1		9	32	10	27
Mar		5	1	2		13	1	2	5	11	4	17		1			5	30	6	21
Apr	1	28	2	23		7		4	4	14	7	10		2			5	51	9	37
May	9	7		9		4			2	28	13	14					11	39	13	23
Jun		40	1	13		10	1	1	6	33	8	18		1		2	6	84	10	34
Jul	1	52	3	14		7	2	5	7	19	15	15		2	1		8	80	21	34
Aug	5	29	1	5	2	8	3		15	23	13	15				1	22	60	17	21
Sep	2	33	4	10		1		1	12	11	14	17	1	4		4	15	49	18	32
Oct	20	18	14	15	2		3	1	10	14	9	17		1	2	1	32	33	28	34
Nov	53	31	35	7	5		11	3	24	27	15	21	20	3	14	4	102	61	75	35
Dec	9	23	7	10	2	1	7	1	21	28	16	24	10	2		2	42	54	30	37
1943 Totals	105	290	71	137	11	61	28	23	116	228	125	181	31	17	18	16	263	596	242	357

LOSSES OF CARRIER TYPE AIRCRAFT OUTSIDE THE CONTINENTAL LIMITS
By Type of Flight and Base

		Combat Mission				Search or Reconnaissance				All Other Flights				Not in Flight				Total			
		VF		VB/T		VF		VB/T		VF		VB/T		VF		VB/T		VF		VB/T	
		Car.	Land	Car.	Land	Car.	Land	Car.	Land	Car.	Land	Car.	Land	Car.	Land	Car.	Land	Car.	Land	Car.	Land
1944	Jan	20	57	20	25	2	2	16	5	29	48	19	22	5	6	10	3	56	113	65	55
	Feb	36	31	27	29	4		8	4	12	24	14	25	1	4	3	5	53	59	52	63
	Mar	21	16	25	12	5		17	3	20	27	14	21	2	3		5	48	46	56	41
	Apr	37	25	41	24	13	3	16	6	12	45	13	29	4	4	2	7	66	77	72	66
	May	11	15	6	17	5	2	7	4	24	40	7	24		8		9	40	65	20	54
	Jun	154	22	155	8	12		21	5	22	22	22	23	25	8	18	21	213	52	216	57
	Jul	67	28	64	14	9	4	11	7	18	38	14	33	8	3	8	24	102	73	97	78
	Aug	24	18	14	5	10	2	11	5	25	33	19	30	5	37	1	119	64	90	45	159
	Sep	83	20	68	7	9	1	16	6	21	33	19	40	6	10	19	41	119	64	122	94
	Oct	215	39	211	9	33	1	23	2	32	41	26	27	109	7	65	42	419	88	325	80
	Nov	85	33	68	4	10	1	11	5	41	52	28	34	24	12	10	24	160	98	117	67
	Dec	78	45	10	7	8	1	9	5	48	51	15	38	74	10	72	56	208	107	106	106
1944 Totals		861	349	709	161	120	17	166	57	304	454	210	346	263	112	208	356	1548	932	1293	920
1945	Jan	228	50	97	3	16	1	14	3	23	79	8	51	82	24	36	18	349	154	155	75
	Feb	153	32	53	11	21	1	15	3	41	59	16	33	61	22	26	18	276	114	110	65
	Mar	255	39	102	17	7	2	12	2	36	75	11	22	76	11	41	22	374	127	166	63
	Apr	248	45	75	11	8	8	9	6	10	61	5	35	84	24	25	82	350	138	114	134
	May	123	50	48	18	1	5	1	11	22	67	13	39	98	36	53	224	244	158	115	292
	Jun	71	71	10	10	44	13	4	8	33	65	18	28	38	22	44	219	146	161	76	265
	Jul	155	73	101	11	12	3	6	2	39	59	11	25	10	25	5	169	216	160	123	207
	Aug	61	20	26	1	5	6	2	3	16	15	5	15		10	2	198	82	51	35	217
1945 Totals		1294	380	512	82	74	29	63	38	220	480	87	248	449	174	232	950	2037	1063	894	1318
Grand Total		2375	1146	1472	454	205	109	262	127	703	1227	477	876	773	355	512	1384	4056	2837	2723	2841

LOSSES OF CARRIER TYPE AIRCRAFT OUTSIDE THE CONTINENTAL LIMITS
By General Cause of Loss

	Enemy Action				Combat Not En. Act.				Action of Own Forces: Accidental				Action of Own Forces: Intentional				Operational Accidents				Other				Total			
	VF		VB/T		VF		VB/T		VF		VB/T		VF		VB/T		VF		VB/T		VF		VB/T		VF		VB/T	
	Car	Land	Car	Land	Car	Land	Car	Land	Car	Land	Car	Land	Car	Land	Car	Land	Car	Land	Car	Land	Car	Land	Car	Land	Car	Land	Car	Land
1941 Dec	8	11	2	17					4	1	7			2			6	2	1	3					18	16	10	20
1942 Jan																		4	5	2						4	5	2
Feb	2	1	11														3	2	12	1					5	3	23	1
Mar			2														3	1	4						3	1	6	
Apr																	4	3	11	4					4	3	11	4
May	16		43				1										16	4	13	4					32	4	57	4
Jun	9	15	62	17													22	5	19	9					31	20	81	26
Jul																	2	6	2	7				1	2	6	2	8
Aug	22	9	9	1											1		10	15	14	18					32	24	24	19
Sept		18	5	1							1						6	14	7	9					6	32	12	11
Oct	19	56	16	53										1			19	16	17	21					38	73	33	74
Nov	11	31	6	10						1			2			2	14	17	16	14	1				28	49	22	26
Dec		4		7													9	7	7	44			1		9	11	8	51
1941-42 Totals	87	145	156	106		1			4	2	7	1	2	3	1	2	114	96	128	136	1		1	1	208	246	294	246
1943 Jan		7		6													6	16	5	15				1	6	23	5	22
Feb	2	8	1	17													7	23	8	10		1	1		9	32	10	27
Mar		3										11					5	26	6	20		1			5	30	6	21
Apr		19		13						3		1					5	29	9	22				1	5	51	9	37
May		5		4													11	34	13	19					11	39	13	23
Jun		28	1	6													6	55	9	28		1			6	84	10	34
Jul	1	34		10							1						7	45	20	24		1			8	80	21	34
Aug	5	13	2	2						5		1					17	42	15	18					22	60	17	21
Sep	2	23	3	8			1			2		2					13	23	15	21		1			15	49	18	32
Oct	10	11	4	5													22	22	23	28			1	1	32	33	28	34
Nov	37	16	30	5		1	1		6	3		3					57	41	42	25	2	1	2	1	102	61	75	35
Dec	7	16	4	4			2		2					1		2	28	37	26	29	4	1			42	54	30	37
1943 Totals	64	183	45	80		1	4		8	13	1	8		1		2	184	393	191	259	6	7	4	4	263	596	242	357

LOSSES OF CARRIER TYPE AIRCRAFT OUTSIDE THE CONTINENTAL LIMITS
By General Cause of Loss

	Enemy Action				Combat Not En. Act.				Action of Own Forces: Accidental				Action of Own Forces: Intentional				Operational Accidents				Other				Total			
	VF		VB/T		VF		VB/T		VF		VB/T		VF		VB/T		VF		VB/T		VF		VB/T		VF		VB/T	
	Car	Land	Car	Land	Car	Land	Car	Land	Car	Land	Car	Land	Car	Land	Car	Land	Car	Land	Car	Land	Car	Land	Car	Land	Car	Land	Car	Land
1944 Jan	10	36	7	19		2		2	4	2	6	1		4		1	39	67	48	30	3	2	4	2	56	113	65	55
Feb	15	19	14	19	3		3	1	1	2	2	4		3			34	32	33	38		3		1	53	59	52	63
Mar	13	12	14	12					2				1			2	31	31	42	25	1	3		2	48	46	56	41
Apr	20	14	17	14	1		2	1	2	3	1	2		1		2	42	55	51	43	1	4	1	4	66	77	72	66
May	4	9	4	14					1	2	1	1				4	35	45	14	31		9	1	4	40	65	20	54
Jun	106	9	75	7		1	2		13		2		1			2	88	36	136	29	5	6	1	19	213	52	216	57
Jul	32	14	34	6		3	5	2		1	5		3	1	1	12	62	52	50	45	5	2	2	13	102	73	97	78
Aug	20	9	9	4						20	1	53		10		44	44	46	35	35		5		23	64	90	45	159
Sep	47	7	37	6	4	3	4			1	2	1	1	9	2	38	66	44	77	48	1			1	119	64	122	94
Oct	174	15	145	2	5	4	1		7		12		13	3	20	13	209	64	138	36	11	2	9	29	419	88	325	80
Nov	50	22	45	2		2	1	1	18	1					1	10	92	72	68	43		1	2	11	160	98	117	67
Dec	27	18	3			2				1	6					21	179	80	96	61	2	6	1	24	208	107	106	106
1944 Totals	518	184	404	105	13	17	18	7	48	33	38	62	19	31	24	149	921	624	788	464	29	43	21	133	1548	932	1293	920
1945 Jan	114	14	84	2	3	1	3		5	3	1			6	1	7	226	119	64	58	1	11	2	8	349	154	155	75
Feb	114	11	46	8	1		1		5		6		1	7		7	154	89	56	48	1	7	1	2	276	114	110	65
Mar	152	15	80	8	6	2	1	1	7	1	3			7	1	18	207	101	81	34	2	1		2	374	127	166	63
Apr	140	19	60	4	2	2	3	1	15	4	1	1	1	7		78	191	103	50	47	1	3		3	350	138	114	134
May	126	22	72	6	2			1	2	4			1	11	2	191	112	105	41	62	1	16		32	244	158	115	292
Jun	25	22	5	9		4		1	8	2	4	2	1	3		194	109	118	67	53	3	12		6	146	161	76	265
Jul	90	17	65	4	1	1	2	1		5		1		9		163	125	118	56	35		10		3	216	160	123	207
Aug	33	2	8		2									6	1	198	47	39	25	19		4	1		82	51	35	217
1945 Totals	794	122	420	41	17	10	10	5	42	19	15	4	4	56	5	856	1171	792	440	356	9	64	4	56	2037	1063	894	1317
Grand Total	1463	634	1025	332	30	27	30	16	102	67	61	75	26	90	30	1009	2390	1905	1547	1215	45	114	30	194	4056	2837	2723	2843

LOSSES OF CARRIER TYPE AIRCRAFT OUTSIDE THE CONTINENTAL LIMITS
In Operational Accidents by Type of Flight

	Combat ission				Search or Reconnaissance				All Other Flights				Not in Flight				Total			
	VF		VB/T		VF		VB/T		VF		VB/T		VF		VB/T		VF		VB/T	
	Car.	Land	Car.	Land	Car.	Land.	Car.	Land	Car.	Land	Car.	Land	Car.	Land	Car.	Land	Car.	Land	Car.	Land
1941 Dec		1							6	1	1	3					6	2	1	3
1942 Jan			1							4	4	2						4	5	2
Feb	2		7						1	2	4	1			1		3	2	12	1
March									3	1	4						3	1	4	
April			3	1					4	3	8	3					4	3	11	4
May	6		5	1				1	10	4	7	3					16	4	13	4
Jun	13		18	2				4	9	5	1	3					22	5	19	9
Jul		1							2	5	2	7					2	6	2	7
Aug	8	5	8					1	2	10	6	17					10	15	14	18
Sep	1	6	3	6			3		5	8	1	3					6	14	7	9
Oct	11	7	11	13					8	9	3	8			3		19	16	17	21
Nov	9	8	9	2		1		3	5	8	7	9					14	17	16	14
Dec	1	1		1		1		1	8	5	7	42					9	7	7	44
1941-42 Totals	51	29	65	26		2	3	10	63	65	55	101			4		114	96	128	136
1943 Jan	3	6	2	6				1	3	10	3	7				1	6	16	5	15
Feb		3				10		4	7	10	8	6					7	23	8	10
Mar		2	1	2		13	1	2	5	11	4	16					5	26	6	20
Apr	1	7	2	9		7		4	4	13	7	9		2			5	29	9	22
May	9	3		5		3			2	28	13	14					11	34	13	19
Jun		12		9		10	1	1	6	33	8	18					6	55	9	28
Jul		18	3	5		7	2	4	7	19	15	15		1			7	45	20	24
Aug	1	13		4	1	8	2		15	21	13	14					17	42	15	18
Sep		9	1	2		1		1	12	11	14	17	1	2		1	13	23	15	21
Oct	10	7	10	10	2		3	1	10	14	9	17		1	1		22	22	23	28
Nov	27	13	16	2	5		10	3	24	27	15	20	1	1	1		57	41	42	25
Dec	3	8	3	4	2	1	7	1	21	28	16	24	2				28	37	26	29
1943 Totals	54	101	38	58	10	60	26	22	116	225	125	177	4	7	2	2	134	393	191	259

LOSSES OF CARRIER TYPE AIRCRAFT OUTSIDE THE CONTINENTAL LIMITS
In Operational Accidents by Type of Flight

	Combat Mission				Search or Reconnaissance				All Other Flights				Not in Flight				Total			
	VF		VB/T		VF		VB/T		VF		VB/T		VF		VB/T		VF		VB/T	
	Car.	Land	Car.	Land	Car.	Land	Car.	Land	Car.	Land	Car.	Land	Car.	Land	Car.	Land	Car.	Land	Car.	Land
1944 Jan	8	18	13	5	2	2	16	5	29	47	19	20					39	67	48	30
Feb	17	9	12	7	4		7	4	12	23	14	25	1			2	34	32	33	38
Mar	7	5	11	3	5		17	1	19	26	14	21					31	31	42	25
Apr	15	11	21	9	13		16	6	12	44	13	28	2		1		42	55	51	43
May	7	6	2	3	5	2	6	4	23	37	6	23				1	35	45	14	31
Jun	45	11	91	2	9		17	4	22	22	22	23	12	3	6		88	36	136	29
Jul	35	11	26	7	9	4	10	6	18	37	13	29			1	3	62	52	50	45
Aug	4	8	5		10	2	11	5	25	32	19	30	5	4			44	46	35	35
Sep	31	10	29	2	9	1	16	6	21	33	19	39	5		13	1	66	44	77	48
Oct	114	21	83	7	33	1	23	2	32	41	26	27	30	1	6		209	64	138	36
Nov	35	15	25	3	10	1	11	5	41	52	28	34	6	4	4	1	92	72	68	43
Dec	52	26	7	5	7	1	9	5	48	51	15	37	72	2	65	14	179	80	96	61
1944 Totals	370	151	325	53	116	14	159	53	302	445	208	336	133	14	96	22	921	624	788	464
1945 Jan	161	35	39	1	15	1	13	3	23	79	8	51	27	4	4	3	226	119	64	58
Feb	83	22	27	5	21	1	12	3	41	59	15	33	9	7	2	7	154	89	56	48
Mar	143	22	54	9	6	2	10	2	36	75	11	22	22	2	6	1	207	101	81	34
Apr	148	28	32	6	7	7	9	6	10	61	4	35	26	7	5		191	103	50	47
May	77	32	24	12	1	4	1	10	22	67	13	39	12	2	3	1	112	105	41	62
Jun	47	44	5	7	4	3	4	8	33	65	18	27	25	6	40	11	109	118	67	53
Jul	65	54	34	7	11	3	6	2	39	59	11	25	10	2	5	1	125	118	56	35
Aug	26	18	18	1	5	6	2	3	16	15	5	15					47	39	25	19
1945 Totals	750	255	33	48	70	27	57	37	220	480	85	247	131	30	65	24	1171	792	440	356
Grand Total	1225	536	661	185	196	103	245	122	701	1215	473	861	268	51	167	48	2390	1905	1547	1215

SORTIES

Shown in a single table for carrier and land-based squadrons in action during the month. The number of squadrons in action and the aircraft on hand are also shown.

Since it was not until January 1944 that squadrons were required to report all flights during the month, applicable information is not available for the earlier years of the war.

The following will define the terms used:

Action Sorties - the number of flights on which the enemy was either attacked or engaged.

Non-Action Sorties - the number of flights, either in or out of combat, in which no contact with the enemy was made. For combat flights, this includes such types of employment as search and reconnaissance, combat air patrol, and anti-submarine patrol.

Number of squadrons - the number reporting action during the month.

Number of aircraft - reported on hand by the squadrons in action.

[illegible] sums of squadron reports were the basic source.

		Squadrons	A/C on Hand	Action	Non-Action	Total	Squadrons	A/C on
				J A N U A R Y				
CV and CVL	VF		363	1,386	6,643	8,029		36
	VB/T		355	1,289	5,584	6,873		34
CVE	VF		64	23	961	984		10
	VB/T		78	95	1,064	1,159		10
Total	VF	15	427	1,409	7,604	9,013	20	47
	VB/T	26	433	1,384	6,648	8,032	29	44
LAND	VF	13	282	1,363	4,120	5,483	10	21
	VB/T	11	193	1,319	3,684	5,003	11	23
				M A Y				
CV and CVL	VF		229	402	1,382	1,784		45
	VB/T		219	500	1,212	1,712		42
CVE	VF							18
	VB/T							13
Total	VF	7	229	402	1,382	1,784	27	63
	VB/T	11	219	500	1,212	1,712	33	53
LAND	VF	13	274	1,952	7,397	9,349	14	31
	VB/T	13	296	3,006	3,117	6,123	11	24
				S E P T E M B E R				
CV and CVL	VF		539	5,354	4,679	10,033		53
	VB/T		457	5,154	2,355	7,509		49
CVE	VF		272	1,727	3,082	4,809		30
	VB/T		174	931	2,197	3,128		20
Total	VF	32	811	7,081	7,761	14,842	35	84
	VB/T	40	631	6,085	4,552	10,637	44	69
LAND	VF	23	462	3,607	7,538	11,145	26	54
	VB/T	11	225	2,018	2,342	4,360	11	26

SORTIES BY SQUADRONS IN ACTION

For Carrier and Land Squadrons Operating Carrier Type Aircraft

1944

on	Total	Squadrons	A/C on Hand	Action	Non-Action	Total	Squadrons	A/C on Hand	Action	Nor
				F E B R U A R Y					M A R C H	
	8,029		367	2,050	3,058	5,108		331	887	
	6,873		340	1,986	1,918	3,904		309	843	
	984		104	125	1,575	1,700		29	14	
	1,159		108	396	2,003	2,399		20	13	
	9,013	20	471	2,175	4,633	6,808	13	360	901	
	8,032	29	448	2,382	3,921	6,303	18	329	856	
	5,483	10	213	1,789	4,007	5,796	14	389	1,313	
	5,003	11	236	1,958	2,440	4,398	16	343	4,066	
				J U N E					J U L Y	
	1,7[illegible]		465	4,166	4,863	9,029		532	4,715	
	1,7[illegible]		423	3,380	3,003	6,383		515	5,164	
			180	895	2,304	3,199		199	1,838	
			113	325	1,996	2,321		129	832	
	1,784	27	645	5,061	7,167	12,228	29	731	6,553	
	1,712	33	536	3,705	4,999	8,704	37	644	5,996	
	9,349	14	317	1,563	6,651	8,214	15	294	2,924	
	6,123	11	244	1,574	3,582	5,156	9	163	2,116	
				O C T O B E R					N O V E M B E R	
	10,033		536	4,642	6,508	11,150		713	2,453	
	7,509		493	3,811	2,538	6,349		513	1,944	
	4,809		304	1,603	3,187	4,790				
	3,128		201	892	1,730	2,622				
	14,842	35	840	6,245	9,695	15,940	17	713	2,453	
	10,637	44	694	4,703	4,268	8,971	28	513	1,944	
	[illegible],145	[illegible]6	[illegible]5	[illegible],[illegible]7	[illegible],266	[illegible],013	25	538	5,148	
	4,360	11	267	1,938	4,397	6,335	12	243	1,027	

Aircraft

A/C on Hand	Action	Non-Action	Total	Squadrons	A/C on Hand	Action	Non-Action	Total
	MARCH					APRIL		
331	887	3,063	3,950		406	2,538	3,247	5,785
309	843	3,098	3,941		346	2,409	1,787	4,196
29	14	304	318		153	74	2,367	2,441
20	13	382	395		78	173	1,311	1,484
360	901	3,367	4,268	22	559	2,612	5,614	8,226
329	856	3,480	4,336	27	424	2,582	3,098	5,680
389	1,313	7,357	8,670	17	312	1,536	6,168	7,704
343	4,066	3,525	7,591	16	361	3,320	4,993	8,313
	JULY					AUGUST		
532	4,715	4,164	8,879		325	580	2,178	2,758
515	5,164	2,399	7,563		333	591	1,816	2,407
199	1,838	2,329	4,167		38	6	326	332
129	832	2,701	3,533		21	3	274	277
731	6,553	6,493	13,046	12	363	586	2,504	3,090
644	5,996	5,100	11,096	17	354	594	2,090	2,684
294	2,924	5,105	8,029	22	439	4,331	6,725	11,056
163	2,116	2,297	4,413	10	198	2,352	2,409	4,761
	NOVEMBER					DECEMBER		
713	2,453	5,084	7,537		632	1,600	6,393	7,993
513	1,944	1,606	3,550		261	260	1,296	1,556
					144	191	973	1,164
					55	11	281	292
713	2,453	5,084	7,537	19	776	1,791	7,366	9,157
513	1,944	1,606	3,550	26	316	271	1,577	1,848
978	5,148	9,490	14,638	26	590	2,958	12,575	15,533
243	1,027	5,217	6,244	13	254	461	5,026	5,483

		Squadrons	A/C on Hand	Action	Non-Action	Total	Squad
				J A N U A R Y			
CV and CVL	VF		695	4,613	7,908	12,521	
	VB/T		250	2,092	835	2,927	
CVE	VF		356	1,165	5,972	7,137	
	VB/T		208	767	2,395	3,162	
Total	VF	33	1,051	5,778	13,880	19,658	4
	VB/T	36	458	2,859	3,230	6,089	3
LAND	VF	21	430	2,433	9,178	11,611	1
	VB/T	9	191	654	3,430	4,084	1
				M A Y			
CV and CVL	VF		763	3,654	10,619	14,273	
	VB/T		315	2,318	1,379	3,697	
CVE	VF		397	1,424	6,595	8,019	
	VB/T		219	1,657	2,551	4,208	
Total	VF	46	1,160	5,078	17,214	22,292	3
	VB/T	43	534	3,975	3,930	7,905	3
LAND	VF	27	601	2,663	12,733	15,396	2
	VB/T	15	299	3,665	5,266	8,931	1
T O T A L S				1944			
		**	**				**
CV and CVL	VF		453	30,773	51,262	82,035	
	VB/T		380	27,331	28,612	55,943	
CVE	VF		124	6,496	17,408	23,904	
	VB/T		81	3,671	13,939	17,610	
Total	VF	21	577	37,269	68,670	105,939	1
	VB/T	28	461	31,002	42,551	73,553	1
LAND	VF	18	388	33,231	87,399	120,630	8
	VB/T	12	272	25,161	43,119	68,280	1

** SQUADRONS AND AIRCRAFT ON HAND ARE AVERAGES FOR 12, 8, AND 20 MONTHS.

SORTIES BY SQUADRONS IN ACTION

For Carrier and Land Squadrons Operating Carrier Type Aircraft

1945

Total	Squadrons	A/C on Hand	Action	Non-Action	Total	Squadrons	A/C on Hand	Action
			FEBRUARY					MARCH
12,521		901	3,117	8,336	11,453		1,097	6,107
2,927		326	1,235	1,935	3,170		405	3,188
7,137		216	1,132	2,997	4,129		382	1,823
3,162		127	475	1,669	2,144		208	1,014
19,658	40	1,117	4,249	11,333	15,582	54	1,479	7,930
6,089	34	453	1,710	3,604	5,314	48	613	4,202
11,611	19	413	3,324	6,712	10,036	22	469	3,021
4,084	10	240	4,128	1,660	5,788	13	288	4,564
			JUNE					JULY
14,273		642	997	5,929	6,926		829	5,383
3,697		264	677	1,788	2,465		339	2,949
8,019		336	2,357	4,497	6,854		74	102
4,208		186	1,604	1,944	3,548		25	34
22,292	38	978	3,354	10,426	13,780	29	903	5,485
7,905	36	450	2,281	3,732	6,013	29	364	2,983
15,396	23	604	2,985	15,900	18,885	26	620	2,540
8,931	14	341	2,835	6,939	9,774	15	306	1,785
			1945					GRAND TOTALS
	**	**				**	**	
82,035		838	33,026	75,601	108,627		607	63,799
55,943		328	17,563	14,257	31,820		359	44,894
23,904		278	11,748	33,136	44,884		186	18,244
17,610		154	7,829	14,848	22,677		110	11,500
105,939	40	1,115	44,774	108,737	153,511	28	792	82,043
73,553	38	481	25,392	29,105	54,497	32	469	56,394
120,630	24	508	21,171	80,686	101,857	20	436	54,402
[illegible]	12	[illegible]	[illegible]	[illegible]	[illegible]	12	[illegible]	[illegible]

20 MONTHS.

:raft

A/C on Hand	Action	Non-Action	Total	Squadrons	A/C on Hand	Action	Non-Action	Total
	MARCH					APRIL		
1,097	6,107	8,548	14,655		840	6,339	13,469	19,808
405	3,188	1,293	4,481		346	3,733	1,209	4,942
382	1,823	4,077	5,900		404	3,702	7,454	11,156
208	1,014	2,262	3,276		219	2,278	3,064	5,342
1,479	7,930	12,625	20,555	47	1,244	10,041	20,923	30,964
613	4,202	3,555	7,757	45	565	6,011	4,273	10,284
469	3,021	5,779	8,800	24	494	3,628	8,896	12,524
288	4,564	3,149	7,713	13	295	3,430	4,696	8,126
	JULY					AUGUST		
829	5,383	10,837	16,220		933	2,816	9,955	12,771
339	2,949	3,164	6,113		375	1,371	2,654	4,025
74	102	1,074	1,176		58	43	470	513
25	34	546	580		36		417	417
903	5,485	11,911	17,396	31	991	2,859	10,425	13,284
364	2,983	3,710	6,693	32	411	1,371	3,071	4,442
620	2,540	13,213	15,753	29	430	577	8,275	8,852
306	1,785	4,916	6,701	7	151	370	3,433	3,803
GRAND TOTALS								
607	63,799	126,863	190,662					
359	44,894	42,869	87,763					
186	18,244	50,544	68,788					
110	11,500	28,787	40,287					
792	82,043	177,407	259,450					
469	56,394	71,656	128,050					
436	54,402	168,085	222,487					
[illegible]	[illegible]	[illegible]	[illegible]					

ENCLOSURE D
WSEG STAFF STUDY NO. 4

FLIGHT HOURS

Shown in quarterly periods for carrier squadrons only. The figures are tabulations of the number of hours flown by squadrons which would normally be assigned to CV's or CVE's for operations. As such they represent the extent of flight from both carrier and shore bases and include both combat and non-combat hours.

Information is based on the records kept by the Flight Statistics Section (Op-531) of DCNO(Air).

FLIGHT HOURS LOGGED BY CARRIER SQUADRONS

From Ship and Shore Bases

Year	Type	1 Jan - 31 Mar	1 Apr - 30 June	1 July - 30 Sept	1 Oct - 31 Dec	TOTAL * CV - CVL	TOTAL * CVE
1942	CV - CVL	56,490		68,522	63,251	188,263	
	CVE	302		23,953	20,163		44,418
	Total	56,792		92,475	83,414		
1943	CV - CVL	113,845	138,243	218,129	331,538	801,755	
	CVE	38,068	67,439	88,433	83,107		277,047
	Total	151,913	205,682	306,562	414,645		
1944	CV - CVL	359,983	515,482	659,063	576,935	2,111,463	
	CVE	170,389	192,941	183,340	169,487		716,157
	Total	530,372	708,423	842,403	746,422		
1945	CV - CVL	723,598	940,965	776,651		2,441,214	
	CVE	237,560	311,790	135,244			684,594
	Total	961,158	1,252,755	911,895		5,542,695	1,722,216
							7,264,911

*Does not include hours flown 1 April - 30 June 1942, information for which is not available.

WSEG

STAFF STUDY NO. 4

ENCLOSURE E

EFFECTIVENESS OF CARRIER OPERATIONS: CARRIER vs. CARRIER

ENCLOSURE E

EFFECTIVENESS OF U. S. CARRIER OPERATIONS

CARRIER VS CARRIER

1. Battle of Midway
2. Battle of the Philippine Sea
3. Battle for Leyte Gulf

The Purpose is to show the offensive and defensive capabilities of U. S. Carrier Forces in action against enemy carrier forces.

Prepared by

AVIATION HISTORY SECTION, DCNO(AIR)

November 1950

FAST CARRIER FORCE ACTION IN THE BATTLE OF MIDWAY

3 - 6 June 1942

I. Forces Employed and Location at 0000 4 June

A. United States

1. Carrier Forces

TF-16 - 2 CV, 5 CA, 1 CL, 9 DD
TF-17 - 1 CV, 2 CA, 5 DD

Total Aircraft - 79 VF, 113 VB, 40 VT

020°T, 300 miles from Midway; 275 miles from Jap CV Force

2. Land-Based Air

U. S. Marine	-	28 VF, 36 VB
U. S. Navy	-	6 VT, 30 Patrol Seaplanes
AAF	-	4 B-26, 17 B-17
Total	-	28 VF, 93 VB/T

On Midway

B. Japanese Forces

1. Carrier Forces

4 CV, 2 BB, 2 CA, 1 CL, 12 DD

Aircraft - 90 VF, 144 VB/T

315°T, 350 miles from Midway

2. Surface Force

a. Main Group - 3 BB
b. Aleutian Group* - 1 CVL, 4 BB, 3 CL, 15 DD

300°T, 900 miles from Midway

3. Occupation Force

2 BB, 8 CA, 2 CL, 1 XCL, 23 DD
10 Transports, 4 Seaplane Tenders, 6 Minesweepers, and 6 Sub-chasers

500 miles west of Midway

4. Midway Submarine Group - 15 SS

Patrolling across the Hawaiian Chain, 250-700 miles [illegible] of Midway

5. Northern Force (to Aleutians)

1 CV, 1 CVL, 4 CA, 2 CL, 2 XCL, 9 DD, 6 SS, 3 AP

1500 miles northeast of Midway

*Took no part in the action at Midway but did rejoin Midway forces after the battle.

ENCLOSURE B

II. General Account of Action

The Japanese attacked Midway in June 1942, intent on capturing the atoll and luring the United States Fleet into a decisive engagement. At the same time they launched a diversionary attack against the Aleutians, but since the United States naval forces were not diverted, the campaign did not affect the outcome at Midway. However, two Japanese carriers assigned to the Aleutians Group and one assigned to support could not be present at Midway on 4 June.

CINCPAC's intelligence informed him of Japanese objectives, their air and surface strength, the direction from which they would strike and the approximate time of attack. This enabled CINCPAC to increase Midway defenses and rally his three carriers with supporting cruisers and destroyers. This attack group was directed to fight a battle of attrition.

The Japanese converged on Midway in separate units the night of the third. The Mobile Force with the four carriers approached from the northwest. The Main Force also approached from the northwest and on 3 June split into the Main Group of three battleships and the Aleutian Support Group of one carrier and four battleships. The Occupation Force, consisting of the Second Fleet and such varied forces as the transports, seaplane tenders and minesweepers advanced from the west.

The Japanese planned on striking their initial blows with carrier-based aircraft on 4 June. The Americans planned to counter-attack with their carrier force supported by Midway based air and submarines.

On 3 June, a Midway search plane contacted the Japanese Occupation Force then 650 miles west of Midway. This force was unsuccessfully attacked by Army horizontal bombers.

On the morning of 4 June Japanese carrier aircraft attacked Midway doing considerable damage. The carrier duel that followed was influenced by a number of factors. The Japanese were slow in sending out search planes, evidently because they were certain no American carriers were in the vicinity, and thus were unprepared for attack by U. S. carrier aircraft. Initial U. S. carrier strikes were based on a message that they intercepted from a Navy Patrol plane which inaccurately located the Japanese carriers. As a result the bombers from one American carrier failed to find and attack the Japanese. Midway based aircraft, which attacked the Japanese first, did not secure any hits, but did keep the enemy off balance until U. S. carrier air arrived.

American carrier-based air destroyed the four Japanese carriers of the Mobile Force and forced the Japanese to retire and cancel the Midway occupation. The Americans lost one first line carrier, which was damaged by Japanese aircraft and later sunk by submarine.

The action continued for two more days during which air power sank one Japanese cruiser, damaged a second and two destroyers. The action ended on 6 June.

During the four days of the battle the Army Air Force flew 60 bomber sorties, dropping 92 tons of bombs. Navy and Marine land-based aircraft flew 46 bomber sorties against enemy ships, and dropped 14 tons of bombs. In these attacks no crippling hits were made on the Japanese force. Carrier-based naval air flew 273 sorties in which they attacked enemy ships and dropped 83 tons of bombs and 17 torpedoes. Accompanying fighters flew 36 action sorties.

As a result of this action, the Japanese lost 4 aircraft carriers and 1 heavy cruiser, received heavy damage to 1 heavy cruiser and light damage to 2 destroyers to our carrier air attack. One tanker was lightly damaged by a PBY torpedo attack. Over 200 aircraft were lost, of which 69 were reported shot down by our carrier planes and others destroyed by

land-based air, AA fire, or lost with the ship. Japanese report 258 planes of all types lost in the Midway operation. Of the 234 carrier planes with which they began the battle, 48 were lost in aerial combat or to AA fire and 186 lost aboard carriers or making water landings.

American losses were 1 carrier and 1 destroyer. Land-based losses were 40 aircraft, carrier plane losses were reported as 75 in carrier action reports and 92 in the U. S. Naval War College Study of the battle. Aircraft loss logs, however, list 100 carrier planes lost as follows: 40 to enemy aircraft, 18 to ships AA, 30 operational, and 12 lost with the ship.

OFFENSIVE ACTION BY FAST CARRIER FORCES IN THE BATTLE OF MIDWAY

3 - 6 June 1942

				-- SORTIES --				---------- OWN AIRCRAFT ----------						----- ENEMY AIRCRAFT -----				
														Engaged		Destroyed Air		
Date	Target	Task Desig.	Type A/C	Total	Attacking Target	Tons Bombs	Rockets	Engaging En. A/C	Dest. by En. A/C	Encountered AA	Character of AA	Dest. by AA	Op. Loss	VF	VB/T	VF	VB/T	Ground
4 June	Escort	17	VF	6				6	1				1	28		6		
	Comb.Ships	17	VB	31	27	12		13	5	27			2	12	1	1		1
			VT	12	5	5		12	9	5		1	2	1		1		
	Search & Recco	17	VB	10				4						10				
	Escort	16	VF	10				10					1	25		15		
	Comb. Ships	16	VB	58	57	22		21	5	57		7	8	59				
	Comb. Ships	16	VT	29	29	12		29	15	29		10		34		2		
5 June	Comb. Ships	16	VB	59	59	13				59		1	1					
6 June	Escort	16	VF	20	14					14								
	Comb. Ships	16	VB	61	61	36				61		1						
	Comb. Ships	16	VT	3														
								TOTAL OFFENSIVE										
	Escort		VF	36	14			16	1	14			2	53		21		
	Comb. Ships		VB	229	224	83		34	10	224		9	11	71	1	1		1
	Comb. Ships		VT	44	34	17		41	24	34		11	2	35		3		
	Search & Recco		VB	10				4						10				

DEFENSIVE ACTION BY FAST CARRIER FORCES IN THE BATTLE OF MIDWAY

3 - 6 June 1942

Date	Mission	Task Desig.	OWN AIRCRAFT: Type A/C	Sorties	Engaging En. A/C	Losses: A/C	Losses: AA	Losses: OP	ENEMY AIRCRAFT: Attacking VF	Attacking VB/T	Tactics	Ordnance	Engaged VF	Engaged VB/T	Destroyed By A/C VF	Destroyed By A/C VB/T	Destroyed By A/C Gr.	Destroyed By AA	OWN SHIPS: Unit Attacked	Sunk Type	Sunk No.	Damaged Type	Damaged No.
4 June	CAP Local	16	VF	26	24	3		1					50	54	6	24			17			CV	1
	CAP Local	17	VF	29	19	1							7	13	5	9							
			TOTAL DEFENSIVE																				
			VF	55	43	4		1					57	67	11	33							

* Fifteen VB's of 18 VB and 6 VT launched, attacked Yorktown at 1205 and scored 3 hits. By 1421, Yorktown was steaming at 15 knots and at 1437 increased her speed to 19 knots. At 1432 when a second Japanese attack of 16 VT was detected 40 miles out, Yorktown vectored out 6 VF and launched 8 more to intercept the attack. The attack made at 1441 scored 2 torpedo hits. Yorktown was abandoned at 1500, reboarded by a salvage crew and taken in tow at 1308 next day and torpedoed by Japanese submarine on the 6th and sunk on the 7th.

FAST CARRIER FORCE ACTION IN THE BATTLE OF THE PHILIPPINE SEA

19 - 20 June 1944

I. Forces Employed and Location, 19 June

A. United States Forces

1. Fast Carrier Task Force (TF 58)

7 CV, 8 CVL, 7 BB, 8 CA, 13 CL, 63 DD
Aircraft - 484 VF, 416 VB/T

2. Land-Based Air

a. Saipan

VP-16, 6 PBM's

b. Other land-based patrol planes were available for search from Eniwetok, Majuro, Kwajalein, Tarawa, Manus, Wadke, Emirau, and Green Island. Eniwetok and Manus, the nearest of these bases, are a thousand miles from Saipan.

3. Submarines

15 - Some stationed in areas between the Marianas and the Philippines and others between the Marianas and Japan.

B. Japanese Forces

1. Fast Carrier Force

6 CV, 3 CVL, 5 BB, 11 CA, 2 CL, 25 DD (plus train 6 AO, 6 DD)
Aircraft - 450

2. Land-Based Air

200 mixed types in the Marianas

3. Submarines

(Information not available, probably some in the area but no attacks made on fast carrier force on these days.)

II. General Account of Action

After U. S. forces landed at Saipan 15 June, the Japanese Navy sortied from the Philippines to annihilate the enemy's fleet and stop the advance upon the chain of islands that served as inner fortresses to Japan. The force they assembled included most of the striking power of the Combined Fleet and was surpassed only by the U. S. Fifth Fleet which it sought to destroy.

The fast carrier force of the Fifth Fleet, after four days of preliminary attack, was protecting the landing forces in the Marianas and, in conjunction with the escort carriers, providing support for troops.

A. U. S. submarine reported the Japanese Fleet movement from the Philippines, and enabled the Commander of the Fifth Fleet to prepare for fleet action. He postponed the landing on Guam, moved many of the supply ships away from Saipan, left all close support to the escort carriers, stationed a patrol plane squadron at Saipan, recalled two fast carrier groups then striking the Bonins, and withdrew the battleships from the fast carrier groups to form a battle line. He deployed the fast carrier force and the battle line west of Saipan, taking care to maintain positions that would prevent enemy fleet units from slipping around his carriers and attacking the landing forces at night.

For four days the exact location of the enemy fleet was unknown, but on the morning of 19 June Task Force 58 was attacked by enemy aircraft launched from carriers on one side and land bases on the other. Aircraft from as far away as the Bonins flew in for this attack. Task Force 58 was 90 miles northwest of Guam when its fighters reported enemy aircraft taking off from that island. The Japanese carriers, then about 355 miles from the Task Force, prepared to launch shuttle attacks without exposing their fleet to counter-attack. Their first strike was detected in the distance by radar at 1000.

The Japanese attack developed in four stages and covered the entire daylight period of 19 June. From 0530 until 1000, our fighters engaged enemy aircraft launched from Guam. From 1000 until 1130, the enemy's carrier-based aircraft attempted to attack the carriers, sending in two groups of 50 to 75 planes each. Our fighters intercepted both groups and destroyed most of the planes. A few, however, broke through and ran into heavy anti-aircraft fire as they closed the ships. One of these hit the South Dakota with a small bomb, one crash dived into the Indiana, while others scored near misses on the Minneapolis, the Bunker Hill and the Wasp. From 1130 to 1430 small groups and isolated enemy planes were intercepted and destroyed at distances of 40 to 60 miles from the fleet. After 1400, a few attacks were made on the fleet, but at 1820 our fighters intercepted and attacked what appeared to be an entire air group landing on Guam.

After breaking what was the heaviest enemy air offensive up to that time, the fast carrier forces prepared to counter-attack. During the night they made a fast run to the west after detaching Task Group 58.4 of 1 CV, 2 CVL, and screen to guard the landing forces. Search missions were negative on the morning of 20 June but at 1518 contact was established with the enemy fleet reported 275 miles away. T.F. 58, after noting that a strike would be at maximum range and that the returning planes would have to land after dark, determined to attack, since this would probably be his last chance to engage the enemy fleet.

[illegible] the enemy fleet just before sunset after flights of 300 to 330 miles. Against light air opposition and an umbrella of AA fire they pressed the attack home, sinking 1 carrier, and 2 oilers and damaging 4 carriers, 1 battleship, 1 cruiser and 1 oiler. (In addition, 2 CV's were sunk by submarines on the 19th.)

On the return flight a large number of aircraft went into the sea out of fuel. Others crashed while making night landings, bringing operational accidents to a total of 80 out of 249 aircraft. However, 77% of the downed personnel were rescued.

Another strike was launched early the next morning, but during the night the Japanese had passed out of range, and no contact was made.

Thus the Battle of the Philippine Sea ended on 20 June. During the first day we destroyed the air arm of the Japanese Fleet by shooting down 365 planes in aerial combat, 19 with ships AA, and destroying 15 on the ground while losing 30 fighters and 10 bombers to enemy aircraft. We also lost 8 fighters and 3 bombers operationally and 6 fighters to AA fire over Guam.

On 20 June, 26 enemy aircraft were shot down for 6 fighters and 6 bombers lost to enemy aircraft, 6 bombers destroyed by anti-aircraft fire and 80 planes in operational accidents.

OFFENSIVE ACTION BY FAST CARRIER FORCES IN THE BATTLE OF THE PHILIPPINE SEA

19 - 20 June 1944

Date	Target	Task Desig.	Type A/C	Sorties Total	Sorties Attacking Target	Sorties Tons Bombs	OWN AIRCRAFT: Engaging En. A/C	OWN AIRCRAFT: Dest. by En. A/C	OWN AIRCRAFT: Dest. by AA	OWN AIRCRAFT: Op. Loss	ENEMY AIRCRAFT: Engaged VF & VB/T	ENEMY AIRCRAFT: Destroyed Air VF & VB/T	ENEMY AIRCRAFT: Destroyed Ground
19 June	Airfields	58.1	VF	43	22	1	1				9	6	3
		58.2	VF	17	8		3	1			11	8	
		58.3	VF	12	8		7				6	6	3
		58.4	VF	8	8								1
		58.1	VB/T	78	92	43			4				6
		58.2	VB/T	41	45	29	6		1	2	2	1	
		58.3	VB/T	38	36	21			1				2
		58.4	VB/T	12	10	4							
		Total	VF	80	46	1	11	1			26	20	7
			VB/T	169	183	97	6		6	2	2	1	8
20 June	Comb.Ships	58.1	VF	49	33	6	9	3		10	29	7	
		58.2	VF	30	20		25	1		2	15	7	
		8.3	VF	23	8		14	2		2	22	8	
		58.1	VB/T	50	45	52	9		6	25	12		
		58.2	VB/T	47	47	39	23	3		30	17		
		58.3	VB/T	40	38	22	36	3		11	58	4	
		Total	VF	102	61	6	48	6		14	66	22	
			VB/T	137	130	113	68	6		66	87	4	

DEFENSIVE ACTION BY FAST CARRIER FORCES IN THE BATTLE OF THE PHILIPPINE SEA

19 - 20 June 1944

				OWN AIRCRAFT				ENEMY AIRCRAFT		
						Losses			Destroyed By A/C	
Date	Mission	Task Desig.	Tyoe A/C	Sorties	Engaging En. A/C	A/C	OP	Engaged VF & VB/T	VF	VB/T
19 June	CAP Target	58.1	VF	114	74	3	1	155	91	
		58.2	VF	110	85	2	3	137	73	
		58.3	VF	103	72	3	1	126	80	
		58.4	VF	76	56	5	1	130	74	
		Total		403	287	13	6	548	318	
19 June	Search & Miscellaneous	58.1	VF	2	2			4		4
		58.2	VF	3	3	1		2		1
		58.3	VF	9	9	1		17		14
		58.4	VF	3	2			5		4
		58.1	VB/T	2						
		58.2	VB/T	3	3	1		2		1
		58.3	VB/T	11	4			5		1
		58.4	VB/T	3	3			3		1
		Total	VF	17	16	2		28		23
			VB/T	19	10	1		10		3

FAST CARRIER FORCE ACTION IN THE BATTLE FOR LEYTE GULF
24 - 26 October 1944

I. Forces Employed and Location on 24 October

A. U. S. Forces

1. Fast Carrier Task Force (38) - 8 CV, 8 CVL, 6 BB, 6 CA, 9 CL, 58 DD
Aircraft - 543 VF, 423 VB/T

Three groups of Task Force 38 were positioned about 125 miles apart in a line stretching northwest and southeast along the east coast of the Philippines.

a. Task Group 38.1 - 3 CV, 2 CVL, 4 CA, 2 CL, 14 DD
Aircraft - 192 VF, 147 VB/T

Steaming east to Ulithi for rest and replenishment, well away from the area of action on 24 October.

b. Task Group 38.2 - 1 CV, 2 CVL, 2 BB, 3 CL, 16 DD
Aircraft - 85 VF, 63 VB/T

In central location, about 60 miles off San Bernardino Straits.

c. Task Group 38.3 - 2 CV, 2 CVL, 2 BB, 4 CL, 13 DD
Aircraft - 140 VF, 104 VB/T

In northernmost position, east of central Luzon about 60 miles off Pollilo Island.

d. Task Group 38.4 - 2 CV, 2 CVL, 2 BB, 2 CA, 15 DD
Aircraft - 126 VF, 104 VB/T

In the southern position, 60 miles off the southern tip of Samar.

2. Escort Carrier Group (77.4) - 16 CVE, 9 DD, 11 DE
Aircraft - 281 VF, 180 VB/T

About 50 miles east of Leyte Gulf.

3. Battleship Group - 6 OBB, 4 CA, 4 CL, 26 DD

Inside Leyte Gulf.

4. U. S. Submarines - 20 deployed west and north of the Philippines, none in the combat areas on 24 October.

B. Japanese Forces

1. Carrier Group (Northern Force) - 1 CV, 3 CVL, 2 BB-XCV, 3 CL, 8 DD
Aircraft - 90 VF, 36 VB/T

About 250 miles east of northern Luzon, 150 miles north and east of Task Group 38.3 at 0800.

2. Surface Forces

a. Central Force - 5 BB, 10 CA, 2 CL, 15 DD

Passed south of Mindoro Island and entered Sibuyan Sea, about 220 miles south and east of Task Group 38.2 at 0800.

b. Southern Force - 2 BB, 3 CA, 1 CL, 4 DD

Off Negros Island approaching Mindanao Sea, about 220 miles east of Task Group 38.4 at 0900.

3. Land-Based Air - Operational Aircraft
Navy 400 - mostly carrier types
Army 150

Largely concentrated in central Manila plain.

4. Submarines - 10, assigned to Leyte operation, were enroute; 3 on station off Leyte on 25 October; all on station by 26 October.

II. General Account of Action

Our Leyte landings, begun on 17 October, provoked a violent Japanese reaction. Putting into effect their "Sho" plan, they despatched all available naval vessels, organized in three groups, to destroy our landing and support forces. A carrier force (later designated Northern Force) with a handful of ill-trained pilots, approached from Japan to lure our carriers away from Leyte and so leave our occupation forces unprotected. Heavy surface forces (called Southern and Central Forces) approached through Suragao and San Bernardino Straits planning to join in Leyte Gulf and wreak destruction on our support shipping.

The U. S. Seventh Fleet was responsible for carrying out the Leyte landing. The old battleships and escort carriers attached gave direct support to the invasion. The Fast Carrier Force of the Third Fleet also gave direct support but was primarily responsible for isolating the area and protecting the operations against the enemy fleet.

The Battle for Leyte Gulf consisted of four major engagements. On 24 October, U. S. carrier aircraft engaged land-based air and attacked surface ships in the Sibuyan Sea. On 25 October, surface ships met before daylight in the Battle of Surigao Straits; U. S. carriers engaged battleships and carriers in the Battle off Cape Engano; and U. S. escort carriers were engaged with surface forces in the Battle off Samar. On 26 October, U. S. forces mopped up remnants of a badly defeated enemy.

The main action of the Fast Carrier Force was against the Japanese carriers on 25 October but it was also involved in other actions. One group of the force attacked the retiring Central Force late in the day of the Battle off Samar, and all four groups participated in the "mopping up" on the 26th. On the day preceding the main action, two groups attacked Japanese forces attempting passage of inland waters with particular emphasis on the Central Force in the Sibuyan Sea. They sank the Musashi (BB) and one destroyer, damaged several ships, and apparently put the force to rout. Other action on the 24th was the Japanese air attack on the northernmost of the fast carrier groups. This attack, launched from land and carrier bases, was driven off by our fighters, but one plane bombed and was responsible for sinking the Princeton (CVL). Aircraft launched from Japanese carriers failed to find our task group and only a few succeeded in reaching Luzon.

After one of our search planes sighted the Japanese carrier force on the afternoon of the 24th, Task Force 38 (except T. G. 38.1) advanced during the night to meet the threat from the north.

In the Battle off Cape Engano which ensued, American planes making their first strike at 0840, 25 October, destroyed the defending planes, sank one light carrier and a destroyer and damaged the remaining carriers and a light cruiser. Before this strike had returned, the escort carriers of the Seventh Fleet, which were then under attack off Samar, requested help. In response, Commander, Third Fleet directed Task Groups 38.1 (which had been recalled and was nearly within striking range of the Northern Force), Task Group 38.2, and all of the battleships to aid the forces in the Leyte area.

Task Groups 38.3 and 38.4 continued to attack the Northern Force. A second strike, launched before planes of the first strike returned, so damaged a light carrier that it could be towed by cruisers. A third strike, launched at 1300, sank the large carrier and the remaining light carrier. The fourth and fifth strikes damaged the battleships.

Japanese losses in these engagements were 3 BB, 1 CV, 3 CVL, 4 CA, 4 CL, and 9 DD. Fast carrier aircraft were responsible for sinking the following:

24 October - Sibuyan Sea - 1 BB, 1 DD
25 October - Cape Engano - 1 CV, 2 CVL, and 1 CVL, 1 CL by air and surface
26 October - Mopping Up - 1 CL, 1 DD

The U. S. Fast Carrier Force lost one ship - the Princeton.

Operations of Task Force 38

Date	Type A/C	Total Sorties	Sorties against JAP Forces			Defensive Sorties over Task Force			Other Sorties		
			Total	Northern	Central	Total	Engaging Enemy	Not Engaging Enemy	Search	Fighter Sweep	ASP
24 October	VF	5[illegible]	102		102	293	116	177	94	18	1
	VB/T	2[illegible]	157		157				76		63
25 October	VF	6[illegible]	267	201	66	300	6	294	55		4
	VB/T	4[illegible]3	407	326	81				31		55
26 October	VF	4[illegible]7	109		109	237	2	235	33	19	4
	VB/T	235	148		148				28		59
Total	VF	1,5[illegible]6	478	201	277	830	124	706	182	37	9
	VB/T	1,024	712	326	386				135		177

ENCLOSURE A

Date	Type A/C	AERIAL COMBAT — Enemy Aircraft Engaged		Enemy Aircraft Destroyed		Own A/C Engaging Enemy A/C	Own A/C Encountering AA	OWN LOSSES — Strikes against Jap Fleet			Other Action Sorties			Total Losses *			ORDNANCE EXPENDED — Against Fleet		Other **	
		VF	VB/T	VF	VB/T			AA	A/C	OP	AA	A/C	OB	AA	A/C	OP	Bombs	Rockets	Bombs	Rockets
24 October	VF	206	113	107	64						1	7	1	1	7	1				
	VB/T	4	8	2	6			17	1	2	1			18	1	2				
25 October	VF	30	4	14	4			4	3	1			2	4	3	3				
	VB/T	14		1				20	1	10			1	20	1	11				
26 October	VF	11	3	11	3			3	1	2				3	1	2				
	VB/T	4		2				6		6	1		2	7		8				
Total	VF	247	120	132	71	191	558	7	4	3	1	7	3	8	11	6	47	365	9	80
	VB/T	22	8	5	6	25	762	43	2	18	2		3	45	2	21	498		27	

* Does not include 3 airplanes lost on flights not detailed above and 24 airplanes lost while not in flight.
** Fighters dropped 3 depth bombs and bombers 1 depth bomb. These are included in the total.

WSEG STAFF STUDY NO. 4

ENCLOSURE F

EFFECTIVENESS OF U. S. CARRIER OPERATIONS: ACTION SUMMARY AND DETAIL OF SELECTED OPERATIONS

EFFECTIVENESS OF U. S. FAST CARRIER OPERATIONS

ACTION SUMMARY AND DETAILS OF SELECTED CAMPAIGNS

1. Fast Carrier Force Action Summary - Pacific - World War II
2. Carrier-Based Air Effort
3. Fast Carrier Force in the Occupation of the Gilbert Islands, 18-24 November 1943 and Wotje, Nauru, and Kwajalein to 8 December 1943
4. Fast Carrier Forces Against Truk, 16-17 February 1944
5. Fast Carrier Force Raid on Western Carolines, 30 March - 1 April 1944
6. Fast Carrier Forces in the Occupation of the Marianas, 11-20 June 1944
7. Fast Carrier Operations in the Philippines, 9-24 September 1944
8. Fast Carrier "Blanket" Operations in Connection with Mindoro Landings, 14-16 December 1944
9. Fast Carrier Operations as a Preliminary to Landings at Okinawa, 18-30 March 1945
10. The Assault on Japan, 10 July-15 August 1945

The Purpose is to show offensive and defensive capabilities of U. S. Carrier Forces in action against enemy land areas.

Prepared by

AVIATION HISTORY SECTION, OPNAV(AIR)

December 1950

FAST CARRIER FORCE ACTION SUMMARY - PACIFIC
WORLD WAR II

Raid, Battle, or Campaign	Dates of Action	Carriers Engaged CV	Carriers Engaged CVL	Action Sorties	Tons Bombs on Target	ENEMY AIRCRAFT Engaged	ENEMY AIRCRAFT Destroyed Air	ENEMY AIRCRAFT Destroyed Ground	OWN LOSSES ON ACTION SORTIES To Enemy AA	OWN LOSSES ON ACTION SORTIES To Enemy A/C	OWN LOSSES ON ACTION SORTIES Operational
1942											
EARLY RAIDS	2/1-4/19	3	0	391	129	53	34	12	7	6	7
Marshall Islands	1 Feb	2		165	59	21	15	10	4	4	6
Rabaul	20 Feb.	1		27		30	17			2	
Wake Island	24 Feb.	1		51	18	1	1	2	1		1
Marcus Island	4 Mar.	1		38	11				1		
Lae Salamaua	10 Mar.	2		104	40	1	1		1		
Tokyo	19 Apr.	1		6	1						
CORAL SEA	4-8 May	2	0	332	139	178	66	21 *	1	21	11
MIDWAY #	3-6 June	3	0	374	100	294	69	140 *	20	41	16
SOLOMONS	7 Aug-4 Feb	4	0	1,162	285	610	200	51	7	43	25
Guadalcanal Landing	7-8 Aug.	3		503	153	126	29	20		11	1
Eastern Solomons	24 Aug.	3		178	28	200	59	10 *	5	10	5
Tonolei	5 Oct.	1		69	12	6	4	4			
Guadalcanal Support	12-16 Oct.	1		89	19	6	5	12			1
Santa Cruz	26 Oct.	2		129	29	216	81	5 *	1	20	18
Guadalcanal Battle	13-14 Nov.	1		96	21	28	7		1	1	
1943											
Kolombangara	24 Jan.	1		58	23						
Rennell Island	30 Jan.	1		16		22	11				
Solomons Support	30 Jan-4 Feb	1		24		6	4			1	
RAIDS	31 Aug-6 Oct	3	4	1,368	518	102	46	49	17	1	16
Marcus Island	31 Aug.	2	1	290	116			7	3		1
Baker Island	1-8 Sept.		2	12		3	3				
Tarawa	18 Sept.	1	2	184	83	2	2	15	4		2
Wake Island	5-6 Oct.	3	3	882	319	97	41	27	10	1	13

Raid, Battle, or Campaign	Dates of Action	Carriers Engaged CV	Carriers Engaged CVL	Action Sorties	Tons Bombs on Target	ENEMY AIRCRAFT Destroyed Engaged	Destroyed Air	Destroyed Ground	OWN LOSSES ON ACTION SORTIES To Enemy AA	To Enemy A/C	Operational
1943											
BOUGAINVILLE	1-11 Nov.	3	2	707	210	371	138	19	8	22	10
Buka-Bonis	1-2 Nov.	1	1	251	88	1	1	19	4		7
Rabaul	5 Nov.	1	1	97	25	118	28		1	8	
Rabaul	11 Nov.	3	2	359	97	252	109		3	14	3
GILBERT ISLANDS #	18 Nov-8 Dec	6	5	2,488	880	194	95	56	12	7	16
Gilbert Islands	18 Nov-5 Dec	5	4	1,401	443	60	39	3	3	2	7
Southern Marshalls	19-26 Nov.	2	1	460	193	21	13	19	4	1	7
Nauru	19 Nov.	1	1	210	81	10	2	2		1	1
Kwajalein	4 Dec.	4	1	287	115	102	40	27	2	3	1
Nauru	8 Dec.	1	1	130	48	1	1	5	3		
1944											
KAVIENG RAIDS	25 Dec 43-4 Jan 44	1	1	281	108	91	28		1	4	
First	25 Dec.	1	1	103	35	4	3		1		
Second	1 Jan.	1	1	88	38	60	14			3	
Third	4 Jan.	1	1	90	35	27	11			1	
MARSHALL ISLANDS	1 Jan-23 Feb	6	6	6,748	1,983	308	189	260	31	7	29
Marshall Islands	1 Jan-23 Feb	6	5	4,948	1,382	43	27	106	15	1	20
Truk #	16-17 Feb.	5	4	1,456	499	213	123	82	13	3	8
Marianas	23 Feb.	3	3	344	102	52	39	72	3	3	1
MILLE STRIKE	19 Mar.	1	0	111	46				3		
WESTERN CAROLINES #	30 Mar-1 Apr	5	6	2,172	712	203	111	46	20	3	15
HOLLANDIA-AITAPE	21-26 Apr.	5	7	2,314	713	39	29	103	5		18

Raid, Battle, or Campaign	Dates of Action	Carriers Engaged CV	Carriers Engaged CVL	Action Sorties	Tons Bombs on Target	Enemy Aircraft Engaged	Enemy Aircraft Destroyed Air	Enemy Aircraft Destroyed Ground	Own Losses On Action Sorties To Enemy AA	Own Losses On Action Sorties To Enemy A/C	Own Losses On Action Sorties Operational
1944											
APRIL-MAY RAIDS	19 Apr-24 May	8	8	3,108	1,140	133	66	126	34	5	4
Sabang	19 Apr	1		62	19	3	3	20	2		
Truk	30 Apr-2 May	5	7	2,283	815	127	60	85	25	5	3
Soerabaja	17 May	1		55	20	2	2	21	1		
Wake & Marcus Island	20,24 May	2	1	708	286	1	1		6		1
MARIANAS #(11-20 June)	11 Jun-8 Aug	8	8	18,533	6,189	1,661	866	276	175	61	157
Marianas	11-30 June	7	8	6,982	2,045	1,263	595	115	82	37	105
Marianas	1 Jul-8 Aug	8	8	7,455	2,726	14	14		20	1	27
Bonin Islands	15-16 June	3	4	478	152	67	41	80	14	2	8
Bonin Islands	24 June	2	2	86	1	141	110			5	
Bonin Island	3-4 July	4	3	873	309	157	92	27	13	13	5
Bonin Islands	4-5 Aug	4	2	872	307	11	7	7	15	1	3
Western Carolines	25-28 July	6	2	1,787	649	8	7	47	23	2	9
Philippine Sea #	19-20 June	7	8	(927)	(217)	(767)	(391)	(15)	(12)	(29)	(88)
BONIN ISLANDS	31 Aug-2 Sept	2	1	533	199	11	11	43	7		4
WAKE ISLAND	3 Sept	0	1	61	34						
PALAU-MOROTAI	6 Sept-3 Oct	8	8	10,371	3,540	756	372	526	63	13	37
Western Carolines	6-18 Sept	8	8	3,889	1,369			5	19	1	7
Philippines #	9-24 Sept	6	7	6,025	2,115	752	370	463	39	12	28
Halmahera ***	15 Sept-3 Oct	2	1	423	56	4	2	30	5		2
Celebes, Borneo	15 Sept	0	2	34				28			

Raid, Battle, or Campaign	Dates of Action	Carriers Engaged CV	Carriers Engaged CVL	Action Sorties	Tons Bombs on Target	ENEMY AIRCRAFT Engaged	ENEMY AIRCRAFT Destroyed Air	ENEMY AIRCRAFT Destroyed Ground	OWN LOSSES ON ACTION SORTIES To Enemy AA	OWN LOSSES ON ACTION SORTIES To Enemy A/C	OWN LOSSES ON ACTION SORTIES Operational
1944											
LEYTE	10 Oct-25 Nov	10	8	12,843	4,329	2,387	1,249	1,013	210	78	117
Ryukyus-Formosa	10-16 Oct.	9	8	4,346	1,530	804	438	366	54	25	15
Philippines	11-30 Oct.	9	8	4,100	1,282	1,039	539	179	74	42	66
Philippines	5-25 Nov.	10	6	4,299	1,471	544	272	498	81	11	36
Western Carolines	22 Nov.	2	2	98	46				1		
Battle for Leyte Gulf #	24-26 Nov.	8	8	(2,629)	(581)	(397)	(214)		(53)	(13)	(27)
MINDORO #	14-16 Dec.	7	6	1,852	330	84	66	208	28		27
1945											
LINGAYEN	3-22 Jan.	8	5	6,705	1,842	221	152	464	98	8	53
Philippines	6-7 Jan.	8	5	1,426	288	41	25	93	9	1	26
Formosa	3-21 Jan.	8	5	2,894	834	120	93	243	36	3	15
South China Sea	12-16 Jan.	8	5	1,709	559	60	34	100	45	4	10
Ryukyus	22 Jan.	7	5	676	161			28	8		2
IWO JIMA	16 Feb-8 Mar	11	5	5,345	1,250	1,260	435	266	52	40	46
Japan	16-25 Feb.	11	5	2,493	376	1,241	420	228	25	38	27
Bonins	18 Feb-8 Mar	11	5	1,932	667	15	11	1	15	2	14
Ryukyus	1 Mar.	7	3	920	207	4	4	37	12	0	5
OKINAWA	18Mar-22 Jun	14	8	25,437	8,713	2,588	1,563	672	235	57	163
Ryukyus #	21-31 Mar.	8	6	5,248	1,640	129	87	40 **	48	2	36
Japan #	18-29 Mar.	10	6	3,054	744	580	252	263 **	48	30	38
Ryukyus	1-30 Apr.	10	6	9,442	3,374	1,155	850	124 **	59	16	45
Japan	7-17 Apr.	7	6	630	238	130	87	77 **	25		3
Ryukyus	1-31 May	9	6	4,000	1,581	337	204	22 **	28	3	25
Japan	13-24 May	5	4	1,777	656	146	66	93 **	18	2	1
Ryukyus	1-10 June	6	3	855	426	17	7		2		5
Japan	3-8 June	5	3	431	54	94	10	53	7	4	10

Raid, Battle, or Campa n	Dates of Action	Carriers Engaged CV	CVL	Action Sorties	Tons Bombs on Target	ENEMY AIRCRAFT Engaged	Destroyed Air	Ground	OWN LOSSES ON ACTION SORTIES To Enemy AA	A/C	Operational
JAPAN #	10 Jul-15 Aug	10	6	12,153	4,382	207	121	1,102	136	11	72
Tokyo	10 Jul-15 Aug	10	6	5,668	1,882	104	64	762	53	7	28
Hokkaido	14 Jul-10 Aug	10	6	2,349	982	2	1	79	32		16
Central Honshu	24 Jul-10 Aug	10	6	2,665	899	75	36	233	67	3	13
Kyushu-Kure	24-28 July	10	6	1,471	619	26	20	28	34	1	15
MANOR ACTIONS	17 May-6 Aug	4	2	957	297				2		4
Maloelap	17 May	1	0	195	80						1
Wake Island	20 June	2	1	388	135				2		1
Wake Island	18 Jul	1	0	167	31						
Wake Island	1 Aug	0	1	39	9						
Wake Island	6 Aug	1	0	168	42						2
TOTAL	1942-1945	20	9	115,923	38,012	11,747	5,904	5,434	1,217	428	845

*Estimated lost aboard enemy carriers or because of sinking enemy carriers.

**Approximations based on proration of force total for campaign.

***Includes 6 CVEs.

Note 1 - Although all ast carrier actions are listed, the figures are low due to incompleteness of information at time of compilation. The error is estimated as less than 20%.

Note 2 - Action for Ra ls, Battles or Campaigns marked # is given in detail in other parts of this report.

ENCLOSURE F

CARRIER BASED AIR EFFORT

Against Land and Shipping

	Total	Action Sorties			SORTIES ATTACKING TARGETS								
					Total			Total Shipping			Total Land		
		Offensive	Defensive	Other **	Sorties	Tons Bombs	No. Rockets	Sorties	Tons Bombs	No. Rockets	Sorties	Tons Bombs	No. Rockets
1941-42													
Total Carrier Based	2,673	2,066	458	149	1,976	707		935	427		1,033	228	
VF	936	505	427	6	456			80			368	2	
VB/T	1,735	1,561	31	143	1,520			855	427		665	226	
Fast Carrier Based	2,559					683							
VF	623					1							
VB/T	1,538					629							
1943													
Total Carrier Based	5,127	4,542	552	33	4,217	1,721		536	291		3,681	1,430	
VF	2,344	1,804	531	5	1,588	4		89			1,499	4	
VB/T	2,783	2,738	21	28	2,629	1,701		447	291		2,182	1,426	
Fast Carrier Based	4,822					1,682							
VF	2,081												
VB/T	2,694					1,682							
1944													
Total Carrier Based	69,128	61,740	5,475	1,913	69,752	21,633	26,826	16,115	5,029	5,111	53,645	16,602	21,719
VF	37,940	32,241	4,633	1,066	37,866	2,264	15,357	8,513	373	3,616	29,355	1,972	11,671
VB/T	31,188	29,499	842	847	31,886	19,069	11,469	7,602	4,526	1,483	24,290	14,544	10,038
Fast Carrier Based	58,425					19,229	18,440	14,689	4,602	4,361	44,371	14,402	14,043
VF	30,773					1,864	14,584	7,547	352	3,578	23,249	1,512	10,966
VB/T	27,331					17,146	3,856	7,142	4,250	783	21,122	12,890	3,077
1945													
Total Carrier Based	70,166	57,599	9,845	2,722	61,951	21,598	155,743	8,372	3,362	11,926	53,579	18,236	143,817
VF	44,774	32,883	9,286	2,605	37,609	5,095	105,504	4,924	726	10,816	32,685	4,369	96,250
VB/T	25,392	24,716	559	117	24,342	16,503	50,239	3,448	2,636	1,110	20,894	13,867	47,567
Fast Carrier Based	50,589				43,603	16,484	76,624	7,713	3,223	9,555	34,328	12,334	63,085
VF	33,026				26,835	4,313	66,825	4,472	703	9,200	21,430	3,425	53,944
VB/T	17,563				16,768	12,171	9,799	3,241	2,520	355	12,898	8,909	9,141

** Includes Search and Reconnaissance.

CARRIER AIR BASED EFFORT

Against Land Targets

	Total Land			Airfields			Military Installations			Transportation Facilities			Other Land		
	Sorties	Tons Bombs	No. Rockets	Sorties	Tons Bombs	No. Rockets	Sorties	Tons Bombs	No. Rockets	Sorties	Tons Bombs	No.Rockets	Sorties	Tons Bombs	No. Rockets
1941-42															
Total Carrier Based	1,033	228		277	63		585	144		34	12		137	9	
VF	368	2		118	1		143	1		10			97		
VB/T	665	226		159	62		442	143		24	12		40	9	
1943															
Total Carrier Based	3,681	1,430		1,185	676		1,764	709		102	32		30	13	
VF	1,499	4		787			666	4		45			1		
VB/T	2,182	1,426		998	676		1,098	705		57	32		29	13	
1944															
Total Carrier Based	53,645	16,602	21,719	16,428	4,052	4,701	20,016	6,276	9,400	1,866	467		15,335	5,721	
VF	29,355	1,972	11,671	10,101	449	3,948	10,837	790	3,164	1,290	117		7,127	616	
VB/T	24,290	14,544	10,038	6,327	3,603	753	9,179	5,486	6,236	576	350		8,208	5,105	
Fast Carrier Based	44,371	14,402	14,043	15,237	3,847	1,391	14,940	5,037	4,321	1,084	343		13,110	5,175	
VF	23,249	1,512	10,966	9,191	386	3,926	7,677	569	3,069	626	57		5,755	500	
VB/T	21,122	12,890	3,077	6,046	3,461	465	7,263	4,468	1,252	458	286		7,355	4,675	
1945															
Total Carrier Based	53,579	18,236	143,817	26,328	8,059	65,212	20,726	7,874	64,073	3,615	1,281	8,899	2,910	1,022	5,633
VF	32,685	4,369	96,250	18,288	2,844	49,088	10,588	1,063	36,805	2,080	227	6,081	1,729	235	4,276
VB/T	20,894	13,867	47,567	8,040	5,215	16,124	10,138	6,811	27,268	1,535	1,054	2,818	1,181	787	1,357
Fast Carrier Based	34,328	12,334	63,085												
VF	21,430	3,425	53,944												
VB/T	12,898	8,909	9,141												

FAST CARRIER FORCE IN THE OCCUPATION OF THE GILBERT ISLANDS, 18-24 NOVEMBER 1943, Including Actions against Nauru, Wotje, and Kwajalein, 19 November, 4 and 8 December

I. Forces Employed

A. United States Forces

1. Assault Force - TF 54

Transport Groups	17 APA, 1 AP, 4 AKA, 2 LSD, 10 DD
Fire Support Groups	7 BB, 6 CA, 3 CL, 15 DD
Air Support Groups	8 CVE, 4 DD
Makin Group	9 LST, 3 LCT, 2 XAP, 2 XAK, 2 DD, 2 DE
Tarawa Group	12 LST, 5 LCT, 1 AP, 1 XAP, 1 AK, 1 XAK, 2 DD, 2 DE
Apamama Group	4 LST, 7 LCT, 1 AP, 2 XAP, 2 XAK, 3 DE

2. Defense Forces and Shore-Based Air - TF 57 (Nearest Base at Nanomea, 500 miles distant)

90 VB(H), 24 VP (Sea), 24 VP(M)(Land), 18 VP(H)(Land), 90 VMF, 72 VMSB, 24 VSO and VJ, 12 VR, 1 AV, 2 AVP

3. Fast Carrier Forces - TF 50 (Operating from Bases at Pearl Harbor (2000 miles) and Espiritu (1200 miles)

Interceptor Group	- 50.1 -	2 CV, 1 CVL, 1 BB, 6 DD Aircraft - 108 VF, 116 VB/T
Northern Group	- 50.2 -	1 CV, 2 CVL, 3 BB, 6 DD Aircraft - 85 VF, 56 VB/T
Southern Group	- 50.3 -	2 CV, 1 CVL, 3 CA, 5 DD Aircraft - 92 VF, 114 VB/T
Relief Group	- 50.4 -	1 CV, 1 CVL, 2 CL, 4 DD Aircraft - 61 VF, 52 VB/T
Total		6 CV, 5 CVL, 4 BB, 3 CA, 2 CD, 21 DD Aircraft - 346 VF, 338 VB/T

B. Japanese Forces

1. Aircraft

The exact number of aircraft present is difficult to establish. U.S. Intelligence estimates for 1 November 1943 show 96 VB, 72 VF, 34 Float Planes, and 4 Flying Boats, total [illegible] Marshalls, Gilberts, and Wake.

A Japanese report to USSBS shows 3 seaplanes in the Gilberts, 30 VF, 9 seaplanes, and 60 unspecified types in the Marshalls, and 6 at Nauru for a total of 108. The same report shows 36 attack planes flown in from 24-26 November.

2. Submarines

18 SS of SubRon 1, operating out of Truk 1200 miles distant.

3. AA Defenses

(on 2 of the 3 islands attacked)

	3" and over	over 20mm to 3"
Bititu Is. (Tarawa)	6 guns	17 guns and 4 twin mounts
Bitaritari Is. (Makin)	3 guns	10 guns

II. General Account of Action

The occupation of the Gilberts began with amphibious landings on Makin and Tarawa Atolls on 20 November 1943. Central Pacific Forces, under Spruance, carried out the operation. In spite of stiff enemy opposition, all organized resistance was overcome on Makin by 22 November, and on Tarawa by the 23rd. Apamama was occupied with negligible opposition. Garrison and service units came ashore as soon as resistance ceased.

Enemy Air and Submarine Support During Operation.--Japanese support of garrison forces in the Gilberts was given by submarines and such aircraft as were left operational at bases in the Marshalls and Nauru. Intelligence indicated that submarine strength was being concentrated in the Tarawa area about 23 November. There were also indications of large scale air attacks to be staged through Mili or Taroa in the Marshalls.

Actually no damage was inflicted on our southern forces by submarine. Surface forces at Tarawa received no damage by air attack, but the Independence (CVL) was damaged by an aerial torpedo on 20 November. Although on D-day numerous sightings of submarines were reported, it was not until later that a number of sound contacts gave evidence of enemy submarines in the vicinity. Two of these were sunk, one by a destroyer of the carrier force.

Reports of unidentified planes and the appearance of enemy planes caused the transports to leave unloading areas on several occasions, but no serious interruptions took place. Nightly attacks by small groups of enemy planes were concentrated almost entirely on Bititu Island and did not molest shipping. The first, of about 8 planes, took place at 0400, 21 November. A second developed the next night with about 4 planes. Further attacks with one or two planes were made the following nights between 0200 and 0400.

The occupation was accompanied by large scale air operations by land and carrier planes.

Land-Based Air.--Commander Aircraft, Central Pacific (TF 57) was responsible for photographic reconnaissance, long range search, attacks on enemy bases within range to the west and fighter protection for our bases in the Samoan, Ellice, and Phoenix Islands, and Baker Island. Between 13 and 20 November, these forces, in nightly attacks, sent 66 VB(H) planes against the Gilberts, and about 90 against the Marshalls and Nauru.

Carrier Air.--Commencing Dog-2 Day, the carrier force was to establish and maintain air superiority, destroy or neutralize enemy defense, support the assault, conduct searches ahead of assault forces, provide fighter protection, maintain ASP, spot [illegible] objective.

50.1 Interceptor Group.--Operated north of Makin to intercept enemy attacks from the Marshalls. It maintained a 4 plane ASP during daylight, increasing to 6 planes on 21 November. While on station, a 24 fighter plane CAP was flown from dawn to dusk. Between 20-24 November, the area 300-010° T was searched daily to 200 miles.

19 Nov.--Made 10 attacks, 1 against Jaluit, and 9 against Mili, dropping 130 tons of bombs (Tons dropped in this account total 680 as compared to 603 in tabulation of daily action), destroying 7 enemy planes and damaging 3 AK, power station, hangars, and other installations. Runways at Mili were rendered unserviceable.
20 Nov.--3 targets attacked. At Makin, 16 tons were dropped in support of landings. At Jaluit, 6 tons of bombs destroyed a number of planes, and sank one AK previously damaged. An attack on Mili with 23 tons kept the runway out of use. One Betty was shot down east of Mili.
Night of 20-21 Nov.--3 groups of 4-8 enemy planes tracked by radar to the south. Next morning, Cowpens (CVL) sighted a submarine but contact was not developed.
22 Nov.--36 tons dropped on Mili runway then under repair.
23 Nov.--Moved north of, and maintained an 8 plane CAP, over Makin. About 1015, bogies were picked up by radar 90 miles north. Twelve CAP fighters were vectored out and intercepted about 20 Zekes and Hamps with belly tanks, 40-50 miles from the force. Our fighters, with a 4,000 foot altitude advantage, shot down 17 and lost 1 F6F.
24 Nov.--Bogies contacted by radar 103 miles to northwest. Half of the 24 plane CAP vectored out, intercepted 2 Bettys and 15-20 Zekes 55 miles from force. With our planes between two layers of enemy planes, fighters shot down 2 Bettys and 10 fighters, losing 1 of their own.
25-27 Nov.--Fueling, replacing aircraft, and resting pilots.

50.2 Northern Group.--Operated around Makin to gain and maintain control of the air over Makin and provide direct support to assault force.

19 Nov.--North of Makin, made attacks on Butaritari Is. and dropped 95 tons.
One Mavis was sighted and downed by fighters 23 miles from the force.
20 Nov.--Dropped 58 tons in two attacks, one in direct support of landings. Fighters destroyed 1 Betty.
21 Nov.--Provided CAP and ASP and made bombing and strafing attacks in support of ground forces. Six tons of bombs dropped. CAP shot down 1 Betty 20 miles from the force.
22 Nov.--Routine patrols. Six tons of bombs dropped in support.
23 Nov.--Fueled.
24 Nov.--Launched 2 night fighter groups (1 TBF and 2 F6F each) to intercept enemy planes to the south without success.
25 Nov.--Routine operations. Shadowed at dusk by a snooper which stayed at 30-40,000 yards for an hour. About 1911, 10-12 more snoopers appeared, split into 3 groups, 2 of which joined together but made no attempt to attack. The third group closed the force and 1 and possibly 2 were shot down. At 2008 all retired without inflicting damage.
At 2047, the Radford attacked and sank a submarine - the I-19.
26 Nov.--Routine patrols. Fighters shot down 1 Betty. About 1800, a night fighter group was launched to intercept bogies. The torpedo plane using radar shot down 2 Bettys. One fighter was lost. About 1900, there began an hour of torpedo attacks. Of 20-30 planes estimated present, there were 10 attacks by 1 or 2 planes from all directions. No damage was inflicted on the force. 7 planes believed shot down - 5 by ships' fire.

50.3 Southern Group.--Operated generally in area around Apamama.

18 Nov.--Attacked Bititu Island with 115 tons. Fighters shot down a float plane 35 miles from force. One Betty was probably shot down by ships fire. Two groups of 10-15 enemy planes each were detected in the distance but did not close the force.

19 Nov.--Attacked Bititu Island with 69 tons of bombs in coordination with CruDiv 5 bombardment. CAP shot down 3 Bettys.
20 Nov.--Bombed Bititu with 85 tons in support of landings. Fighters shot down 2 Bettys. At 1626 and again at 1650, Essex and Independence sighted a submarine. Destroyer investigated with negative results. About 1800, a group of 16-18 Betty torpedo bombers approached the formation, then about 30 miles west of Bititu. The planes came in low and were not picked up by radar until seen visually. The carrier group was in cruising disposition 5-L. All ships opened fire and fighters attacked. About 9 planes broke through, and split into 3 groups of 3 each. Two groups attacked Independence and one the Essex and Bunker Hill. The latter group was all shot down and inflicted no damage. Independence sighted 5 torpedoes, one of which hit at 1807 on the starboard quarter at Frame 103. The hit caused Independence to lose propulsion temporarily, but damage control was effective, and Independence proceeded to Funafuti escorted by Pensacola, Hale and Kidd. Eight of the attacking planes were downed by combined fighter and anti-aircraft action. At 1833, Independence sighted a submarine and Hale forced it down long enough for Independence to escape.

One probable reason for the success of the fighters in this attack was the policy of Commander Task Group 50.3 of launching 16 fighters at 1700 to provide air coverage, recovering this group just prior to dusk.

21 Nov.--Support of operations at Bititu, dropping 11½ tons. Pensacola, Hale, and Kidd rejoined.
22-23 Nov.--Provided called-for air support dropppng 10 to 6 tons respectively.
24 Nov.--Fueled.
25 Nov.--Air support was furnished as requested.

50.4 Relief Group.--Assigned neutralization of Nauru.

18 Nov.--Enroute.
19 Nov.--About 0300, while 152 miles southwest, launched 18 TBF's, for a pre-sunrise attack on Nauru runways. This was followed at 0620 by 20 F6F's which strafed AA positions. Attacks by dive bombers, torpedo bombers, and fighters were made at daylight, mid-morning and early afternoon. 90 tons were dropped.
20 Nov.--Retired to the southeast and fueled.
22-23 Nov.--Provided air cover for ships carrying garrison troops.
24-25 Nov.--125 miles to southeast of Tarawa as a relief group.
26-27 Nov.--Entire carrier force fueled, took on replacement aircraft, and reorganized for future operations, particularly the attack against the Marshalls scheduled for 4 December.

Note: From CinCPac Summary of Operations in Pacific Ocean Areas, November 1943 - Confidential.

OFFENSIVE ACTION BY FAST CARRIER FORCES AGAINST THE GILBERT ISLANDS

15 - 24 November 1943

				-- SORTIES --				---------- OWN AIRCRAFT ----------						---- ENEMY AIRCRAFT ----				
														Engaged		Destroyed in Air		
Date	Target	Task Desi...	Type A/C	Total	Attacking Target	Tons Bombs	Rockets	Engaging En. A/C	Dest. by En. A/C	Encountered AA	Character of AA	Dest. by AA	Op. Loss	VF	VB/T	VF	VB/T	Ground
18 Nov	Airfields	50.2,3	VF	45	41					41								3
			VB/T	34	32	27				32								
	Mil. Install.	50.3	VF	70	52	8		1		60				1		1		
			VB/T	108	101	50				76		1						
19 Nov	Airfields	50.1,3	VF	85	77			2		77		2	1		1			11
			VB/T	114	109	89		1		86			3		1			
	Mil. Instal.	50.1,2,3	VF	102	99			4		60			2	1		1		
			VB/T	255	230	155				179			2					
	Shipping	50.1,3	VF	8	2					2								
			VB/T	2	2	2				2								
20 Nov	Airfields	50..	VF	16	16					16		1						
			VB/T	43	43	22				43								
	Mil. Install.	50.1,2,3	VF	120	109					54		1						
			VB/T	224	215	141				115		1	1					
	Harbor Areas	50.1,2	VF	17	17					17								
			VB/T	31	25	15		2		7					1		1	
21 Nov	Airfields	50.1	VF	8	1					1								1
	Mil. Install.	50.2,3	VF	24	24													
			VB/T	34	24	18												
	Harbor Areas	50.2	VF	12	12					12								
			VB/T	12	12	5												

				-- SORTIES --				---------- OWN AIRCRAFT ----------						---- ENEMY AIRCRAFT ----				
														Destroyed				
														Engaged		Air		
Date	Target	Task Desig.	Type A/C	Total	Attacking Target	Tons Bombs	Rockets	Engaging En. A/C	Dest. by En. A/C	Encoun-tered AA	Character of AA	Dest. by AA	Op. Loss	VF	VB/T	VF	VB/T	Ground
21 Nov	Shipping	50.3	VF	7	7					7								
			VB/T	20	20	8				20								
22 Nov	Airfields	50.1	VF	25	25					25		1	1					
			VB/T	41	39	31				36			3					
	Mil. Install.	50.1,3	VF	8														
			VB/T	68	67	31				21								
	Shipping	50.3	VF	8	4													
23 Nov	Mil. Install.	50.3	VB/T	12	12	6				6								
								TOTAL OFFENSIVE										
	Airfields	50.1,2,3	VF	179	160	0		2		160		4	2		1			15
			VB/T	232	223	169		1		197		0	6		1			0
	Mil. Install.	50.1,2,3	VF	324	284	8		5		174		1	2	2		2		
			VB/T	701	649	401		0		394		2	3	0		0		
	Harbor Areas	50.1,2	VF	29	29	0		0		29					0		0	
			VB/T	43	37	15		2		19					1		1	
	Shipping	50.1,3	VF	23	13	0				9								
			VB/T	22	22	10				22								
			VF	555	486	8		7		372		5	4	2	1	2	0	15
			VB/T	998	931	595		3		632		2	9	0	2	0	1	0

ENCLOSURE F

DEFENSIVE ACTION BY FAST CARRIER FORCES IN THE GILBERT ISLANDS

15-29 November 1943

				OWN AIRCRAFT					ENEMY AIRCRAFT								OWN SHIPS				
						Losses			Attacking				Engaged		Destroyed By A/C			By				
Date	Mission	Task Desig.	Type A/C	Sorties	Engaging En. A/C	A/C	AA	OP	VF	VB/T	Tactics	Ordnance	VF	VB/T	VF	VB/T	Gr.	AA	Unit Attacked	Sunk Type	Sunk No.	Damaged Type	Damaged No.
15 Nov	CAP Target	50.3	VF	14																			
	CAP Local	50.3	VF	10	2								1		1								
19 Nov	CAP Target	50.1	VF	30																			
	CAP Local	50.3	VF	32	12									4		4							
20 Nov	CAP Target	50.1	VF	27													11						
	CAP Local	50.1,2,3 (50.3)	VF (VF)	27 (8)	14 (8)					16-18		Torpedo		18 (16)		6 (4)		3	50.3	None		OVL	1
21 Nov	CAP Local	50.1,2	VF	16	6									2		2							
22 Nov	CAP Target	50.1,3	VF	32																			
23 Nov	CAP Local	50.1	VF	23	12			1	20		(Intercepted 90 mi. out)		22		17				50.1	None		None	
24 Nov	CAP Local	50.1	VF	20	12	1			15-20	2	(Intercepted 55 mi.out)		18	2	10	2			50.1	None		None	
26 Nov	CAP Local	50.2,3	VF	9	9					20-30		Torpedoes		4*		4		5	50.2	None		None	
29 Nov	CAP Local	50.3	VF	4	4	1								1		1							
									TOTAL DEFENSIVE														
	CAP Target		VF	109													11						
	CAP Local		VF	141	71	2		1					41	31	28	19							
				250	71	2		1					41	31	28	19	11						

* See also Night Action this date.

OFFENSIVE ACTION BY FAST CARRIER FORCES
AGAINST MAUKU, WOTJE, AND KWAJALEIN

19 November, 4 and 8 December 1943

Date	Target	Task Desig.	Type A/C	Sorties: Total	Sorties: Attacking Target	Tons Bombs	Rockets	Own Aircraft: Engaging En. A/C	Own Aircraft: Dest. by En. A/C	Own Aircraft: Encountered AA	Own Aircraft: Character of AA	Own Aircraft: Dest. by AA	Own Aircraft: Op. Loss	Enemy Aircraft Destroyed: Air Engaged VF	Air Engaged VB/T	Air VF	Air VB/T	Ground
								MAUKU										
19 Nov	Airfields	50.4	VF	58	49					49								2
			VB/T	110	108	64		1	1	108			1	3				
	Mil. Install.	50.4	VF	18	8			8		8				7		2		
8 Dec	Airfields	50.8	VF	31	22	10				29		1						6
			VB/T	87	87	48				87		2						
								WOTJE - KWAJALEIN										
4 Dec	Airfields	50.1,3	VF	104	60	12		36	3	67		1	1	68	3	28	2	31
			VB/T	33	33	26				33								
	Shipping	50.1,3	VF	1	1			1		1				3		1		
			VB/T	145	138	90		14		116		1		21	6	7	1	
								TOTAL OFFENSIVE										
	Airfields		VF	193	131	22		36	3	145		2	1	68	3	28	2	39
			VB/T	230	228	138		1	1	228		2	1	3				
	Mil. Install.		VF	18	8			8		8				7		2		
	Shipping		VF	1	1			1		1				3		1		
			VB/T	145	138	90		14		116		1		21	6	7	1	
			VF	212	140	22		45	3	154		2	1	78	3	31	2	39
			VB/T	375	366	228		15	1	346		3	1	24	6	7	1	0

DEFENSIVE ACTION BY FAST CARRIER FORCES
AT MAURU, WOTJE, AND KWAJALEIN

5 and 6 December 1943

			OWN AIRCRAFT						ENEMY AIRCRAFT								OWN SHIPS				
							Losses							Destroyed							
Date	Mission	Task Desig.	Type A/C	Sorties	Engaging En. A/C	A/C	AA	OP	Attacking VF	VB/T	Tactics	Ordnance	Engaged VF	VB/T	By A/C VF	VB/T	Gr.	By AA	Unit Attacked	Sunk Type	No.	Damaged Type	No.
									MAURU														
5 Dec	CAP Local	50.8	VF	4	1									1		1							
									WOTJE-KWAJALEIN														
6 Dec	CAP Local	50.1	VF	12	4									1		1							
									TOTAL DEFENSIVE														
			VF	16	5									2		2							

TOTAL AIR ACTION BY FAST CARRIER FORCES

IN GILBERT ISLANDS CAMPAIGN

18-29 November and 4, 5 and 8 December 1943

Date	Target	Task Desig.	Type A/C	-- SORTIES -- Total	Attacking Target	Tons Bombs	Rockets	OWN AIRCRAFT Engaging En. A/C	Dest. by En. A/C	Encountered AA	Character of AA	Dest. by AA	Op. Loss	ENEMY AIRCRAFT Engaged VF	VB/T	Destroyed Air VF	Air VB/T	Ground
OFFENSIVE																		
			VF	767	626	30		52	3	526		7	5	80	4	33	2	54
			VB/T	1,373	1,297	823		18	1	978		5	10	24	8	7	2	0
DEFENSIVE																		
			VF	266	106			76	2	88			1	41	33	28	21	11
NIGHT ACTION																		
19 Nov	Airfield	50.1	VF	24	24	17				24					2			
26 Nov	CAP Local	50.2	VF	2				2	1						2		2	
			VT	1				1										
TOTAL																		
			VF	1,035	734	30		130	6	614		7	6	121	39	61	23	65
			VB/T	1,398	1,321	840		19	1	1,002		5	10	24	10	7	4	0

FAST CARRIER FORCES AGAINST TRUK

16 - 17 February 1944

I. Forces Engaged

A. United States Forces

1. Fast Carrier Forces - Task Force 58, operating from Majuro (1200 miles) and Pearl Harbor (3100 miles)

Task Group 58.1 - 2 CV, 1 CVL, 3 CL, 1 CLAA, 9 DD
Aircraft - 103 VF, 113 VB/T

Task Group 58.2 - 2 CV, 1 CVL, 3 CA, 1 CLAA, 8 DD
Aircraft - 105 VF, 115 VB/T

Task Group 58.3 - 1 CV, 2 CVL, 6 BB, 2 CA, 11 DD
Aircraft - 87 VF, 70 VB/T

2. Battleships, Cruiser and Destroyer Sweep Force

Task Group 50.0 - 2 BB, 2 CA, 4 DD from T.G. 58.3

B. Japanese Forces

1. Aircraft - In addition to planes based on Truk Atoll, U.S. forces were exposed to enemy aircraft from Tinian, and possibly from Wake, Namoi, and Ponape. U.S. Intelligence placed minimum air strength on Truk as 75 VF, 28 VSB, 12 VT, 12 VBM, 5 VPL, and 58 float planes, a total of 190. An estimated 315 enemy aircraft were observed at Truk on 16 February. This figure is close to the postwar estimate of 365 aircraft of all kinds made by Rear Admiral Sumikawa, who was at Truk during the February raid.

2. Submarines - Photographic observations made 3 February showed 12 SS then present at Truk. No submarines were located during the D-1 day attack and no contacts were made by the Task Force.

3. AA and Coastal Defenses - The Japanese had protected airfields on Eten, Param, and Moen Islands, with sea-plane bases on Moen and Dublon, 4 radio stations and 2 R. D. F. stations. The islands had 23-25 coastal defense guns up to 8 inch caliber, 17-20 dual purpose guns, 6 heavy anti-aircraft batteries, and 9-16 medium anti-aircraft batteries, together with additional armament.

II. General Account of Action

The major objective of Central Pacific actions during January and February 1944 was the capture and development of bases in the Marshall Islands. The seizure of Majuro, Kwajalein, and Eniwetok atolls marked the first capture by Central Pacific forces of territory controlled by Japan prior to World War II. Central Pacific actions also gave important assistance to the South Pacific campaign. The air attack made on Truk 16-17 February threatened the inner perimeter of the enemy's defenses and temporarily knocked out a major sea-air base. The Japanese considered Truk their pivotal position for defense of the mandated islands and their primary base for all South and Central Pacific operations. It functioned both as a key supply depot and a staging point for aircraft bound from the Empire to the South and Central Pacific. As a naval base it had excellent natural defenses and was considered the best anchorage in the mandated islands. Following the February attack, Japanese air opposition to South Pacific forces at Rabaul ceased abruptly.

The heavy raid on Truk followed two weeks after air reconnaissance had shown the presence of substantial fleet, air and merchant units. Fleet units observed 3 February by 2 FB4Ys from VMD-254 consisted of 1 BB (new Yamato class), 2 CV (or CVL), 8 CA, 4 CL, 20 LD, and 12 SS, plus various tenders and auxiliaries, and numerous transports, oilers and freighters. Truk also had been absorbing aircraft and flight personnel from fields abandoned by the Japanese. Before the close of November 1943, the Mille island contingent of "Vals" was removed to Truk and Rabaul and the subsequent February all remaining flight personnel went to Truk. About 1 February, all pilots on Maloelap had been transferred there. Truk also appeared a probable origin for the effective seaplane raid staged against Roi on 12 February.

The Truk raid was timed as a strong supporting operation for two amphibious assaults, on the Green Islands in the South Pacific, staged 15 February, and on Eniwetok, westernmost atoll of the Marshall group, 17 February. Task Force 58 sortied from Majuro 12 February, and refueled at sea the 14th. During fueling, a VF from Bellboy Wood shot down a radar detected "Betty," probably before [illegible] presence of the formation. No further contacts were made during the approach, and the carriers reached their launching point at 0650, 16 February.

The attack plan called for air supremacy over the target by destruction of the enemy air force. A fighter sweep of 70 planes attacked at dawn, dividing their efforts between airborne enemy aircraft, and strafing airfields and seaplane bases. The sweep claimed destruction of 128 planes, 72 grounded and 56 in the air (51 of these fighters). The enemy had as many as 80 planes airborne during the attack. Anti-aircraft fire during this and later strikes on Truk varied from moderate to intense. Immediately following the fighter strike, 18 torpedo bombers dropped fragmen-

seaplane base. This attack made fields and installations generally unserviceable and sharply reduced night attacks on the carrier forces. Only 7 enemy planes attacked U.S. ships during the night of 16-17 February.

The primary target following the fighter strikes was shipping. Forewarned by the PB4Y reconnaissance of 3 February, the enemy had evacuated most of his fleet units. There remained, however, enough merchant shipping to provide carrier aircraft with the record for World War II -- 192,000 gross tons of merchantmen sunk in one day. An additional 12,000 standard tons of combatant ships also went down under air missiles. Approximately 30 separate flights of 18 to 30 aircraft went in, containing torpedo planes, dive bombers, and escorting fighters. Torpedoes were employed sparingly--only 66 were expended. The usual attack load consisted of 500-pound bombs (498) and 1,000-pounds (369), with a few 250, 1,600, and 2,000-pound missiles being dropped.

Because the operation plan gave priority to enemy aircraft and shipping, attack on shore installations was deferred and finally, although shipping targets had been exhausted and airborne opposition had ceased, the task force withdrew without extensive attacks on shore installations. Relatively light damage included destruction of 1 or 2 hangers on Moen, 3 fuel tanks on Dublon and others on Eten, plus ammunition dumps on Dublon.

Claims of enemy aircraft destroyed totalled 211 of which 129 were airborne, 79 fighters and 50 other types. Approximately 70 grounded planes were damaged and probably made unserviceable. U.S. plane losses from all causes were 4 aircraft.

Very early on 18 February, during the task force retirement toward the fueling rendezvous, Intrepid (CV) was struck on the starboard quarter by an air torpedo. A number of after compartments ruptured and flooded, the rudder jammed, and 2 planes and a 20-MG platform went overboard. Personnel losses were 6 men killed, 5 missing, and 17 injured.

TOTAL AIR ACTION BY FAST CARRIER FORCES AGAINST TRUK

16 - 17 February 1944

Date	Target	Task Desig.	Type A/C	-- SORTIES -- Total	Attacking Target	Tons Bombs	Rockets	OWN AIRCRAFT: Engaging En. A/C	Dest. by En. A/C	Encountered AA	Character of AA	Dest. by AA	Op. Loss	ENEMY AIRCRAFT Destroyed: Engaged VF	Engaged VB/T	Air VF	Air VB/T	Ground
								OFFENSIVE										
16 Feb.	Shipping	58.1, ',3	VF	236	173			37				2	2	33	3	22	2	
			VB/T	410	449	274		15	2			2	3	19		2		
	Land	58.1, ',3	VF	143	246	4		38	1			3		75	5	38	5	
			VB/T	108	112	59							2					
	Search & Misc.	58.1, ,3	VF	12				5						9		2		
17 Feb.	Shipping	58.1, ',3	VF	76	55													
			VB/T	144	132	73						3	1					
	Land	58.1, ³	VF	47	47													
								TOTAL OFFENSIVE										
	Shipping		VF	312	228			37				2	2	33	3	22	2	
			VB/T	554	581	347		15	2			5	4	19		2		
	Land		VF	190	293	4		38	1			3		75	5	38	5	
			VB/T	108	112	59							2					
	Search & Misc.		VF	12				5						9		2		
	Total		VF	514	521	4		80	1			5	2	117	8	62	7	
			VB/T	662	693	406		15	2			5	6	19		2		
								DEFENSIVE										
16 Feb.	CAP	58.1,2,3	VF	43				17						2	9	2	6	
17 Feb.	CAP	58.3	VF	4				3							1		1	
								TOTAL DEFENSIVE										
			VF	47				20						2	10	2	7	

FAST CARRIER FORCE RAID ON WESTERN CAROLINES

30 March - 1 April 1944

I. Forces Employed

A. United States Forces

1. Fast Carrier Forces - Task Force 58 - Operating from bases at Majuro (2200 miles), Espiritu Santo (2400 miles), and Pearl Harbor (4100 miles).

Carrier Task Group 58.1 - 1 CV, 2 CVL, 3 CL, 1 CLAA, 17 DD
Aircraft - 87 VF, 68 VB/T

Carrier Task Group 58.2 - 2 CV, 2 CVL, 2 BB, 6 CA, 15 DD
Aircraft - 126 VF, 122 VB/T

Carrier Task Group 58.3 - 2 CV, 2 CVL, 4 BB, 4 CA,
1 CLAA, 16 DD
Aircraft - 130 VF, 124 VB/T

2. Shore-based Air.--Southwest Pacific Air Forces, operating from the Admiralty Islands (400 miles) began attacks on Hollandia airfield 28 March, where 264 aircraft had been photographed during a 25 March reconnaissance. Heavy attacks were made 30 and 31 March by 65 and 68 B-24s, with 185 kills claimed, 162 on the ground. These attacks protected carrier operations against Palau from any interference from New Guinea-based aircraft. Southwest and Central Pacific land-based planes, the latter operating chiefly from Majuro (1200 miles), Kwajalein (900 miles), and Tarawa (1300 miles) made day and night raids on Truk airfields 28-31 March. Southwest Pacific PB4Ys and PBY aircraft operating from Nadzab made three successive night attacks at the month's end on Woleai, approximately 600 miles east of Palau and 900 miles from the base.

B. Japanese Forces

1. Aircraft - Air strength in the Carolines was estimated at 500-600 aircraft, based principally at Truk and Palau, with approximately 150-170 at Palau. Rapid enemy reinforcement could be made from all Carolines bases, and possibly could come from the Marianas, New Guinea, and the Dutch East Indies. Substantial reinforcements were flown in the night of 30 March.

On 26 March Palau had only one effective airfield; other [illegible] but not yet operational. The principal airbase was on Peleliu Island, the southern member of the Palau group.

2. Submarines - The SS squadron formerly based at Truk apparently did not move to Palau with the Second Fleet and CinC Combined Fleet. Task Force 58 made no contacts with enemy submarines during these Western Carolines operations.

3. AA Defenses - No data. Anti-aircraft fire varied from slight to intense.

II. General Account of Action

The heavy carrier attack made on Truk, 16-17 February, caused the Japanese to move a number of important fleet units to Palau. The enemy forces at Palau formed a threat to scheduled operations by Southwest Pacific forces in northern New Guinea. The attack on Palau was designed to destroy the air forces, the combatant and merchant shipping found there, and to further immobilize the base by mining entrance channels. Concurrent attacks were made on neighboring bases at Yap, Ulithi, and Woleai. The 30-31 March attacks on Palau marked two important firsts in naval aviation: the first use of carrier fighters to attack enemy shipping, and the first minelaying by aircraft from carriers.

Fast carrier forces from Majuro sortied 23 March and rendezvoused with forces from the South Pacific on the 26th and 27th. Enemy search planes sighted the fleet first on the 25th and again on the 28th of March. The day following, the submarine Tunny reported a 16-20 ship convoy, with 1 BB, 1 CL and 2 DD, had left Palau. The task force reached a launching point 90 miles south of the Palau Islands on 0630, 30 March.

Dawn fighter sweeps quickly destroyed virtually all airborne aircraft. Strafing attacks on the Peleliu airfield and the two seaplane bases likewise destroyed a substantial number of grounded planes. Enemy air opposition, however, did not end the first day. Substantial reinforcements were flown in during the night, and the number of enemy planes airborne rose from 55 of the preceeding morning to 60. Enemy aircraft shot down by the second day's sweep reached 53, more than double the 22 planes previously encountered.

The first day's fighter sweep knocked out some 31 grounded aircraft. Subsequent bombarding and strafing attacks took an additional 28, leaving few serviceable planes. Throughout the day, 70 bombs varying from 500 to 2000 pounds were dropped on airfields. Delayed fuses were employed to handicap further enemy use of the fields, but the effort to make airfields inoperative failed.

On 31 March, 115 sorties bombed and strafed the airfield and seaplane bases on Palau. These attacks destroyed an additional 35 enemy planes, bringing the total claimed to 94.

Shipping was the major target. Anti-shipping sorties totalled 453, and 220 tons of bombs were dropped, sinking 3 destroyers, 2 large, 6 medium, and 9 small freighters; 3 large, 1 medium and 1 small oiler together with three smaller ships. Some 17 other vessels were severely damaged, many of them beached and burning.

The mining operation was carried out by [illegible] carriers. Torpedo planes with fighter escort from the Lexington, Bunker Hill, and Hornet carried out the first phase of the operations. Lexington squadrons approached the main channel shortly after dawn, when several Japanese ships were in the channel or approaching it on the way out. Strafing fighter planes drove all but one or two of the ships back into the lagoon. Sixteen mines were laid and the main channel closed. Two secondary channels were mined successfully despite fighter opposition and severe anti-aircraft fire. Less fighter interception occurred during the second phase, and 10 mine fields were laid as planned. The 78 mines dropped were so placed to make sweeping difficult.

Attacks were made on ground installations when shipping targets could not be found. More than 40 buildings were destroyed at Arakabesan Island, and hangers and small buildings badly gutted at its southern seaplane base. Fuel storage, wharfage facilities, and some 20 warehouses were damaged badly on Malakal Island. At Koror 17 hangars, three fuel dumps, warehouses and other buildings were severely damaged and destroyed.

On 31 March, Task Group 58.1 flew 142 sorties over Yap and Ulithi, damaging radio stations and other structures. Task Force 58 then rendezvoused off Woleai and launched air attacks throughout the morning. Retirement began at 1430. The Woleai runway was cratered, the radio and meteorological station, various barracks, and other buildings, 7 grounded aircraft and 3 landing barges were destroyed. Approximately 450 sorties dropped 150 tons of bombs.

The attack on Palau marked the deepest penetration of enemy defenses yet made by fast carrier forces. Despite enemy knowledge of its location from 28 March to 3 April, air attacks on the task force were less severe than attacks made in February off the Marianas. Only one plane got through to injure several men by strafing.

Enemy losses totalled 160 aircraft destroyed, and 29 probables. Ships sunk reched 29, with 18 damaged, U.S. aircraft losses were 43, with 25 lost in combat and 18 operationally. Aviation personnel killed totalled 26.

FAST CARRIER FORCE RAID ON WESTERN CAROLINES
OFFENSIVE ACTION
30 March - 1 April 1944

Date	Target	Task Desig.	Type A/C	Sorties — Total	Sorties — Attacking Target	Sorties — Tons Bombs	Sorties — Rockets	Own Aircraft — Engaging En. A/C	Own Aircraft — Dest. by En. A/C	Own Aircraft — Encountered AA	Own Aircraft — Dest. by AA	Own Aircraft — Op. Loss	Enemy Aircraft — Engaged — VF	Enemy Aircraft — Engaged — VB/T	Enemy Aircraft — Destroyed Air — VF	Enemy Aircraft — Destroyed Air — VB/T	Enemy Aircraft — Destroyed Ground
30 March	Fighter Sweep	58,1,2,	VF	76	72			25	1		2		58	1	19	1	
	Shipping	58.1,2,	VF	368	505	4		2			3	1	2		2		
			VB/T	434	551	256	119	3			7	5		2		1	
	Mine Laying	58.2,3	VF	23	33			6	1				9		2		
			VB/T	28	53	60		2					2		1		
31 March	Fighter Sweep	58.1,2,	VF	63	12			44	1				89	2	41	13	
	Shipping	58.1,2,3	VF	153	138	7		14			2		7		6		
			VB/T	201	250	97		4			4	1	5		1		
	Land	58.1,3	VF	70	65	4											
			VB/T	69	41	24											
	Mine Laying	58.2	VF	8	4												
			VB/T	6	12	6	12										
1 April	Fighter Sweep	58.1,2,	VF	75	49						1	1					
	Land	58.1,2,3	VF	153	134							1					
			VB/T	211	190	101	72				2	2					
TOTAL OFFENSIVE ACTION																	
	Fighter Sweep		VF	214	133			69	2		3	1	147	3	60	14	
	Shipping		VF	521	643	11		16			5	1	9		8		
			VB/T	635	801	353	119	7			11	6		2	1	1	
	Land		VF	223	198	4						1					
			VB/T	280	231	125	72				2	2					
	Mine Laying		VF	31	37			6	1				9		2		
			VB/T	34	65	66	12	2					2		1		
	Total		VF	989	1,011	15		91	3		8	3	165	3	70	14	
			VB/T	949	1,097	544	203	9			13	8	2	2	2	1	

ENCLOSURE F

FAST CARRIER FORCE RAID ON WESTERN CAROLINES
DEFENSIVE ACTION

20 March - 1 April 1944

Date	Mission	Task Desig.	Type A/C	Sorties	OWN AIRCRAFT - Engaging En. A/C	OWN AIRCRAFT - Losses A/C	AA	OP	ENEMY AIRCRAFT - Engaged VF	Engaged VB/T	Dest. by A/C VF	Dest. by A/C VB/T
29 March	CAP	58.2,3	VF	16	6					2		2
	Convoy escort	58.3	VB/T	6	2					1		
30 March	CAP	58.2,3	VF	30	9			1	3	10	2	10
			VB/T	2	1					1		
31 March	CAP	58.1,2,3	VF	37	11					4		4
	Rescue	58.2	VF	4								
1 April	CAP	58.2	VF	8	4					1		1
TOTAL DEFENSIVE												
			VF	95	30			1	3	17	2	17
			VB/T	8	3					2		

FAST CARRIER FORCES IN THE OCCUPATION OF THE MARIANAS

11 - 20 June 1944

I. U.S. Forces Engaged

A. U.S. Forces

1. Fast Carrier Force

T.G. 58.1 - 2 CV, 2 CVL, 3 CA, 3 CL, 14 DD
Aircraft - 132 VF, 120 VB/T

T.G. 58.2 - 2 CV, 2 CVL, 2 BB, 3 CL, 16 DD
Aircraft - 129 VF, 119 VB/T

T.G. 58.3 - 2 CV, 2 CVL, 5 BB, 1 CA, 1 CL, 16 DD
Aircraft - 125 VF, 108 VB/T

T.G. 58.4 - 1 CV, 2 CVL, 4 CL; 14 DD
Aircraft - 97 VF, 68 VB/T

Total - 7 CV, 8 CVL, 7 BB, 4 CA, 11 CL, 60 DD
Aircraft - 483 VF, 415 VB/T

First strike launched 11 June, 200 miles from targets.

2. Joint Expeditionary Force

Vessels assigned - 7 BB, 6 CA, 5 CL, 11 CVE, 88 DD, 14 DE

13 ARD, 55 APA & AP, 22 AKA & AK, 1 APC 19 XAP & XAK, 91 LST, 8 LSD, 110 LCI, PC, SC, YMS, 6 AM,

18 AVD, AR, AN, AT, 10 DMS, 2 AGC

First vessels arrived in Marianas Area on 13 June; others followed daily through 19 June.

3. Shore Based Air -- Forward Area

Aircraft assigned -	VF - 291	VBH - 132	VD - 19	VR - 49
	VF(N) 44	VBM - 112	VP - 72	VPR - 12
		VSB - 72	VSO - 48	
		VTB - 36		
	335	352	139	61

Nearest bases - Marshalls and Admiralties - 1000 mi. distant

B. Japanese Forces

1. Carrier Forces

Sortied from the Philippines on the 15th and engaged our carriers on the 19th and 20th. (See study "Carrier vs Carrier".)

2. Land Based Air

On 1 June 1944

a. Marianas - 310 VF, 240 VA, 20 VP - Total 570

Japanese report one half of these shifted to Biak 1 June. Aircraft from outlying areas including the homelands were staged into the Marianas particularly after the 16th.

b. Western Carolines - 35 VF, 130 VA, - Total 165

c. Bonins - 20 VF, 10 VA - Total 30

3. Submarines - No data.

II. General Account of Action

Fast carrier forces operated in support of the Marianas occupation from 11 June to 3 August. This support consisted of strikes for four days before the landing, direct support of the landing and inland advance, attacks on outlying islands to isolate the area, and defense of occupation forces against a strong enemy fleet attack.

This account is concerned only with the first 10 days of the action, 11-20 June, which includes preliminary strikes, support action, first of the isolation raids, and action against the enemy fleet. (Details of the fleet engagement are treated in the study "Carrier vs Carrier".)

The task force sortied from Majuro on 6 June, held training exercises on the 7th and 8th, fueled all but the heavy ships on the 9th, and on the next two days advanced behind a patrol of shore based PB4Y's. At about 1300 on the 11th while 200 miles east of the Marianas, all groups launched the initial strike of the campaign--a fighter sweep of over 200 planes--which reduced enemy air strength by about one-third.

That night a number of enemy planes approached but did not attack the force and next day the daily air bombardment of the islands began. Search planes discovered two convoys on the 12th, one 125 miles west of Pagan and the other 135 miles west of Guam. The first, of 20 vessels, was hit twice in bombing attacks and next day search planes found only one vessel, a few abandoned hulks, wreckage, and debris. The other, composed of 2 AK, 2 DD, and 2 DE, was not located by a strike on the 12th, but a fighter bomber attack next day left both destroyers trailing oil and one AK on fire.

On the 13th the fast battleships and destroyer screen separated from the carrier force for a day-long bombardment of Saipan. On the 14th, 58.1 and 58.4 fueled and then departed for the Bonins while the remaining groups continued strikes on Guam, Rota, Tinian and Saipan. Fire support ships of the assault force arrived and began their bombardment. And on the 15th, under cover of heavy surface and serial bombardment, troops made a successful landing on beaches of western Saipan.

Enemy air attacks on assault shipping totalled some 150 aircraft from 15 June to 7 July, but since they were made in raids of one to three aircraft each, were not a serious threat. Early raids appeared to originate on Guam, Rota, and Tinian while the later ones seemed to come from the Carolines. The first strong attack against the fast carrier force came the evening of the 15th against the two groups then operating about 40 miles west of Saipan. Unidentified planes approaching from Guam were picked up by radar and CAP interceptors shot down seven of them. Two night fighters were launched after sunset to intercept the enemy fighter cover and shot down one. The 8-10 twin engine bombers not intercepted attacked a few minutes later in a coordinated low level attack on T.G. 58.3. Torpedoes passed close to the Lexington and Enterprise but no hits were scored on our ships. Planes approached but did not attack T.G. 58.2.

On the 16th and 17th, there was evidence that the force was under observation by enemy sub and surface craft and several sampans were sunk. Air action on the 17th was considerably reduced while the force was being readied and reinforced for the coming fleet engagement.

Task Groups 58.1 and 4, approaching the Bonins on the 15th met unfavorable weather with winds of 25-30 knots and rough seas with long swells. In the afternoon fighter sweeps and fighter bomber strikes were launched against the islands in which 39 planes were shot down, and 25 destroyed on the ground and considerable destruction was wrought on barracks, hangars and runways. Although landings aboard were made under most unfavorable conditions, only one plane was lost operationally.

Attacks were repeated the next afternoon but strikes scheduled for the 17th were cancelled by recall to the Marianas. The four carrier groups joined up on the 18th and took position west of Saipan between the forces they were to protect and the advancing enemy fleet.

The force was not damaged by enemy attack during this period and effective control of the air was maintained in the area. The air effort was intense and continuous but, from the success achieved on the next two days, did not reduce the fighting effectiveness of the force.

OFFENSIVE ACTION BY FAST CARRIER FORCES
IN THE OCCUPATION OF THE MARIANAS
11 – 20 June 1944

Date	Target	Task Desig.	Type A/C	SORTIES: Total	Attacking Target	Tons Bombs	Rockets	Engaging En. A/C	Dest. by En. A/C	OWN AIRCRAFT: Encountered AA	Dest. by AA	Op. Loss	ENEMY AIRCRAFT* Destroyed: Engaged VF	Engaged VB/T	Air VF	Air VB/T	Ground
11 June	VF Sweep	58.1	VF	55	85	2					1		49		33		2
		58.2		56	89	3			1		3		39		21		19
		58.3		61	86	2			1		2		15	4	9	3	
		58.4		39	82	1			1		3		15	3	11	2	12
		Total		211	342	8			3		9		118	7	74	5	33
		58.1	VB/T	4	2								2				
		58.2		2										1		1	
		58.3		2	1												
		58.4		2													
		Total		10	3								2	1		1	
12 June	Land	58.1	VF	237	257	23					7	1	20	2	15	1	5
		58.2		165	169	12					1	1					3
		58.3		225	221						1	2	3	3	1	2	
		58.4		77	124						2	1					1
		Total		704	771	35					11	5	23	5	16	3	9
		58.1	VB/T	229	219	165	76				4	3	1				5
		58.2		247	257	137	80				3						
		58.3		240	240	144					2	1					2
		58.4		72	110	50	24				3						
		Total		788	817	496	180				12	4	1				7
	Shipping	58.1	VF	2	2												
		58.4		40	40	4					1						
		Total		42	42	4					1						
		58.1	VB/T	10	4												
		58.4		42	39	22	18					1					
		Total		52	43	22	18					1					
	Search & Misc.	58.2	VF	8										2		2	
											2						

(Continued)

				-----SORTIES-----				-OWN AIRCRAFT-					-ENEMY AIRCRAFT- Destroyed		
Date	Target	Task Desig.	Type A/C	Total	Attacking Target	Tons Bombs	Rockets	Engaging En. A/C	Dest. by En. A/C	Encountered AA	Dest. by AA	Op Loss	Engaged VF	Engaged VB/T	Air VF	Air VB/T	Ground
13 June	Land	58.1	VF	30	27	5					2						4
		58.2		82	81	2											
		58.3		144	153						1						
		58.4		168	182	16					3						2
		Total		424	443	23					6						6
		58.1	VB/T	56	48	38					1	1					
		58.2		44	46	39											1
		58.3		173	170	103	46				3						2
		58.4		186	186	135	28										
		Total		459	450	315	74				4	1					3
	Shipping	58.4	VF	68	78	6			1					3		2	
		58.2	VB T	45	20	4	20							1			
	Search & Misc.	58.2	VF	6													
		58.3		2													
		58.4		14										3		3	
		Total		22										3		3	
		58.3	VB/T	2													
14 June	Land	58.2	VF	195	229	1					1	1					
		58.3		16	19												
		Total		211	248	1					1	1					
		58.2	VB T	189	188	102	42				1	1					
		58.3		16	17	14											
		Total		205	205	116	42				1	1					
	Shipping	58.3	VF	8	10									1		1	
		58.3	VB/T	12	24	7											5

(Continued)

		--SORTIES--						----OWN AIRCRAFT----					---ENEMY AIRCRAFT---				
															Destroyed		
Date	Target	Task Desig.	Type A/C	Total	Attacking Target	Tons Bombs	Rockets	Engaging En. A/C	Dest by En. A/C	Encoun-tered AA	Dest. by AA	Op. Loss	Engaged VF	Engaged VB/T	Air VF	Air VB/T	Ground
15 June	Land	58.2	VF	101	130	1	79										
		58.3		173	177	6					1						3
		Total		274	307	7	79				1						3
		58.2	VB/T	112	136	76	16										
		58.3		181	179	106	8				1	1					1
		Total		293	315	182	24				1	1					1
	Search & Misc.	58.2	VF	4								1					
		58.3	VB/T	1													
16 June	Land	58.2	VF	60	66	12											
		58.3		92	137						3	1					13
		Total		152	203	12					3	1					13
		58.2	VB/T	63	70	37	16										
		58.3		117	103	63					2						13
		Total		180	173	100	16				2						13
17 June	Land	58.3	VF	47	48	1					1						
		58.3	VB/T	62	60	34	19				1						1
18 June	Land	58.4	VF	3	2									2		2	
		58.4	VB/T	3	1									1			
	Search & Misc.	58.2	VF	2										1		1	
		5882	VB/T	2													

(Continued)

				-- SORTIES --				---------- OWN AIRCRAFT ----------							-- ENEMY AIRCRAFT -- Destroyed		
Date	Target	Task Desig.	Type A/C	Total	Attacking Target	Tons Bombs	Rockets	Engaging En. A/C	Dest. by En. A/C	Encoun-tered AA	Dest. by AA	Op. Loss	Engaged VF	Engaged VB/T	Air VF	Air VB/T	Ground
19 June	Land	58.1	VF	47	28	1			1				4	16	1	13	3
		58.2		14	6												
		58.3		18	17								14	6	13	5	3
		58.4		8	8												1
		Total		87	59	1			1				18	22	14	18	7
		58.1	VB/T	87	92	43					4						6
		58.2		41	51	29					1	2		2		1	
		58.3		47	39	21					1		4		1		2
		58.4		12	10	4											
		Total		187	192	97					6	2	4	2	1	1	8
	Search & Misc.	58.1	VF	2							1	3	1	3			
		58.2		3					1					2		1	
		58.3		3					1				3	1	1	1	
		58.4		3									2	3	2	2	
		Total		11					2		1	3	6	9	3	4	
		58.1	VB/T	2													
		58.2		3					1					2		1	
		58.3		2									1				
		58.4		3									1	2		1	
		Total		10					1				2	4		2	
20 June	Land	58.4	VF	42	64	2			1				6	3	2	3	3
		58.1,2,3	VF	102	109	6			6			14	65	1	22		
			VB/T	137	198	108			5		6	65	85	2	4		
	Search & Misc.	58.1	VF	16									4	1	3	1	
		58.2		1									1		1		
		58.3		2									1	2	1	2	
		Total		19									6	3	5	3	
		58.1	VB/T	8									1		1		
		58.2		1									1				
		58.3		4										1		1	
		Total		13									2	1	1	1	

(Continued)

TOTAL OFFENSIVE

Date	Target	Task Desig.	Type A/C	Total	Attacking Target	Tons Bombs	Rockets	Engaging En. A/C	Dest. by En. A/C	Encountered AA	Dest. by AA	Op. Loss	Engaged VF	Engaged VB/T	Destroyed Air VF	Destroyed VB/T	Destroyed Ground
			--SORTIES--					**----------OWN AIRCRAFT----------**					**----ENEMY AIRCRAFT----**				
	Land		VF	2257	2596	96	79		11		32	21	230	40	128	31	74
			VB/T	2324	2414	1448	355		5		33	74	89	6	5	2	33
	Shipping		VF	118	130	10			1		1			4		3	
			VB/T	109	87	33	38					1		1			5
	Search & Misc.		VF	47					2		1	4	6	15	3	10	
			VB/T	15					1				2	4		2	
			VF	2422	2726	106	79		14		34	25	236	59	131	44	74
			VB/T	2448	2501	1481	393		6		33	75	91	11	5	4	38

DEFENSIVE ACTION BY FAST CARRIER FORCES
IN THE OCCUPATION OF THE MARRIANAS

11 - 20 June 1944

			- - - - - - - - -OWN AIRCRAFT- - - - - - - - -				- -ENEMY AIRCRAFT- -			
					Losses		Engaged		Destroyed	
Date	Task Desig.	A/C Type	Sorties	Engaging En. A/C	A/C	Op	VF	VB/T	VF	VB/T
11 June	58.1	VF	24	13				6		6
			4	4				2		1
	58.2		24	9			1	2	1	2
	Total		52	26			1	10	1	9
12 June	58.1	VF	4	2				1		1
	58.2		8	4				1		1
	58.3		4	4			1		1	
	Total		16	10			1	2	1	2
	58.4	VB/T	4	2						
13 June	58.3	VF	8	8						
	58.2	VB/T	4	4						
	58.3		4	2						
	Total		8	6						
14 June	58.1	VF	1	1				1		1
	58.1	VB/T	1							
	58.3		1	1						
	Total		2	1						
15 June	58.2	VF	8	1						
	58.3		14	12			10	9	7	1
	Total		22	13			10	9	7	1

(Continued)

			- - - - - - - -OWN AIRCRAFT- - - - - - - -				- -ENEMY AIRCRAFT- -			
					Losses		Engaged		Destroyed	
Date	Task Desig.	A/C Type	Sorties	Engaging En. A/C	A/C	Op.	VF	VB/T	VF	VB/T
16 June	58.4	VF	4	1				1		1
17 June	58.2	VF	1	1				1		1
	58.3		8					1		1
	Total		9	1				2		2
	58.2	VB/T	1	1				1		
18 June	58.2	VF	12	12				2		1
	58.3		12	2			1		1	
	58.4		8	4			1		1	
	Total		32	18			2	2	2	1
	58.2	VB/T	2	1						
	58.3		2	1			1		1	
	Total		4	2			1		1	
19 June	58.1	VF	114	71	3	2	128	13	72	13
	58.2		110	85	2	3	111	26	61	12
	58.3		103	73	3	1	61	65	37	43
	58.4		76	56	5	1	86	44	43	31
	Total		403	285	13	7	386	148	213	99
	58.1	VB/T	4	3			9	5	2	4
20 June	58.1	VF	1	1				1		1
	58.2		6	3				2		2
	Total		7	4				3		3
	58.1	VB/T	1	1				1		
			TOTAL DEFENSIVE							
		VF	538	357	13	7	339	176	223	117
		VB/T	24	16			10	7	3	4

OFFENSIVE AND DEFENSIVE ACTION BY FAST CARRIER FORCES AGAINST THE BONINS
16 - 16 June 1944

Date	Target	Task Desig.	Type A/C	-SORTIES- Total	Attacking Target	Tons Bombs	Rockets	-OWN AIRCRAFT- Engaging En. A/C	Dest. by En. A/C	Encountered AA	Dest. by AA	Op. Loss	-ENEMY AIRCRAFT- Destroyed Engaged VF	VB/T	Air VF	VB/T	Ground
								OFFENSIVE ACTION									
15 June	VF Sweep	58.4	VF	22	26			7			1		6		2		
	Land	58.1	VF	77	104			7				3	23		17		
		58.4		24	43			3				2	1	1	1		
		Total		101	147			10				5	24	1	18		
		58.1	VB/T	82	75	55					2	3					
		58.4		38	54	21					6	1					
		Total		120	129	76					8	4					
16 June	Land	58.1	VF	76	71												
		58.4		30	66						2						
		Total		106	137						2						
		58.1	VB/T	66	72	45					1	1					
		58.4		26	26	19											
		Total		92	98	64					1	1					
								TOTAL OFFENSIVE									
			VF	129	310			17			3	5	30	1	20		
			VB/T	212	227	140					9	5					
								DEFENSIVE ACTION									
15 June		58.1	VF	1				2						1	1		
		58.4	VB/T	4													
16 June		58.1	VF	3													
		58.4		4				2						1	1		
		Total		7				2						1	1		
								TOTAL DEFENSIVE									
			VF	14				4						2	2		
			VB/T	4													

FAST CARRIER OPERATION IN THE PHILIPPINES

9 - 24 September 1944

I. U.S. Forces Engaged

A. U.S. Carrier Forces

T.G. 38.1 - 2 CV, 2 CVL, 2 CA, 11 DD
Aircraft - 156 VF, 101 VB/T

T.G. 38.2 - 2 CV, 2 CVL, 2 BB, 3 CL, 18 DD
Aircraft - 128 VF, 112 VB/T

T.G. 38.3 - 2 CV, 2 CVL, 4 BB, 4 CL, 18 DD
Aircraft - 141 VF, 112 VB/T

T.G. 38.4 - Not included in this operation

Total - 6 CV, 6 CVL, 6 BB, 3 CA, 7 CL, 47 DD
Aircraft - 425 VF, 325 VB/T

B. Japanese Forces

1. Land Based Air (CinCPac estimate)

Mindanao	- no data
Central Philippines	- 200
Luzon	- 531

Aircraft on Luzon were principally around Manila at Clark, Nichols, and Nielson Fields of these types: 210 VF, 156 VB(SE), 144 VB(TE), 10 VS, 11 Float

2. Submarines - none. On 22 and 23 September, 5 subs were on station near latitude 15°N between 125° and 135°E longitude

II. General Account of Action

On 9 September after attacks on Palau, Task Force 38 began its support of Morotai landings by attacking Mindanao. Primary targets were aircraft airfields, and shipping. It was expected that considerable strength would be met and a maximum effort was planned against airfields from 9-14 September. The first day airfield attacks constituted three-fourths of the total effort but resistance did not materialize. When it was apparent that there were no profitable targets, the force burned Davao [illegible].

After fueling on the 11th, the central Philippines, believed the base for 200 aircraft, were struck the next two days. Cebu and Mactan were the principal targets the first day, but Tacloban field on Leyte was hit heavily and a few sweeps were made over Negros. On the 13th, the main activity was over northwest Negros but strikes on shipping continued. On the 14th, T.G. 38.1 withdrew to support Morotai landings with strikes on Mindanao. On the same day the remaining groups hit Negros and Pansy and then retired to relieve 38.4 at Palau on the 17th.

A direct result of these strikes was a change in Pacific war plans. Noting the enemy's weakness, ComThird Fleet recommended an early invasion of the central Philippines. When this reached the Joint Chiefs of Staff their decision was to cancel Yap landings and to discard the plan to invade the Philippines through Mindanao. The revised plans moved up the invasion date at least one month.

Groups 38.1, 2, and 3 then rejoined to launch attacks on Luzon on 21st and 22nd after which reports of an approaching typhoon forced retirement. This attack, not included in the original plan, exploited the favorable conditions found elsewhere in the islands. From a point about 70 miles east of central Luzon, heavy strikes were launched against fields around Manila against moderately heavy air opposition. Heavy attacks were also launched against shipping in Manila Harbor, Subic Bay, and Lingayon Gulf.

After refueling, the force ran south to launch strikes against the Visayas on the 24th. The primary target was shipping, particularly at Coron Bay, but sweeps over airfields were also made. The launching point was 350 miles from Coron Bay, but the extreme range caused no operational losses.

These attacks effectively stopped Japanese reinforcement from the Philippines to their forces opposing our landings at Palau and Morotai. Ships of the fast carrier force were not damaged by enemy attack in this operation.

Enemy planes destroyed on the ground in these attacks were reported by ComAirPac as 53 for 9-10 September, 221 for 12-14 September, 188 for 21-22 September, for a total of 462. Shipping destroyed (verified in JANAC) amounted to 11 combatant ships totalling 17,400 tons and 54 merchant vessels totalling 204,000 tons. In addition numerous small craft were sunk.

OFFENSIVE ACTION BY FAST CARRIER FORCES IN THE OCCUPATION OF THE PHILIPPINES

9 - 24 September 1944

Date	Target	Task Desig.	Type A/C	--SORTIES-- Total	Attacking Target	Tons Bombs	Rockets	OWN AIRCRAFT: Engaging En. A/C	Dest. by En. A/C	Encountered AA	Dest. by AA	Op. Loss	Engaged VF	Engaged VB/T	ENEMY AIRCRAFT DESTROYED: Air VF	Air VB/T	Ground
9 Sept.	VF Sweep	38.1,2,3	VF	48	78			6				1	1	2	1	2	
	Land	38.1,2,3	VF	131	130	6	40	4					1		1		
			VB/T	169	213	105	8										
	Shipping	38.1,2	VF	32	32												
			VB/T	57	65	44											
	General	38.1,2,3	VF	217	213	10	18	14					2	2	2	2	
			VB/T	259	248	169	32				2	1					
10 Sept.	VF Sweep	38.1,3	VF	59	60			14			2	2	1		1		
	Land	38.1,2,3	VF	108	87	5		3					2		2		
			VB/T	105	90	69	19					1					
	General	38.1,2,3	VF	89	107	6	42										
			VB/T	122	110	84	16					1					
12 Sept.	VF Sweep	38.2,3	VF	24	24								18		12		
	Land	38.2	VF	41	39	3											
			VB/T	79	111	55	53										
	Shipping	38.1,2	VF	80	98	9	30						6		3		
			VB/T	77	74	47						2					
	General	38.1,2,3	VF	342	273	11	90				1	2	82	2	47	1	
			VB/T	257	270	135	56	1			3	1	49		3		
	Search & Misc.	38.2	VF	2										1		1	

					SORTIES				OWN AIRCRAFT						ENEMY AIRCRAFT				
															Destroyed				
Date	Target	Task Desig.	Type A/C	Total	Attacking Target	Tons Bombs	Rockets	Engaging En. A/C	Dest. by En. A/C	Encountered AA	Dest. by AA	Op. Loss	Engaged VF	Engaged VB/T	Air VF	Air VB/T	Ground
13 Sept.	VF Sweep	38.1,3	VF	40	21			1					35	2	20	2	
	Land	38.1,2,3	VF	322	316	6	225	3			3	1	136		55		
			VB/T	330	343	204					3	3	17		1		
	General	38.1,2,3	VF	88	85	3	66						14		10		
			VB/T	119	134	64					1	2	7				
	Search & Misc.	38.2	VF	6										2		2	
14 Sept.	VF Sweep	38.2,3	VF	57	113						1						
	Land	38.1,2,3	VF	110	126	4	48					1					
			VB/T	132	148	73					2						
	General	38.1,3	VF	140	132	2	261										
			VB/T	124	129	74											
	Search & Misc.	38.1	VB/T	5													
21 Sept.	VF Sweep	38.1,3	VF	62	74	1		1			2	2	51		48		
	Land	38.1,2,3	VF	219	182	12	36	1			2	2	112	16	45	6	
			VB/T	185	193	128					1	1	2	2	1		
	Shipping	38.1,2,3	VF	197	124	5	31				1		6	34	32	13	
			VB/T	301	289	224	63	1			4		8				
	Search & Misc.	38.1	VF	4													

(Continued)

Date	Target	Target Defenses	Type A/C	Sorties Total	Sorties Attacking Target	Tons Bombs	Rockets	Own Aircraft Engaging En. A/C	Own Aircraft Dest. by En. A/C	Own Aircraft Encountered AA	Own Aircraft Dest by AA	Own Aircraft Op Loss	Enemy Aircraft Destroyed Engaged VF	Enemy Aircraft Destroyed Engaged VB/T	Enemy Aircraft Destroyed Air VF	Enemy Aircraft Destroyed Air VB/T	Enemy Aircraft Destroyed Ground
22 Sept.	VF Sweep	38 2,3	VF	30	28	4					1			1		1	
	Land	38 1,2	VF	64	58	5					1		10	6	8	3	
			VB/T	39	37	23											
	Shipping	38 1,2	VF	48	75								1		1		
			VB/T	89	76	54					1		6				
	General	38 1,3	VF	69	66	5	38						12		7		
			VB/T	115	114	73							2		2		
24 Sept.	Land	38 1,2	VF	79	76	4	72				2						
			VB/T	69	95	102	8										
	Shipping	38 1,2,3	VF	129	142	12					1		1		1		
			VB/T	97	89	41	36				1	3					
	General	38 1,2,3	VF	222	293	16	143	7			3		5		4		
			VB/T	184	192	117	64										
							TOTAL OFFENSIVE										
	VF Sweep		VF	320	398	5		22			6	5	108	5	84	5	
	Land		VF	1074	1013	45	421	11			8	4	261	22	111	9	
			VB/T	1127	1230	759	88				6	5	19	2	2		
	Shipping		VF	486	471	26	61				2		54	34	37	13	
			VB/T	621	593	410	99	1			6	5	14				
	General		VF	1067	1169	53	658	21			4	2	115	4	70	3	
			VB/T	1180	1197	716	168	1			6	5	58		5		
	Search & Misc.		VF	12										3		3	
			VB/T	5													
	Total		VF	2959	3051	129	1140	54			20	11	538	68	302	33	
			VB/T	2933	3020	1885	355	2			18	15	91	2	7		

DEFENSIVE ACTION BY FAST CARRIER FORCES IN THE OCCUPATION OF THE PHILIPPINES

9 - 24 September, 1944

Date	Type Mission	Task Desig.	A/C Type	Total Sorties	Losses AC	Losses Op	Engaged VF	Engaged VB/T	Destroyed By A/C VF	Destroyed By A/C VB/T
9 Sept.	CAP	38.1,2	VF	46	1		1	1	1	1
	Escort	38.1	VB/T	1						
12 Sept.	CAP	38.1,2	VF	14			2	2	2	1
13 Sept.	ASP	38.1	VF	1				1		
			VB/T	1				1		
21 Sept.	CAP	38.1	VF	8				1		1
22 Sept.	CAP	38.1	VF	18			3	3	2	2
24 Sept.	CAP	38.1,2,3	VF	24			3		3	
			TOTAL DEFENSIVE							
			VF	111	1		9	8	8	5
			VB/T	2				1		

FAST CARRIER "BLANKET" OPERATIONS IN CONNECTION WITH MINDORO LANDINGS

14 - 16 December 1944

I. U.S. Forces Engaged

U.S. Carrier Forces (TF 38)

38.1 - 2 CV, 2 CVL, 2 BB, 4 CA, 1 CL, 16 DD
Aircraft - 212 VF, 63 VB/T

38.2 - 3 CV, 2 CVL, 3 BB, 5 CL, 20 DD
Aircraft - 241 VF, 101 VB/T

38.3 - 2 CV, 2 CVL 3 BB, 4 CL, 17 DD
Aircraft - 214 VF, 63 VB/T

Total - 7 CV, 6 CVL, 8 BB, 4 CA, 10 CL, 53 DD
Aircraft - 667 VF, 227 VB/T

II. General Account of Action:

Landings at Mindoro by SouWesPac Forces, 15 December, had as their primary purpose the establishment of airfields within supporting distance of Luzon. To protect assault shipping, it was necessary that Japanese land-based air either be destroyed or prevented from launching attacks during the approach, landing, and unloading stages. To accomplish this task, a line dividing responsibility was drawn across Luzon at Tayabas Bay (roughly the 14th parallel) and areas to the south assigned to SouWesPac forces while the Fast Carriers were assigned all to the north.

The task force sortied Ulithi on 11 December and after fueling on the 13th, proceeded toward Luzon. Deceptive communication measures were used to conceal the date and area of attack. Initial launching point was about 200 miles bearing 57° from Manila.

Although target information was limited, there were 90-100 known or suspected enemy air fields in the Fast Carrier area. (23 of these were found to be non-existent and 32 not in operation.) These were allotted by areas among the three task groups and further subdivided and assigned to carriers and squadrons. Target priorities were: first, enemy aircraft; second, airfield installations; and third, enemy ships provided these could be attacked without sacrificing the primary mission.

Tactics employed by fast carriers were new in many respects and being successful became the prototype for later operations. The force was organized into three groups with more carriers in [illegible]. For the first time a night carrier, the Independence (CVL), was included in the force. "Tom Cats," or strike picket destroyers, also used for the first time, were to aid in controlling strikes and to give advance warning of enemy aircraft approaching the force. Aircraft complement for CV's was changed to 73 VF and 30 VB/T.

With the increased fighter complement it was possible to completely neutralize enemy air for the limited period. Essentially, this involved maintaining CAP over all of Luzon in sufficient strength day and night to prevent enemy air operations. After meeting requirements for local CAP, all remaining day fighters of each task group were divided into three groups. The first two were launched at dawn to take coordinated attacks in their assigned areas after which one returned while the other remained over the fields to hold down enemy aircraft. The third group was then launched and thereafter alternating groups launched and reported over the target as nearly as possible at the departure of the preceding group. Ten minutes were allowed between the arrival of one group over the target and the departure of the group relieved.

To meet this schedule, all planes proceeded to and from the target at maximum cruising speed. The last daylight strike left the target in time to land aboard before dark. During the night, six hecklers were kept over Luzon. About half the night flights were made by the Independence night air group, the rest by night fighters from other carriers.

The results were gratifying. Surprise was achieved at the outset. Only a few enemy aircraft appeared in the air and no large scale effort to stage-in aircraft was made. One group of 30 enemy fighters intercepted by 11 Ticonderoga fighters returning from their last sweep on the 14th was believed flying in from Formosa. Fast carrier forces were not attacked.

FAST CARRIER "BLANKET" OPERATIONS OVER LUZON

14 - 16 December 1944

Date	Task Desig.	Type A/C	Sorties Total	Sorties Attacking Target	Hours in Air	Tons Bombs	Rockets	Own Aircraft: Engaging En. A/C	Own Aircraft: Dest. by AA	Own Aircraft: Op. Loss	Enemy Aircraft: Engaged VF	Enemy Aircraft: Engaged VB/T	Enemy Aircraft: Destroyed Air VF	Enemy Aircraft: Destroyed Air VB/T	Enemy Aircraft: Destroyed Ground
14 Dec.	38.1	VF	211	177	860	25	448	7	4	2	5	3	2	3	
	38.2	VF	256	237	1,090	47	528	19	12	9	8	6	8	5	
	38.3	VF	158	122	510	1	325	11		5	30		22		
	38.2	VB/T	8	7	20	4				1					
	Total	VF	625	536	2,460	73	1,301	37	16	16	43	9	32	8	
		VB/T	8	7	20	4			1						
15 Dec.	38.1	VF	173	170	430	27	227	1	1	1	1		1		
	38.2	VF	206	191	790	23	311	9	3	2	7		7		
	38.3	VF	137	123	560	8	374	4			2		1		
	38.2	VB/T	100	94	430	41	62	2	2	2	3				
	Total	VF	516	484	1,780	58	912	14	4	3	10		9		
		VB/T	100	94	430	41	62	2	2	2	3				
16 Dec.	38.1	VF	150	150	660	17	324		2	1					
	38.2	VF	163	140	650	14	245	15	2		10	6	10	5	
	38.3	VF	135	103	610	7	268		1	1					
	38.2	VB/T	79	77	360	48	50		1	1					
	38.3	VB/T	73	66	310	49	99			1					
	Total	VF	448	393	1,920	38	837	15	5	2	10	6	10	5	
		VB/T	152	143	670	97	149		1	2					

FAST CARRIER "BLANKET" OPERATIONS OVER LUZON (Continued)

Date	Task Desig.	Type A/C	Sorties Total	Sorties Attacking Target	Hours in Air	Tons Bombs	Rockets	-- OWN AIRCRAFT -- Engaging En. A/C	Dest. by AA	Op. Loss	--- ENEMY AIRCRAFT --- Engaged VF	Engaged VB/T	Destroyed Air VF	Destroyed Air VB/T	Destroyed Ground
								TOTAL							
		VF	1,589**	1,413	6,160	1690	3,050	66	25	21	63	15	51	13	
		VB/T	260	244	1,120	142	211	2	3	5	3				208*

* This figure is not available in IBM Tabulations and is taken from CinCPac Summary
** Sorties include night flights of which there were 30 on 14th and 28 on 15th.

FAST CARRIER OPERATIONS AS A PRELIMINARY TO LANDINGS AT OKINAWA.

18 - 30 March 1945

I. Forces Employed

A. United States Forces

1. Joint Expeditionary Force - Task Force 51

Western Islands Attack Group - 1 AGC, 5 AKA, 5 AM, 13 APA, 5 APD, 1 APH, 1 ARL, 3 AV, 3 AVD, 4 AVP, 2 LCI, 18 LCT, 1 LSD, 11 LSM, 29 LST, 2 PC, 2 PCE, 3 PCS, 5 SC, 5 T, 8 DD, 6 DE

Demonstration Group - 1 AGC, 6 AKA, 15 APA, 2 APD, 1 APH, 20 LCI, 6 LCS, 11 LSM, 11 LST, 1 LSV, 2 PC, 1 PCS, 6 SC, 7 DD, 2 DE.

Expeditionary Force Floating Reserve - 6 AKA, 15 APA, 10 LSM, 6 DE

Service and Salvage Group - 1 ARB, 3 ARL, 3 ARS, 6 ATF, 2 AAR

Amphibious Support Force - 1 AKN, 36 AM, 7 AN, 14 APD, 2 CM, 13 DM, 13 DMS, 3 LC, 35 LCI, 20 LCP, 6 LG, 12 LSM, 4 PC, 5 PGM, 26 YMS, 14 CVE, 10 DD, 17 DE

Gunfire and Covering Force - 10 ORB, 9 CA, 4 CL, 23 DD 6 DD, 3 AVD

Northern Attack Force - 1 AGC, 5 XAK, 12 AKA, 1 AP, 2 XAP 32 APA, 4 LC, 40 LCI, 12 LCS, 30 LCT, 12 LCV, 3 LSD, 20 LSM, 68 LST, 3 LSV, 12 LVT, 4 PC, 3 PCE, 5 PCS 13 SC, 2 LX, 48 Barges, 4 DE

Southern Attack Force - 1 AGC, 1 AK, 2 XAK, 16 AKA, 1 AO, 1 AP, 1 XAP, 37 APA, 9 APD, 1 ARB, 2 ARL, 1 CGC, 67 LCI, 90 LCM, 5 LCP, 12 LCS, 67 LCT, 59 LCVP, 3 LSD, 48 LSM, 79 LST, 1 LSV, 4 PC, 2 PCE, 6 PCS, 9 SC, 6 YMS, 1 IX, 98 barges, 14 DD, 5 DE

Anti-Submarine Warfare Group - 2 CVE, 13 DE

Service Squadron 10 - 9 AD, 7 AFD, 1 AFDL, 5 AG, 1 AO, 4 AOG, 2 APC, 2 APL, 6 AR, 3 ARB, 5 ARD, 4 ARG, 1 ARH, 1 AH, 2 ARS, 2 AFA, 12 ATF, 3 ATO, 7 ATR, 1 DMS, 33 IX

Logistic Support Group - 4 AE, 1 AK, 39 AO, 4 ATF, 2 CVE, 4 CVET, 1 CL, 12 DD, 28 DE

2. Defense Forces and Shore-Based Air

Advanced Seaplane Group - 3 AV, 4 AVP, 45 PBM5, 6 PBM-3S

Advanced Landplane Group - 24 PB4Y2

Other Air Groups in Marianas and Western Carolines

3. Fast Carrier Forces - Task Force 58 (Replenished chiefly at Ulithi and at sea by Logistic Support Group, T.G.50.8) as of 18 March 1945.

10 CV, 6 CVL, 10 BB-CB, 3 CA, 11 CL, 64 DD
Aircraft - 846 VF, 140 VB, 203 VT

B. Japanese Forces

U.S. Intelligence estimates on 1 March 1945:

	VF	VB	VBL	VBM	VP	VSO	Total
Southern Kyushu	250	150		300			700
Nansei Shoto	24	12		12		30	78
Formosa	110	36	10	60	10	90	316
China	200	30	50	24	6	150	460
Total	584	228	60	396	16	270	1,554

Enemy Naval Forces.--The Japanese high command did not commit major surface units in this operation, but midget submarines and suicide craft were used increasingly in the assault areas. Approximately 400 of these small craft were captured at Kerama Retto. Enemy submarines were active around Okinawa during March, but did not threaten T.F. 58.

AA Defenses.--Scattered throughout the Nansei Shoto. Japanese anti-aircraft fire was the major cause of plane losses.

II. General Account of Action

The occupation of Okinawa required the largest amphibious operation mounted in the Pacific theater. The action brought American forces well inside Japan's inner defensive ring, and within 350 miles of the enemy homeland. All major commands of the Pacific Ocean Area had some responsibility for the attack, and aid was given by the Commander-in-Chief, Southwest Pacific Area, the Twentieth Air Force, and the Fourteenth Air Force. Approximately 550,000 men from the Navy, Army and Marines, 318 combatant vessels, and 1,139 auxiliaries took part in the operation. Phase I of the operation involved the capture of Kerama Retto and the southern part of Okinawa; Phase II, completion of the Okinawa occupation and capture of Ie Shima and Phase III, the capture of additional islands in the Nansei Shoto, to extend air bombardment and tighten the blockade noose around Japan. The Pre-Assault period digested here included the capture of Kerama Retto and all softening up operations prior to the amphibian landing made 1 April.

Enemy Air Support.--During the pre-assault period Japanese air support of their force in the Nansei Shoto consisted chiefly of attacks on carriers of Task Force 58 and during 26-31 March of numerous raids in the area of Kerama Retto. The raids generally were uncoordinated attacks on ships on patrol station, in the screen or in retirement areas.

Enemy air reaction to a carrier force near the empire was light in the number of planes used but intense in the attacks. From 1 to 3 planes came in with the recovery or launching of carrier aircraft, and avoided radar detection because of the saturated radar scope. They took skillful advantage of cloud cover to gain position for launching bomb or suicide attacks. On 21 March enemy Bettys came in with a small plane under the fuselage. This attack marked the first operational appearance of the Baka piloted bomb.

Enemy Naval Support.--During March operations there were no contacts with large surface ships. A few LCIs were damaged by suicide boat attacks. Submarines were active around Okinawa, where the ship concentrations reported numerous contacts. Many ASW actions resulted. One destroyer suffered torpedo damage and two successful attacks were made on Japanese SS. The first kill was made by Haggard (DD) while on picket duty ahead of a task group approaching Okinawa.

Land-Based Air.--Aircraft from the Marianas bases of the 21st Bomber Command assisted in photographing reconnaissance of the Nansei Shoto. The small-scale coverage made by B-29s aided the detection of changes made in enemy installations. The stepping up of raids on Tokyo, Nagoya and Okinawa absorbed some Japanese air strength which otherwise might have been thrown against the Okinawa operation.

The strength of the 21st Bomber Command increased during March from 378 to 454 B-29s.

Carrier Air.--Paralleling the overall Okinawa operation, the tasks assigned the carrier force were varied and complex. The fast carrier force had a joint responsibility for continuous photo-reconnaissance over the assault area, for strikes on enemy air fields in the Empire, Formosa, and the Nansei Shoto, on L-8 Day to provide air cover for minesweeping operations at the objective plus reconnaissance to detect mines, to prevent interference by enemy air with operations, to protect the Joint Expeditionary Force and Okinawa from attack by Japanese surface forces, conduct search and reconnaissance missions as directed, and be prepared for other operations in support of the capture and occupation of Okinawa Gunto.

14-17 March.--Sortied from Ulithi, fueled at sea on 16 March, and on the 17th approached Kyushu for early strikes the next morning. Numerous enemy snoopers approached the force, and remained in almost continuous contact.

18 March.--The first enemy plane was shot down by a VF(N) at 0104 on the 18th. At 0400 Enterprise (CV) launched 6 VTB(N) on a night radar-countermeasure flight, the purpose being to simulate a fleet 130-150 miles from the Task Force. Window also was used to jam enemy radar, but deception missed fire. The Japanese attacked in force at dawn, damaging both the Intrepid and Enterprise (CVs). The first fighter sweeps and CAP were launched at 0545, when Task Force 58 was approximately 100 miles east of Kyushu's southern tip. Airfields were hit so effectively that the enemy did not develop strong air attacks from this area for approximately three weeks.

19 March.--Task Force 58 moved northward to attack the Japanese fleet units concentrated at Kure and Kobe, located by air reconnaissance the preceding day. However, shore batteries and the numerous ships in the harbor threw up a flak barrage that at times approached a cone of fire over the target area. Because of the heavy anti-aircraft fire, U.S. losses were substantial, and the strike only moderately successful. A morning attack hit and badly damaged Franklin (CV). The task force returned in the afternoon, covering the disabled Franklin, and launched fighter sweeps against Kyushu airfields to prevent organized attacks on the slowly moving fleets. The sweeps were successful in delaying pursuit.

20 March.--Enemy planes were first sighted in the late afternoon, coming in low and fast. Fighters knocked down 7 Japanese aircraft and ships' AA another 7. One of the falling planes damaged Halsey's Powell (DD), slowed her to 10 knots, and delayed the southward retirement.

21 March.--An afternoon attack by 48 enemy planes was detected and intercepted 60 miles from the task force by 24 fighters

the loss of two Navy fighters.

During the four day period a total of 528 enemy planes were reported destroyed, with 260 splashed by airborne fighters, 46 shot down by task force AA fire, and 222 knocked out on the ground. Strikes launched on 18-19 March dropped 568 tons of bombs and fired 3,235 rockets. American aircraft losses totalled 168 planes, 74 in combat, 42 operationally, and 52 burned on board Franklin.

The bomb hits scored on Franklin put her out of action for the duration--one bomb struck the flight deck at frame 68, penetrated to the hangar deck and exploded there. The dead and missing totalled 832, and about 850 men were rescued from the water, where they had been blown by explosives or forced by the flames.

Four other carriers were hit by the daring and skillful enemy attacks. Wasp (CV) was heavily damaged by a bomb which penetrated the flight hangar and second deck, but continued in action. Intrepid and Yorktown (CVs) were slightly damaged. The 600-pound bomb which hit Enterprise (CV) neither exploded nor penetrated the deck, but subsequently friendly gunfire put Enterprise out of action.

23 March.--Task Force 58 began launching continuous strikes against Okinawa and the adjacent islands. Extensive bombing attacks on all known installations prepared the area for mine-sweeping operations and for the landing on Kerama Retto.

At dawn on 24 March, the fast battleships of Task Force 58 plus 3 destroyer divisions were formed into Task Group 59.7. The group bombarded defense installations on the southeastern coast of Okinawa and provided cover for U.S. minesweepers operating in the area. The defense installations were not extensive and the major damage was to structures in the small villages. Overall destruction was less than expected, but the divisionary purpose of the bombardment probably was realized.

25 March.--Fast carrier planes attacked airfield installations and suicide boat positions on Okinawa. CVE aircraft supported underwater demolition operations off Kerama Retto beaches. A total of 388 sorties was flown.

26 March.--Aircraft from Task Group 58 continued their search and destruction of enemy suicide boats, midget submarine bases, airfields and heavy gun installations on Okinawa, CVE planes generally operated in support of the Kerama Retto landings. Sorties rose to 424.

27-28 March.--Air attacks continued against suicide boat revetments, airfields, and gun installations on Okinawa. Bombs, napalm and rockets were directed against enemy barracks, and on the 28th, the adjoining eastern islands were attacked.. Carrier aircraft flew 856 sorties on 45 support missions.

29 March.--The fast carriers and part of the support carrier group were absent. Missions in the operations area dropped to 251, and were flown primarily to support underwater demolition teams on Hagushi beach. Task groups 58.1 and 58.3 made an abortive search for enemy fleet units reported moving southwesterly from Bungo channel. On their return to the carriers, planes from both groups bombed Kyushu airfields. Task Group 58.3 also attacked successfully a large number of miscellaneous ships and barges. The heavy strikes made on airfields in Kyushu and the nearer airfields in the Nansei Shoto effectively reduced the enemy's subsequent attempts to attacking our invading forces.

30-31 March.--Carrier air resumed to continue support of underwater demolitions on Hagushi beach and on request from the Tenth Army bombed bridges on Okinawa. Fast carrier and CVE aircraft flew 1,176 sorties on 65 missions, a new record averaging approximately 600 per day.

On 1 April, control of aircraft at the objective area was assumed by Commander Air Support Control Unit (CTF-51) on Eldorado(AGC).

FAST CARRIER OPERATIONS AS A PRELIMINARY TO LANDINGS AT OKINAWA
OFFENSIVE ACTION
18 - 30 March 1945

Date	Target	Task Dsg.	Type A/C	-- SORTIES -- Total	Attacking Target	Tons Bombs	Rockets	------- OWN AIRCRAFT ---------- Engaging En. A/C	Dest. by En. A/C	Encountered AA	Dest. by AA	Op. Loss	---- ENEMY AIRCRAFT ---- Destroyed Air Engaged VF	VB/T	Air VF	VB/T	Ground
18 March	Airfields	58.1,2, 3 4	VF	681	602	52	1,511	123	5	543	10	6	192	5	74	2	133
			VB/T	436	429	264	115	4	1	429	7	8	7				23
	Other Land	58.1,3	VF	56	51	7	187	14		39		1	23		9		
	Harbor Areas & Shipping	58.1,2, 4	VF	63	57	9	72			47	1	1					16
	Search & Reconnaissance	58.1,2,3	VF	71	46	8	16	14		40	1	3	18	3	2	3	1
19 March	Airfields	58.1,2, 3,4	VF	360	251	18	710	101	18	251	5	2	158		55		102
			VB/T	42	41	20				41	2						
	Other Land	58.1,3,4	VF	27	27	1	20	8		16			12		9		6
	Harbor Areas & Shipping	58.1,2, 3,4	VF	142	134	28	95	10		135	1	3	7		7		7
			VB/T	192	181	141	55	1		181	14	1		1		1	
	Search & Reconnaissance	58.1,3	VF	17	17		98	5						5		1	
								TWO-DAY TOTAL									
	Airfields		VF	1,041	853	70	2,221	224	23	794	15	8	350	5	129	2	235
			VB/T	478	470	284	115	4	1	470	9	8	7				23
	Other Land		VF	83	78	8	207	22		55		1	35		18		6
	Harbor Areas & Shipping		VF	205	192	37	167	10		182	2	4	7		7		23
			VB/T	192	181	141	55	1		181	14	1		1		1	
	Search & Reconnaissance		VF	88	63	8	114	19		40	1	3	18	8	2	4	1
	Total		VF	1,417	1,186	123	2,709	275	23	1,071	18	16	410	13	156	6	265
			VB/T	670	651	425	170	5	1	651	23	9	7	1		1	23

(Continued)

				- - SORTIES - -				- - - - - - - OWN AIRCRAFT - - - - - - - - - -					- - - - ENEMY AIRCRAFT - - - -				
													Engaged		Destroyed in Air		
Date	Target	Task Dest'n.	Type A/C	Total	Attacking Target	Tons Bombs	Rockets	Engaging En. A/C	Dest. by En. A/C	Encountered AA	Dest. by AA	Op. Loss	VF	VB/T	VF	VB/T	Ground
23 March	Airfields	58.[illegible],3,4	VF	119	106	14	264			72	3						4
			VB/T	39	39	29				30	1						
	Other Land	58.2,3,4	VF	271	215	15	882	1		118			1		1		
			VB/T	286	278	179	6			130		4					
	Harbor Areas & Shipping	58.[illegible],3	VF	50	47	4	269			27							6
			VB/T	12	12	6	68			12							
	Search & Misc.	58.[illegible],3	VF	20	16		60	2		6			1		1		
24 March	Airfields	58.3,4	VF	230	218	42	579			194	2	1					12
			VB/T	90	90	75	24			56	2						
	Other Land	58.2,3,4	VF	248	244	33	953			150	3						
			VB/T	239	238	98	84			172	2	1					
	Harbor Areas & Shipping	58.3,3,4	VF	85	83	4	333			78							
			VB/T	75	71	51				71	3	1					
	Search & Misc.	58.2,3,4	VF	54	49		186			36	1						
			VB/T	2	2												
25 March	Airfields	58.2	VF	44	44	3	208			42	1						4
			VB/T	25	24	17	20			24							
	Other Land	58.[illegible]	VF	38	36	4	169			21		1					
			VB/T	76	74	47	146			57		1					
	Harbor Areas & Shipping	58.3	VF	8	8	1	24			8							
			VB/T	28	28	17	48			28							
	Search & Misc.	58.3	VF	20	16		24	2		8			1		1		
26 March	Airfields	58.3,4	VF	107	103	15	395			103	2	2					
			VB/T	68	68	46				68	1	1					3

(Continued)

				-- SORTIES --				-------- OWN AIRCRAFT --------					---- ENEMY AIRCRAFT ----				
													Engaged		Destroyed Air		
Date	Target	Tac Rec [illegible]	Type A/C	Total	Attacking Target	Tons Bombs	Rockets	Engaging En. A/C	Dest. by En. A/C	Encountered AA	Dest. by AA	Op. Loss	VF	VB/T	VF	VB/T	Ground
26 March	Other Land	58. ,4	VF	128	124	26	464			124	1	1					
			VB/T	155	151	89	205			151	1	1					
	Harbor Areas & Shipping	58. ,4	VF	36	35	10	199			35	3						
			VB/T	23	23	15				23							
	Search & Misc.	58. ,4	VF	24	18		44			12	1						
			VB/T	8	8	5	32			8							5
27 March	Airfields	58.3 +	VF	101	97	15	316			94	2						1
			VB/T	102	102	70	88			78	1						
	Other Land	58.3,4	VF	73	68	14	245			65							
			VB/T	95	91	55	185			78		1					
	Harbor Areas & Shipping	58.1,3,4	VF	141	134	13	391			122	5						9
			VB/T	77	73	51	32			67							
28 March	Airfields	58.1,3	VF	90	55	6	52	34		55	4	2	20	4	6	4	10
			VB/T	51	50	28				42	1						
	Other Land	58.1,3	VF	97	91	15	207			66		2					
			VB/T	93	79	53	108			47							
	Harbor Areas & Shipping	58.1,3	VF	43	29	2	119			22	1	1					
			VB/T	52	44	22				20		1					
	Search & Misc.	58.1	VF	16	15	2	24	1		4				1			
			VB/T	8	8												
29 March	Airfields	58.1,3,4	VF	176	166	34	213	8		166		3	5	1		1	10
			VB/T	105	94	87				71		2					1
	Other Land	58.3	VF	19	19	4	04			19							1
	Harbor Areas & Shipping	58.3,	VF	67	63	14	88	12	1	63	1		23		12		1
			VB/T	67	46	51				38	1	4					
	Search & Misc.	58.3,4	VF	4				3	1				2				

(Continued)

Date	Target	Tr.. Dr..g.	Type A/C	- - SORTIES - - Total	Attacking Target	Tons Bombs	Rockets	- - - - - - - - - OWN AIRCRAFT - - - - - - - - - Engaging En. A/C	Dest. by. En. A/C	Encoun-tered AA	Dest. by AA	Op. Loss	- - - - ENEMY AIRCRAFT - - - - Engaged VF	Engaged VB/T	Destroyed Air VF	Destroyed Air VB/T	Destroyed Ground
30 March	Airfields	58.3,4	VF	72	65	16	18			39	1						
			VB/T	25	25	14	56										
	Other Land	58.3,4	VF	132	128	21	552			54							
			VB/T	160	152	89	215			52		3					
	Harbor Areas & Shipping	58.3,4	VF	34	33	6	80			21		1					2
			VB/T	29	29	24				22							
	Search & Misc.	58.3,4	VF	3				2						4		2	
	EIGHT-DAY TOTAL																
	Airfields		VF	939	854	145	2,045	42		765	15	8	25	5	6	5	41
			VB/T	505	492	366	188			369	6	3					4
	Other Land		VF	1,006	925	132	3,536	1		617	4	4	1		1		1
			VB/T	1,104	1,063	610	949			687	3	11					
	Harbor Areas & Shipping		VF	464	432	54	1,503	12	1	376	10	2	23		12		18
			VB/T	363	326	237	148			281	4	6					
	Search & Misc.		VF	141	114	2	338	10	1	66	2		4	5	2	2	
			VB/T	18	18	5	32			8							5
	Total		VF	2,550	2,325	333	7,422	65	2	1,824	31	14	53	10	21	7	60
			VB/T	1,990	1,899	1,218	1,317			1,345	13	20					9

ENCLOSURE F
CTF 58 Report of Operations

FAST CARRIER OPERATIONS AS A PRELIMINARY TO LANDINGS AT OKINAWA

DEFENSIVE ACTION

18-23 March, 23-30 March, 6, 12, 16 April 1945

				OWN AIRCRAFT					ENEMY AIRCRAFT								OWN SHIPS				
						Losses			Attacking				Engaged		Destroyed By A/C			Destroyed By		Sunk		Damaged
Date	Mission	Task Desig.	Type A/C	Sorties	Engaging En. A/C	A/C	AA	OP	VF	VB/T	Tactics	Ordnance	VF	VB/T	VF	VB/T	Gr.	AA	Unit Attacked	Type	No.	Type	No.
18 Mar.	CAP Target	58.1,4	VF	18	2									1		1							
	CAP Local	58.1	VF	4	1									1		1							
		58.3	VF	4	4								1	1	1	1							
		58.4	VF	45	13					3-*	Dive Bomb	Bomb	2	7	1	6		2	58.4			CV	2**
19 Mar.	CAP Target	58.1,4	VF	24	5									2		2							
	CAP Local	58.1	VF	19	12						Dive Bomb		3	5	3	2						CV	1***
		58.2	VF	32	16					3	Dive Bomb		4	4	4	4		1	58.1,2,3,4			CV	1
		58.3	VF	20	15			1		6			2	1	2	1							
		58.4	VF	15	7									2									
21 Mar.	CAP Target	58.1,4	VF	24	18								2	5	2	5							
	CAP Local	58.1	VF	24	16	1					Intercepted 60 mi. from Force)		25	44	12	28			(Did not close the Force)				
		58.2	VF	12	9								1	2	1	1							
		58.3	VF	24	20								2	1	2	1							
		58.4	VF	8	6	1								8									
Total Target				66	25								2	8	2	8							
Total Local(1)				207	119	2		1					40	76	26	45							
18 March				53	18								3	9	2	8							
19 March				86	50			1					9	12	9	7							
21 March				68	51	2							28	55	15	30							

(1) On 18-19 March, 913 VF local CAP & ASP sorties and 127 VF and 13 VB/T Search and Miscellaneous sorties were flown by planes of Task Force 58.

* In three attacks.
** Includes Enterprise which was damaged superficially by a dud and Yorktown with minor damage.
*** The Wasp - Resumed operations in 1 hour.

(Continued)

ENCLOSURE A

23-30 March 1945

				OWN AIRCRAFT								ENEMY AIRCRAFT						OWN SHIPS				
						Losses			Attacking				Engaged		Destroyed By A/C			By		Sunk		Damaged	
Date	Mission	Task Desig.	Type	Sorties	Engaging En. A/C	A/C	AA	OP	VF	VB/T	Tactics	Ordnance	VF	VB/T	VF	VB/T	Gr.	AA	Unit Attacked	Type	No.	Type	No.
23 Mar.	CAP Local	58.1,4	F	16	6								1	1	1	1							
24 Mar.	CAP Local	58.4	F	20	1			1						1		1							
25 Mar.	CAP Target	58.1	F	88			1																
26 Mar.	CAP Target	58.3,4	F	103	4			2					1		1		1						
27 Mar.	CAP Local	58.1,3	F	68	18								2	3	2	2							
	CAP Target	58.1,3,4	F	139	4		1						1		1		1						
28 Mar.	CAP Local	58.1	F	4	2								1	1	1	1							
	CAP Target	58.1	F	29																			
29 Mar.	CAP Local	58.3,4	F	21	11	2		2					10	1	7								
	CAP Target	58.3,4	F	26	8		2						1	2	1	2	5						
30 Mar.	CAP Target	58.1,3,4	F	61			1																
TOTAL •	CAP Local		F	129	38	2		3					14	7	11	5							
	CAP Target		F	446	16		5	2					3	2	3	2	7						

• Does not show planes attacking target which were as follows:

CAP Local - 12 planes attacked targets, 6 encountered AA, 1 ton of bombs dropped.

CAP Target - 343 planes attacked targets, 114 encountered AA, 11 tons of bombs dropped, 762 rockets expended.

(Continued)

ENCLOSURE F

6, 12, 16 April 1945

Date	Mission	Task Desig.	Type A/C	Sorties	Engaging En. A/C	Losses A/C	Losses AA	Losses OP	Attacking VF	Attacking VB/T	Tactics	Ordnance	Engaged VF	Engaged VB/T	Destroyed By A/C VF	Destroyed By A/C VB/T	Destroyed By A/C Gr.	Destroyed By AA	Unit Attacked	Sunk Type	Sunk No.	Damaged Type	Damaged No.
6 April	CAP Local	58.1	VF	36	20								8	5	8	5							
		58.3	VF	58	41	1							56	12	26	10							
	CAP Other	58.1	VF	126	72			1					55	96	47	90							
		58.3	VF	8	4								5	4	5	4							
12 April	CAP Local	58.1	VF	47	20	1							18	2	16	2							
		58.2	VF	18	6									2		1							
		58.3	VF	34	31								16	19	12	16							
	CAP Other	58.1	VF	40	26	1							37	8	23	7							
		58.2	VF	4	4									1		1							
		58.3	VF	12	8								10	4	6	4							
		58.4	VF	20	20	2	1						21	18	10	16							
	CAP Target	58.1	VF	20			1																
		58.2	VF	4	2								3		3								
		58.3	VF	12																			
		58.4	VF	24	4								2	1	2	1							
16 April	CAP Local	58.1	VF	65	37								21	5	15	5							
		58.3	VF	80	39	2		3					77	4	30	4							
		58.4	VF	24	13								4	8	4	7							
	CAP Other	58.1	VF	28	17								20	13	19	12							
		58.4	VF	24	20								36	11	33	10							
	CAP Target	58.1	VF	24																			
		58.3	VF	8																			
TOTAL	CAP Local		VF	362	207	4		3					200	57	111	50							
	CAP Other		VF	262	171	3	1	1					184	155	143	144							
	CAP Target		VF	92	6		1						5	1	5	1							

FAST CARRIER OPERATIONS AS A PRELIMINARY TO LANDINGS AT OKINAWA

NIGHT ACTION

21 March - 6 April 1945

				- - SORTIES - -				- - - - - - - - OWN AIRCRAFT - - - - - - - - - -					- - - - ENEMY AIRCRAFT - - - -				
													Destroyed				
													Engaged		Air		
Date	Target	Task Desi...	Type A/C	Total	Attacking Target	Tons Bombs	Rockets	Engaging En. A/C	Dest. by En. A/C	Encountered AA	Dest. by AA	Op. Loss	VF	VB/T	VF	VB/T	Ground
21 Mar.	CAP Local	58.4	VF	2				1						1		1	
26 Mar.	CAP Local	58.4	VF	4				1						2		2	
	CAP Target	58.4	VF	2	2					2							
27 Mar.	CAP Local	58.1	VF	1				1						2		2	
29 Mar.	CAP Local	58.4	VF	4				1						1		1	
31 Mar.	CAP Local	58.4	VF	2				1						1		1	
1 Apr.	CAP Other	58.3	VF	2				2					1				
	CAP Local	58.3	VF	2				2					1	2	1	2	
2 Apr.	CAP Local	58.4	VF	2				1						1		1	
	CAP Other	58.1	VF	2				2					2		2		
4 Apr.	CAP Local	58.3	VF	1				1						1		1	
5 Apr.	CAP Other	58.4	VF	2				2					2	1	2	1	
	Miscellaneous	58.4	VF	2	2												
6 Apr.	CAP Local	58.1	VF	2				1					1		1		
TOTAL	CAP Local		VF	20				10					2	11	2	11	
	CAP Target		VF	2	2					2							
	CAP Other		VF	6				6					5	1	4	1	
	Miscellaneous		VF	2	2												

* Coded as Target CAP without a specified target.

FAST CARRIER FORCES IN THE ASSAULT ON JAPAN

10 July - 15 August 1945

A. United States Forces Engaged

1. Fast Carrier Forces - Task Force 38. Based at Leyte Gulf (2000 miles) and Ulithi (1700 miles). Replenished at sea by Service Squadron Six (T. G. 30.8), and at bases by Service Squadron Ten.

T.G. 38.1 - 3 CV, 2 CVL, 3 BB, 7 CL, 21 DD
Aircraft - 268 VF, 102 VB/T

T.G. 38.3 - 3 CV, 2 CVL, 3 BB, 6 CL, 18 DD
Aircraft - 267 VF, 108 VB/T

T.G. 38.4 - 4 CV, 2 CVL, 2 BB, 4 CA, 2 CL, 22 DD
Aircraft - 302 VF, 125 VB/T

Flagship 1 BB

2. Support Forces and Land-Based Air

British Carrier Force. Based at Manus (2500 miles). Replenished at sea.

T.F. 57 - 4 CV, 1 BB, 3 CL(AA), 3 CL, 18 DD

Land-Based Air

Tactical Air Force of the Pacific, composed of the Thirteenth Air Force (based in the Philippines), Fifth Air Force (Ryukus), elements of the Seventh Air Force (Marianas) and Marine Air Wing Units. The Tactical Air Force operated P-47s, P-51s, P-61s, B-24s, B-25s, A-26s, F4Us, and TBMs. Marine Fleet Air Wings One and Eighteen flew patrols over designated areas.

The Twentieth Air Force, with five complete B-29 bombardment wings, reached full operating strength at the end of July. During August, the Eighth Air Force was readied for operations and joined the Twentieth as a component of the Strategic Air Force. Its participation consisted of 82 B-29s sent on the final Strategic Air Force raid with a total of 725 planes.

B. Japanese Forces

1. Aircraft -

During the period 10 July - 15 August 1945, approximately 200 airfields were available in the seven areas of Tokyo, North Honshu, Hokkaido, Nagoya, Osaka, Kure and Kyushu. No complete reconnaissance was made within one day, or week, and no estimate exists of the number operational at any given time. However, the enemy moved few aircraft during the entire six weeks, so that the first photographic runs over the fields provided a fair approximation of the total planes operational in mid-July. Photo-reconnaissance taken from 180 of 199 Japanese fields picked up 4,107 aircraft, divided into 2,725 single-engine, 754 twin-engine, 527 single-engine trainers, and 61 float planes.

2. Submarines -

Japanese SS activities in the Central Pacific during July was concentrated in the area immediately west of Eniwetok. Midget submarines continued operations in the Okinawa area. One contact, but no attack by enemy SS, was reported during August.

3. AA Defenses -

The approximately 200 Japanese airfields given photo-reconnaissance generally were well defended by AA installations. The important fields were protected by large numbers of the mobile and easily concealed smaller automatic weapons which the Japanese had developed to a high degree of efficiency. However, the planes dispersed (in woods and other places) did not have the effective AA defense provided aircraft parked in small areas near the airfields.

II. General Account of Action

Fast Carrier strikes against Japan continued the series of gradually intensified air attacks initiated in early 1945. The immediate objective was the destruction of remaining Japanese sea and air forces. The secondary objective was to assist land-based air and other fleet activities by destroying the capacity and will of the Japanese to resist invasion.

Task Force 38 launched 9 heavy attacks between 10 July and the receipt of Fleet Admiral Nimitz's order to "cease fire" on 15 August. Three of the attacks covered two days, and put carrier-based air over Japan an average of one day in three from 10 July until enemy capitulation. Intensive anti-aircraft fire was encountered during all strikes, but the enemy first mounted aggressive airborne opposition during the two-day raid of 24-25 July. Air opposition was again intense on 28 July, but again was ineffective. The final enemy effort came 13 August when the Japanese attempted to get through to the fleet. The protective air screen proved too strong for the weakened Japanese air strength.

During 10 July-15 August Task Force 38 destroyed and damaged 2,804 Japanese aircraft, sank or damaged 148 warships, and 1,598 merchant ships, destroyed 195 locomotives and damaged an additional 109. Naval air power effectively supplemented B-29 raids with hard blows at industrial targets and basic war industries.

Enemy Air and Submarine Activity.--Following the loss of Okinawa, Japanese submarines generally were called back to defend the home islands. A substantial number of SS also were utilized for anti-submarine war. The enemy increased the number of cargo submarines in an attempt to supply positions by-passed by United States and Allied forces.

Excluding the sinking of the Indianapolis on 30 July, Japanese submarines were ineffective and took a negligible toll of men and ships. No submarine contacts were made by Task Force 38 and no attacks developed. The Hunter-Killer group providing ASW for Service Squadron Six (TG 30.8) sighted, damaged and sank a Japanese submarine on 16 July. The Task Group made no further contacts.

Despite serious aircraft losses during the Okinawa Campaign, the enemy could muster above 5,000 operational aircraft on 1 July 1945. Such a force permitted heavy resistance to air attack. It soon was apparent, however, that he would oppose carrier aircraft on only the most favorable conditions. This decision probably resulted from the severe aircraft losses sustained in earlier attacks on fast carrier forces, the short supply of aviation gasoline, maintenance difficulties, and the [illegible] invasion shipping.

Effective photo-reconnaissance, followed by heavy strikes on all significant airfields, produced such heavy losses among grounded aircraft that any loss reduction from refusing combat was small. Fast carrier strikes destroyed approximately 1,100 grounded planes, all operational, and damaged an additional 1,200, an average of about 200 destroyed or damaged per strike day.

Land-Based Air.-The capture and development of airfields on Okinawa brought Army and Marine bombers, fighters, and patrol planes of the Tactical Air Force and Fleet Air Wings One and Eighteen within easy range of the China Coast, Korea, Shikoku, Kyushu, and southern Honshu. Japanese shipping in these waters came to virtual standstill. Airfields on Saipan and Tinian were steadily increased to handle more B-29's, and construction of emergency landing fields on Iwo Jima permitted heavier bomb loads per plane. The strategic bombing of vital industrial centers increased steadily and Japanese harbors and sea lanes were blocked by thousands of aerial mines. This destruction of the enemy homeland was increased by bombing from carrier aircraft and bombardment by surface forces. On 5 and 9 August, atomic bomb attacks on Hiroshima and Nagasaki extended physical damage and completed destruction of the Japanese will to continue resistance.

Carrier Air.--The assigned task of the Fast Carrier Forces was to make photographic air reconnaissance of Japan, north of 37°N, and to attack aircraft and strategic targets in the Tokyo area, northern Honshu, and on Hokkaido by air strikes and surface bombardment. The major objectives of the operations were to assess the Japanese war potential in Hokkaido and northern Honshu, to reduce the enemy's tactical air strength, and to destroy installations which directly supported his war effort. The Fast Carrier Force was composed of the U.S. Third Fleets TF-38 and, beginning 16 July, the British fast carrier TF-57. Together, the two made up the most powerful fleet yet assembled.

1 July.--Task Force 38 sortied from San Pedro Harbor, Leyte Gulf,

10 July.--Strikes against airfields on the Tokyo plain from Koriyama on the north to Hamamatsu, a spread of 210 miles. Each task group attacked one geographical area. Battle reports listed 110 Japanese planes destroyed, only one airborne, and 231 damaged. The only plane engaged in the air was shot down 25 miles from Task Group 38.4, and no Japanese aircraft reached the task force.

14-15 July.--Strikes were launched against northern Honshu and Hokkaido from approximately 80 miles off shore. Airfields of the region were badly weathered in, which required the carrier aircraft to substitute targets of opportunity particularly shipping, railroads, and various ground installations. Task force planes reported sinking 4 warships, 25 merchant ships, and six train ferries, a total of 100,400 tons, and damaging 14 warships, 37 merchant ships, and two train ferries. Destruction and damage of the train ferries virtually deprived Honshu of Hokkaido's important agricultural and mineral products.

17 July.--The combined U.S. and British carrier forces launched strikes against airfields on the Tokyo plain, but a heavy cloud cover precluded effective [illegible] after two strikes had damaged only 4 grounded planes.

18 July.--Three strikes reported destruction of a heavy cruiser, 2 destroyers, and several smaller craft at Yokosuka, plus 52 planes on airfields in and around Tokyo.

24-25 July.--The outstanding success of this attack was achieved at the Kure Naval Base where British and American pilots estimated 22 warships, totalling 258,000 tons, were sunk and damaged. Airfields at Nagoya, Osaka, and Miho were well worked over. A total of 132 planes were destroyed, 31 airborne. The four which threatened the surface ships were shot down by fighter planes, three by British aircraft. Strong air opposition appeared for the first time.

28 July.--Task Forces 37 and 38 launched the second series of strikes against the Inland Sea area. Kure again was the principal target on the 28th. Ise (BB/XCV) was sunk in shallow water, Haruna (BB) forced to beach herself, Aoba (CA) sunk, and Oyodo (CL) capsized. Fighter sweeps over important airfields reported 123 enemy aircraft destroyed. Enemy airborne opposition was again strong, and 21 enemy fighters were shot down. The Americans and British lost 35 planes in combat.

30 July.--One of the most powerful carrier attacks yet made was launched against central Honshu from Tokyo to Nagoya, and across to Naizura on the Japanese Sea. Combined British and American attacks destroyed 122 enemy planes and damaged 154. The greatest damage to aircraft was done in the Nagoya area.

9-10 August.--A typhoon moving toward Kyushu deferred the operations scheduled for that area on 5 August. Task Forces 38 and 37 moved northward and on 9 August launched strikes against the Honshu-Hokkaido area. A total of 201 planes was destroyed on the ground, 102 damaged, with 6 warships and 2 merchantmen sunk. No air opposition appeared over the target areas, and British and American losses were limited to 14 planes.

This pattern was repeated the second day. AA fire was moderate, no airborne opposition appeared, and allied losses totalled 13 planes. Some 150 Japanese planes were destroyed in northern Honshu, and 105 reported damaged. Merchant shipping was hit in area ports, and railroads attacked.

13 August.--Operations were resumed despite bad weather and heavy destruction inflicted on the Tokyo area. Electronics plants were hit, as well as the usual airfield installations. A total of 254 planes were reported destroyed on the ground, and 149 damaged. No airborne opposition appeared over target areas. Japanese air effort was concentrated on the surface ships, with the attack intensified at dusk. CAP broke up all attacks, shooting down 18 planes, with one splashed by returning strike planes.

15 August.--Only one strike had been completed against Tokyo airfields when word was received that Japan had accepted Allied surrender terms. A total of 36 enemy aircraft were destroyed, 26 airborne. The second strike jettisoned its bombs and returned to the carriers. CAP later drove off enemy planes approaching the surface ships, shooting down 8 of them. Task Force losses were 11 planes, with 7 down in combat and 4 operationally.

FAST CARRIER FORCES IN THE ASSAULT ON JAPAN
OFFENSIVE ACTION

10 July - 15 August 1945

Date	Target	Task Desig.	Type A/C	-- SORTIES -- Total	Attacking Target	Tons Bombs	Rockets	OWN AIRCRAFT: Engaging En. A/C	Dest. by En. A/C	Encountered AA	Character of AA	Dest. by AA	Op. Loss	ENEMY AIRCRAFT: Destroyed Air Engaged VF	Engaged VB/T	Air VF	Air VB/T	Ground
10 July	Airfields	38.1	VF	380	336	72	814			322		4						73
		38.3	VF	261	246	52	299			164		2	1					18
		38.4	VF	177	164	31	408			131		2						9
		38.1	VB/T	160	154	102	29			154		1	2					36
		38.3	VB/T	141	141	98				111		5	1					6
		38.4	VB/T	147	145	96	16			81								9
		Total	VF	818	746	155	1,521			617		8	1					100
			VB/T	448	440	296	45			346		6	3					51
	Mil. Install.	38.3	VB/T	5	5	4				5								
	Search & Misc.	38.4	VF	4														
14 July	Airfields	38.1	VF	43	40		157			30								
		38.3	VF	24	23	4	88			23								9
		38.4	VF	20	20	2	74			12								24
		38.4	VB/T	9	9	9												2
		Total	VF	87	83	6	319			65								33
			VB/T	9	9	9												2
	Mil. Install.	38.1	VF	54	44		183			32		1						
		38.1	VB/T	43	32	14	28			32			1					
	Ships & Harbors	38.1	VF	33	29	8	130			29								1
		38.3	VF	64	63	10	269			67			1					
		38.4	VF	51	51	7	146			51			1					

(Continued)

28 July.--Task Forces 37 and 38 launched the second series of strikes against the Inland Sea area. Kure again was the principal target on the 28th. ISE (BB/XCV) was sunk in shallow water, Haruna (BB) forced to beach herself, Aoba (CA) sunk, and Oyodo (CL) capsized. Fighter sweeps over important airfields reported 123 enemy aircraft destroyed. Enemy airborne opposition was again strong, and 21 enemy fighters were shot down. The Americans and British lost 35 planes in combat.

30 July.--One of the most powerful carrier attacks yet made was launched against central Honshu from Tokyo to Nagoya, and across to Naizura on the Japanese Sea. Combined British and American attacks destroyed 122 enemy planes and damaged 154. The greatest damage to aircraft was done in the Nagoya area.

9-10 August.--A typhoon moving toward Kyushu deferred the operations scheduled for that area on 5 August. Task Forces 38 and 37 moved northward and on 9 August launched strikes against the Honshu-Hokkaido area. A total of 201 planes was destroyed on the ground, 102 damaged, with 6 warships and 2 merchantmen sunk. No air opposition appeared over the target areas, and British and American losses were limited to 14 planes.

This pattern was repeated the second day. AA fire was moderate, no airborne opposition appeared, and allied losses totalled 13 planes. Some 150 Japanese planes were destroyed in northern Honshu, and 105 reported damaged. Merchant shipping was hit in area ports, and railroads attacked.

13 August.--Operations were resumed despite bad weather and heavy destruction inflicted on the Tokyo area. Electronics plants were hit, as well as the usual airfield installations. A total of 254 planes were reported destroyed on the ground, and 149 damaged. No airborne opposition appeared over target areas. Japanese air effort was concentrated on the surface ships, with the attack intensified at dusk. CAP broke up all attacks, shooting down 18 planes, with one splashed by returning strike planes.

15 August.--Only one strike had been completed against Tokyo airfields when word was received that Japan had accepted Allied surrender terms. A total of 36 enemy aircraft were destroyed, 26 airborne. The second strike jettisoned its bombs and returned to the carriers. CAP later drove off enemy planes approaching the surface ships, shooting down 8 of them. Task Force losses were 11 planes, with 7 down in combat and 4 operationally.

FAST CARRIER FORCES IN THE ASSAULT ON JAPAN
OFFENSIVE ACTION

10 July - 15 August 1945

Date	Target	Task Desig.	Type A/C	-- SORTIES -- Total	Attacking Target	Tons Bombs	Rockets	OWN AIRCRAFT: Engaging En. A/C	Dest. by En. A/C	Encountered AA	Character of AA	Dest. by AA	Op. Loss	ENEMY AIRCRAFT: Engaged VF	Engaged VB/T	Destroyed Air VF	Destroyed Air VB/T	Destroyed Ground
10 July	Airfields	38.1	VF	380	336	72	814			322		4						73
		38.3	VF	261	246	52	299			164		2	1					18
		38.4	VF	177	164	31	408			131		2						9
		38.1	VB/T	160	154	102	29			154		1	2					36
		38.3	VB/T	141	141	98				111		5	1					6
		38.4	VB/T	147	145	96	16			81								9
		Total	VF	818	746	155	1,521			617		8	1					100
			VB/T	448	440	296	45			346		6	3					51
	Mil. Install.	38.3	VB/T	5	5	4				5								
	Search & Misc.	38.4	VF	4														
14 July	Airfields	38.1	VF	43	40		157			30								
		38.3	VF	24	23	4	88			23								9
		38.4	VF	20	20	2	74			12								24
		38.4	VB/T	9	9	9												2
		Total	VF	87	83	6	319			65								33
			VB/T	9	9	9												2
	Mil. Install.	38.1	VF	54	44		183			32		1						
		38.1	VB/T	43	32	14	28			32			1					
	Ships & Harbors	38.1	VF	33	29	8	130			29								1
		38.3	VF	64	63	10	269			67			1					
		38.4	VF	51	51	7	146			51			1					

(Continued)

				-- SORTIES --				---------- OWN AIRCRAFT ----------					---- ENEMY AIRCRAFT ----				
													Engaged		Destroyed Air		
Date	Target	Task Desig.	Type A/C	Total	Attacking Target	Tons Bombs	Rockets	Engaging En. A/C	Dest. by En. A/C	Encountered AA	Character of AA	Dest. by AA	Op. Loss	VF	VB/T	VF	VB/T	Ground
14 July	Ships & Harbors	38.1	VB/T	40	38	23				38			1					
		38.3	VB/T	133	132	100	20			123		6	2					
		38.4	VB/T	91	85	77				54		2	1					
		Total	VF	148	143	25	545			141			2					1
			VB/T	264	255	200	20			215		8	4					
	Transportation Facilities	38.1	VF	57	56		231			28								1
		38.1	VB/T	29	29	24				14								
			VB/T	9	9	9												
		Total	VB/T	38	38	33				14								
	Industrial Areas	38.1	VF	17	17		84			17								
		38.1	VB/T	31	31	16	47			31								
		38.4	VB/T	17	17	10				13		1						
		Total	VB/T	48	48	26	47			44		1						
	Search & Misc.	38.1	VF	4	4					4		1						
		38.3	VF	15	15		47											
		38.4	VF	8														
		Total	VF	27	19		47			4		1						
15 July	Airfields	38.1	VF	20	19	4	70			19								2
		38.3	VF	38	37	4	122			18		1						3
		38.4	VF	24	23	3	96			12		1	1					
		38.1	VB/T	45	44	31	18			44								
		38.4	VB/T	9	9	9												
		Total	VF	82	79	11	288			49		2	1					5
			VB/T	54	53	40	18			44								
	Mil. Install.	38.1	VF	62	58	8	145			49			1					
		38.3	VF	56	56	7	204			20		1						
		38.4	VF	12	12	2												
		Total	VF	130	126	17	349			69		1	1					

(Continued)

				- - SORTIES - -				- - - - - - - - - OWN AIRCRAFT - - - - - - - - - - - -					- - - - ENEMY AIRCRAFT - - - -				
													Engaged		Destroyed Air		
Date	Target	Task Desig.	Type A/C	Total	Attacking Target	Tons Bombs	Rockets	Engaging En. A/C	Dest. by En. A/C	Encountered AA	Character of AA	Dest. by AA	Op. Loss	VF	VB/T	VF	VB/T	Ground
15 July	Mil. Install.	38.1	VB/T	65	63	55	12			55			2					
		38.3	VB/T	14	14	7												
		38.4	VB/T	33	33	31				18								
		Total	VB/T	112	110	93	12			73			2					
	Ships & Harbors	38.1	VF	21	19		70			19								
		38.3	VF	43	43	10	111			24								
		38.4	VF	61	60	8	183			46		4	1					
		38.1	VB/T	14	14	14				14								
		38.3	VB/T	47	47	44				36			1					
		38.4	VB/T	22	22	13				13								
		Total	VF	125	122	18	364			89		4	1					
			VB/T	83	83	71				63			1					
	Transportation Facilities	38.1	VF	22	22	2	82			14								1
		38.3	VF	12	12	3	46			8								
		38.4	VF	42	34	2	186			10		1						
		38.4	VB/T	37	25	21				24		1						
		Total	VF	76	66	7	314			32		1						1
			VB/T	37	25	21				24		1						
	Industrial Areas	38.1	VF	35	28	5	95			8								
		38.3	VF	12	12		48			12		1						4
		38.4	VF	4	4		16			4								
		38.1	VB/T	26	26	24												
		38.3	VB/T	23	23	20	6			23								
		Total	VF	51	44	5	159			24		1						4
			VB/T	49	49	44	6			23								

(Continued)

ENCLOSURE F

Date	Target	Task Desig.	Type A/C	Total	Attacking Target	Tons Bombs	Rockets	Engaging En. A/C	Dest. by En. A/C	Encountered AA	Character of AA	Dest. by AA	Op. Loss	Engaged VF	Engaged VB/T	Destroyed Air VF	Destroyed Air VB/T	Destroyed Ground
				-- SORTIES --				---------- OWN AIRCRAFT ----------						---- ENEMY AIRCRAFT ----				
15 July	Search & Misc.	38.1	VF	10	10		48			10								
		38.3	VF	38	33	1	108			7								
		38.4	VF	13	7					4								
		38.1	VB/T	10	5					5								
		Total	VF	61	50	1	156			21								
			VB/T	10	5					5								
17 July	Airfields	38.1	VF	34	26	3	76			26								
	Mil. Install.	38.1	VF	27	27	3	88			27			1					
	Transportation Facilities	38.1	VF	11	10	1	16						1					
	Industrial Areas	38.1	VF	24	20	5	74			20								4
18 July	Airfields	38.1	VF	82	72	17	252			72		3						20
		38.3	VF	67	64	13	151			36		1						2
		38.4	VF	34	21		139					2	1					6
		Total		183	157	30	542			108		6	1					28
	Mil. Install.	38.4	VF	11	11	1				11								
		38.1	VB/T	29	25	17	8			25			3					
		38.3	VB/T	13	13	11				13								
		38.4	VB/T	15	13	10				13								
		Total																
		Total	VF	11	11	1				11								
			VB/T	57	51	38	8			51			3					
	Ships & Harbors	38.1	VF	52	52	25				52								
		38.3	VF	48	32	16				32								
		38.4	VF	17	15	8				15								

				-- SORTIES --				---------- OWN AIRCRAFT ----------						---- ENEMY AIRCRAFT ----				
														Engaged		Destroyed in Air		
Date	Target	Task Desig.	Type A/C	Total	Attacking Target	Tons Bombs	Rockets	Engaging En. A/C	Dest. by En. A/C	Encountered AA	Character of AA	Dest. by AA	Op. Loss	VF	VB/T	VF	VB/T	Ground
18 July	Ships & Harbors	38.1	VB/T	59	58	39				58		4	1					
		38.3	VB/T	62	61	32				61		2						
		38.4	VB/T	62	62	30				38		2						
		Total	VF	117	99	49				99								
			VB/T	183	181	71				157		8	1					
	Transportation Facilities	38.1	VF	15	14	2	40			14								
24 July	Airfields	38.1	VF	101	92	23	197			74		5						26
		38.2	VF	119	110	17	238			94		2						1
		38.4	VF	61	59	8	134	1		51				1				7
		Total	VF	281	261	48	669	1		219		7		1				34
	Mil. Install.	38.1	VF	20	20	4	75			20								
		38.3	VF	8	4	2				4								
		38.3	VB/T	9	9	9				9								
		38.4	VB/T	14	14	13				14								
		Total	VF	28	24	6	75			24								
			VB/T	23	23	22				23								
	Ships & Harbors	38.1	VF	147	138	52	247	21	3	138		1		29	1	5	1	
		38.3	VF	137	131	28	260	1		120		3	1	1		1		3
		38.4	VF	50	49	14	12	1	1	27		1	2	1		1		
		38.1	VB/T	175	167	130	16			167		8	2					
		38.3	VB/T	173	168	121				168		6	5					
		38.4	VB/T	120	119	99				67		3	3					
		Total	VF	334	318	94	519	23	4	285		5	3	31	1	7	1	3
			VB/T	468	454	350	16			402		17	10					
	Transportation Facilities	38.1	VF	12	12	1	24			12								

(Continued)

				-- SORTIES --				---------- OWN AIRCRAFT ----------						---- ENEMY AIRCRAFT ----				
														Engaged		Destroyed Air		
Date	Target	Task Desig.	Type A/C	Total	Attacking Target	Tons Bombs	Rockets	Engaging En. A/C	Dest. by En. A/C	Encountered AA	Character of AA	Dest. by AA	Op. Loss	VF	VB/T	VF	VB/T	Ground
24 July	Industrial Areas	38.1	VF	15	13	3	74			13		1						
	Search & Misc.	38.1	VF	26	23	2	93			23		1						2
		38.4	VF	12	2			3				1		1		1		
		Total	VF	38	25	2	93	3		23		2		1		1		2
25 July	Airfields	38.1	VF	129	117	24	389	13	3	95		2	2	15	1	8	1	31
		38.3	VF	79	62	11	153			51		2						2
		38.4	VF	73	69	9	142	3		55		2		1	2	1	2	16
		Total	VF	281	248	44	684	16	3	201		6	2	16	3	9	3	49
	Mil. Install.	38.1	VF	30	20	8	16			16		3						
		38.3	VF	16	14	1	52			14								
		38.1	VB/T	43	28	21	4											
		Total	VF	46	34	9	68			30		3						
			VB/T	43	28	21	4											
	Ships and Harbors	38.1	VF	18	18	6	8			10								
		38.3	VF	79	78	9	225	4		66		2	1	2		2		
		38.4	VF	12	4	1	8			2								
		38.1	VB/T	9	9	6												
		38.4	VB/T	9	9	9												
		Total	VF	109	100	16	241	4		78		2	1	2		2		
			VB/T	18	18	15												
	Transportation Facilities	38.1	VF	6	4	2												
		38.1	VB/T	10	10	4												
		38.4	VB/T	12	12	12												
		Total	VF	6	4	2												
			VB/T	22	22	16												

(Continued)

				-- SORTIES --				---------- OWN AIRCRAFT ----------						---- ENEMY AIRCRAFT ----				
														Destroyed				
														Engaged		Air		
Date	Target	Task Desig.	Type A/C	Total	Attacking Target	Tons Bombs	Rockets	Engaging En. A/C	Dest. by En. A/C	Encountered AA	Character of AA	Dest. by AA	Op. Loss	VF	VB/T	VF	VB/T	Ground
25 July	Industrial Areas	38.1	V	15	15	4	28			8								
		38.1	V/T	1	1	1												
	Search & Misc.	38.1	V	2	2					2								
		38.4	V	4				2					2	2		1		
		Total	V	6	2			2		2			2	2		1		
26 July	Airfields	38.1	V	128	114	24	407					1	1					59
		38.3	V	159	144	24	529	17		100		1		19		17		16
		38.4	V	115	110	15	426	1		94		3		1		1		39
		Total	V	402	368	63	1,362	18		194		5	1	20		18		114
	Mil. Install.	38.1	V/T	23	20	19				20								
	Ships & Harbors	38.1	V	113	98	38	83			98		3						
		38.3	V	128	117	36	156			79		3						
		38.4	V	89	86	33	28			74		1						
		38.1	V/T	139	128	98	44			128		6						
		38.3	V/T	184	173	124				142		1	4					
		38.4	V/T	165	162	120	24			129		9	2					
		Total	V	330	301	107	267			251		7						
			V/T	488	463	242	68			399		16	6					
	Transportation Facilities	38.4	V	10	10	2												1
	Industrial Areas	38.4	V	21	21	4	94	4						4		4		5
	Search & Misc.	38.4	V	8	4	2				4								

(Continued)

Date	Target	Task Desig	Type A/C	-- SORTIES -- Total	Attacking Target	Tons Bombs	Rockets	OWN AIRCRAFT Engaging En. A/C	Dest. by En. A/C	Encountered AA	Character of AA	Dest. by AA	Op. Loss	ENEMY AIRCRAFT Engaged VF	Engaged VB/T	Destroyed Air VF	Destroyed Air VB/T	Ground
29 July	Airfields	38.4	VB/T	8	8	1	14			8								
30 July	Airfields	38.1	VF	216	201	42	644			181		8						52
		38.3	VF	230	208	42	450			155		1	3					10
		38.4	VF	59	52	13	160			40		1						7
		38.1	VB/T	115	111	52	156			101		1						15
		38.4	VB/T	88	88	72				65								
		Total	VF	505	461	97	1,454			376		10	3					69
			VB/T	203	199	124	156			166		1						15
	Mil. Install.	38.4	VF	20	20	1	19			20								
	Ships & Harbors	38.4	VF	81	82	16	284			62		1						1
		38.4	VB/T	78	77	65				56		2						
	Industrial Areas	38.1	VF	36	31	6	188			31								3
		38.3	VF	61	57	16	120	1		26			1		1			
		38.4	VF	34	32	6	76			10		1						
		38.3	VB/T	33	33	15				18								
		38.4	VB/T	29	29	17				29								
		Total	VF	131	120	28	384	1		67		1	1		1			3
			VB/T	62	62	32				47								
9 August	Airfields	38.1	F	161	140	33	563			132		4	1					156
		38.3	F	214	189	84	53			142		1	2					31
		38.4	F	216	203	23	949	2		181			1	1		1		73
		38.1	B/T	118	113	88	60			113		1	1					26
		38.3	B/T	135	135	129				100			2					7
		38.4	VB/T	179	167	113				152		1	1					
		Total	F	591	532	140	1,565	2		455		5	4	1		1		260
			VB/T	432	415	330	60			365		2	4					33

(Continued)

				- - SORTIES - -				- - - - - - - - - - OWN AIRCRAFT - - - - - - - - - -						- - - - ENEMY AIRCRAFT - - - -				
														Destroyed				
														Engaged		Air		
Date	Target	Task Desig.	Type A/C	Total	Attacking Target	Tons Bombs	Rockets	Engaging En. A/C	Dest. by En. A/C	Encountered AA	Character of AA	Dest. by AA	Op. Loss	VF	VB/T	VF	VB/T	Ground
9 August	Mil. Install.	38.4	VF	12	12	3	48											
	Ships & Harbors	38.1	VF	31	31	8	142			23								
		38.3	VF	83	77	25	127			49		1						
		38.1	VB/T	69	66	54	76			66								
		38.3	VB/T	50	49	24				35		3						
		Total	VF	114	108	33	269			72		1						
			VB/T	119	115	78	76			101		3						
	Transportation Facilities	38.4	VF	12	12		72			12								
	Industrial Areas	38.3	VF	16	16	6				16								
		38.4	VF	23	17		80			17								
		Total	VF	39	33	6	80			33								
	Search & Misc.	38.1	VF	4	4													
10 August	Airfields	38.1	VF	75	74	17	252			53			1					50
		38.3	VF	69	65	21	128			65		3						3
		38.4	VF	152	152	11	737			121		3						31
		38.1	VB/T	72	71	57	16			63		1						53
		38.4	VB/T	140	139	108				117								26
		Total	VF	296	291	49	1,117			239		6	1					84
			VB/T	213	210	165	16			180		1						79
	Mil. Install.	38.1	VF	12	12	2	38											
		38.3	VF	16	15	3	74			15								9
		38.4	VF	10	5		10			5								

(Continued)

				- - SORTIES - -				- - - - - - - - - - OWN AIRCRAFT - - - - - - - - - -						- - - - ENEMY AIRCRAFT - - - -				
														Engaged		Destroyed Air		
Date.	Target	Task Desig.	Type A/C	Total	Attacking Target	Tons Bombs	Rockets	Engaging En. A/C	Dest. by En. A/C	Encountered AA	Character of AA	Dest. by AA	Op. Loss	VF	VB/T	VF	VB/T	Ground
10 August	Mil. Install.	38.1	VB/T	12	12	6	28											
		38.3	VB/T	37	37	31				37								
		38.4	VB/T	12	12	11				12								2
		Total	VF	38	32	5	122			20								9
			VB/T	61	61	48	28			49								2
	Ships & Harbors	38.1	VF	133	121	22	564			64								63
		38.3	VF	131	127	26	406			86		2						8
		38.4	VF	89	72	7	348			72		2						6
		38.1	VB/T	44	43	30				43			1					
		38.3	VB/T	92	90	77				47			1					
		38.4	VB/T	19	19	14				8								
		Total	VF	353	320	55	1,318			222		4						77
			VB/T	155	152	121				98			2					
	Transportation Facilities	38.1	VF	21	20	5	92			16								
		38.3	VF	28	24	6	84			24								
		38.1	VB/T	22	22	11	48			22								
		38.3	VB/T	23	23	17				23								
		38.4	VB/T	9	9	9				9								
		Total	VF	49	44	11	176			40								
			VB/T	54	54	37	48			54								
	Industrial Areas	38.1	VF	23	20	6	64											
		38.3	VF	23	23	4	87			8								
		38.1	VB/T	8	8	8												
		38.4	VB/T	11	11	6												
		Total	VF	46	43	10	151			8								
			VB/T	19	19	14												
	Search & Misc.	38.4	VF	4														

(Continued)

	Fac ion ies	38.1	VF	8	8	2	40			13								
	Industrial Areas	38.1	VF	89	85	35	92			13								
		38.3	VF	60	44	13	82			8								
		38.1	VB/T	77	76	63	4			85		2						36
		38.3	VB/T	36	35	29				44		1						
		Total	VF	149	129	48	174			76		1						4
			VB/T	113	111	92	4			35	1							
14 August	General	38.1	VF	4				4		129								
										111		2						
											1							

(Continued)

Strike mission with no specified target.

TOTAL OFFENSIVE

Airfields	VF	4,209	3,839	758	11,704	45	7	3,016	64	16	55	5	33	4	[illegible]			
	VB/T	1,416	1,381	1,008	309			1,132	10	7					180			
Mil. Install.	VF	382	341	48	952			233	5	2					9			
	VB/T	381	343	265	80			253		7					2			
Ships & Harbors	VF	1,778	1,650	427	3,899	27	4	1,332	24	7	33	1	9	1	84			
	VB/T	1,930	1,872	1,270	180			1,504	54	26								
Transportation Facilities	VF	256	236	28	913			146	1	1					45			
	VB/T	151	139	107	48			92	1									
Industrial Areas	VF	508	455	113	1,302	5		319	3	3	4	1	4		20			
	VB/T	298	296	215	57			225	2									
Search & Miscellaneous	VF	152	100	5	296	9		54	3	2	18		8		2			
	VB/T	10	5					5										
General	VF	28				11			1		29		11					
Total	VF	7,313	6,621	1,379	19,066	97	11	5,100	101	31	139	7	65	5	1,240			
	VB/T	4,186	4,036	2,865	674			3,211	67	40					182			
Grand Total		11,499	10,657	4,244	19,740	97	11	8,311	168	71	139	7	65	5	1,422			

24 July	Local Defense	38.3	VF	28																
	Target CAP	38.1	VF	24	22		61	11												
		38.4	VF	16	12		24													
25 July	Local Defense	38.3	VF	12				1												
		38.4	VF	14																
	Target CAP	38.1	VF	28	24			2												
		38.4	VF	4	4	2	72	2												
26 July	Local Defense	38.3	VF	12			18													
	Target CAP	38.1	VF	20	20			3												
		38.4	VF	8	8		56													
							14													

(Continued)

	Target CAP	38.3	VF	8	4		16													
		38.4	VF	12	12		44													
14 August	Local Defense	38.1	VF	4				4								20		7		
15 August	Local Defense	38.1	VF	16	4			7									2		2	
		38.4	VF	23				7			1					5	2	4	2	

TOTAL DEFENSIVE

Local Defense	VF	234	10		12	96	6	1	1	37	29	25	27			
Target CAP	VF	301	258	8	738	7	146	5		2	1	2	1	4		
Total		535	268	8	750	103	152	6	1	39	30	25	28	4		

* A total of 5,408 CAP sorties were reported by CTF 38 for this period.

FAST CARRIER FORCES IN THE ASSAULT ON JAPAN

NIGHT ACTION

10 July - 15 August 1945

Date	Target	Task Desig.	Type A/C	-- SORTIES -- Total	Attacking Target	Tons Bombs	Rockets	------- OWN AIRCRAFT ------- Engaging En. A/C	Dest. by En. A/C	Encountered AA	Dest. by AA	Op. Loss	---- ENEMY AIRCRAFT ---- Engaged VF	Engaged VB/T	Destroyed Air VF	Destroyed Air VB/T	Ground
17 July	Airfields	38.1	VF	2	2		6					1					
			VT	2	2												
24 July	Shipping	38.1	VT	3	3	2	9			3	1						
25 July	Shipping	38.1	VT	3	2	1	7			2	1						
	Mil. Install.	38.1	VT	4	4												
30 July	Airfields	38.1	VT	2	2	2	8			2							
31 July	Airfields	38.1	VT	2	2	2	8			2							
9 August	Other	38.1	VF	8				1						2		1	
13 August	Other	38.1	VF	2				2					3	3	3	2	
							TOTAL NIGHT ACTION										
	Airfields		VF	2	2		6										
			VT	6	6	4	16			4							
	Shipping		VT	6	5	3	16			5	2						
	Mil. Install.		VT	4	4												
	Other		VF	10				3					3	5	3	3	
	Total		VF	12	2		6	3				1	3	5	3	3	
			VT	16	15	7	32			9	2						

ENCLOSURE F

TOTAL AIR ACTION BY FAST CARRIER FORCES IN ASSAULT ON JAPAN

10 July - 15 August 1945

Date	Target	Task Desig.	Type A/C	-- SORTIES -- Total	Attacking Target	Tons Bombs	Rockets	OWN AIRCRAFT: Engaging En. A/C	Dest. by En. A/C	Encountered AA	Character of AA	Dest. by AA	Op. Loss	ENEMY AIRCRAFT: Engaged VF	Engaged VB/T	Destroyed Air VF	Destroyed Air VB/T	Destroyed Ground
OFFENSIVE ACTION																		
			VF	7,313	6,621	1,379	19,066	97	11	5,100		101	31	139	7	65	5	1,240
			VB/T	4,186	4,036	2,865	674			3,211		67	40					182
DEFENSIVE ACTION																		
			VF	535	268	8	750	103		152		6	1	39	30	25	28	4
NIGHT ACTION																		
			VF	12	2		6	3					1	3	5	3	3	
			VT	16	15	7	32			9		2						
TOTAL ACTION																		
			VF	7,860	6,891	1,387	19,822	203	11	5,252		107	33	181	42	93	36	1,244
			VB/T	4,202	4,051	2,872	706			3,220		69	40					182
			TOTAL	12,062	10,942	4,259	20,528	203	11	8,472		176	73	181	42	93	36	1,426

WSEG STAFF STUDY NO. 4

ENCLOSURE G

AIRCRAFT PERFORMANCE CHARACTERISTICS

STATISTICAL INFORMATION ON
ON WORLD WAR II CARRIER EXPERIENCE

Special Study - Aircraft Performance Characteristics

The study shows performance data for principal United States and Japanese combat aircraft and the results of aerial combat between them.

Aircraft are compared in terms of range, speed, rate of climb, bomb load, size, armament, and armor. Since the most important factor in combat is the best an aircraft can do, the highest performance for which data was available is shown in the tables. For bombers, best performance is given while carrying a normal bomb load.

Characteristics of Principal U.S. Navy and Japanese Fighters

FM-1 was the Eastern Aircraft Division and General Motors Corp. version of the Grumman F4F-4. It differed from the F4F-4 in that it carried 4 instead of 6-.50 cal. guns.

F4F-4 and FM-1 bomb loading is taken from August 1942 data. For later planes of this type, bomb load data is not available.

Tojo pilot and fuel protection ineffective against .50 cal. fire.

Speed and Rate of Climb given with War Emergency Power except for FM-1, F4U-1, F6F-3, Zeke and Tony which are given with Military Power.

Characteristics of Principal U.S. Navy and Japanese Bombers -

SBD-5 maximum bomber range is given with 1-500 pound bomb and 2 external fuel tanks. Speed and rate of climb data given with 1,000 pound bomb load.

SB2C-4 speed and rate of climb given without bomb load.

TBM-3 is the Eastern Aircraft Division of General Motors Corp. version of the Grumman TBF.

Speed and Rate of Climb for SBD-5, SB2C-1, TBF-1, TBM-3, Val and Jill are given with Military Power.

Aerial Combat Results

Given for the last 12 months of the war. Figures in the left hand column for each U.S. plane type are the enemy planes it destroyed in combat; figures in the right hand column are own planes lost in combat with each enemy plane.

Twenty-seven F6F's and 11 F4U's shot down by unidentified fighters, and 14 F6F's lost to unknown types have been arbitrarily prorated among the various single engine enemy fighters.

Data for SBD not available.

Aerial Combat Data

Shows, for the same period as used in "Aerial Combat Results," the total number of aircraft involved in aerial combat.

Sources

Performance characteristics of U.S. Navy aircraft were taken from "U.S. Navy Service Airplane Characteristics and Performance Data Sheets" issued by the Bureau of Aeronautics, and for Japanese aircraft from Technical Aircraft Intelligence Center reports. Aerial combat data was taken from IBM tabulations of squadron reports compiled in the Office of Naval Intelligence.

Prepared by

AVIATION HISTORY SECTION, DCNO(AIR)

October 1950

CHARACTERISTICS OF PRINCIPAL U. S. NAVY AND JAPANESE FIGHTERS

	FM-1 F4F-4	FM-2	F4U-1	F4U-1D	F6F-3	F6F-5	ZEKE-32 (Hamp) (Navy)	OSCAR-2 (Army)	TONY-1 (Army)	TOJO-2 (Army)	GEORGE-11 (Navy)	FRANK-1 (Army)
Date of Report	1 July 43	1 Sept 44	1 Aug 43	1 Aug 45	1 July 43	1 Nov 44	Dec 44	May 45	Dec 44	March 45	May 45	March 45
Maximum Range	1,275	1,310	1,735	1,500	1,620	1,650	1,435	1,885	2,010	1,050	1,730	1,815
Combat Radius	374	305	420	397	427	449						
V-Max at Sea Level (mph)	284	307	341	358	324	344	284	291	302	335	358	363
V-Max at 10,000 ft	310	325	360	383	344	371	324	324	340	360	385	389
V-Max at 20,000 ft	317	331	383	408	366	382	343	331	353	379	415	427
Best V-Max	320	332	395	409	376	386	346	333	361	383	416	427
At Critical Altitude(ft)	18,800	20,800	23,000	19,900	22,800	17,400	21,000	19,100	15,800	17,400	19,000	20,000
R/C at Sea Level (fpm)	2,470	3,650	2,830	3,380	2,900	3,250	2,960	3,260	2,440	4,140	4,060	4,140
R/C at 10,000 ft	2,130	2,810	2,370	2,930	2,360	2,880	3,100	3,060	2,500	3,500	3,400	3,280
R/C at 20,000 ft	1,200	1,730	1,940	2,230	1,940	2,010	2,600	2,280	1,790	2,710	2,910	3,130
Service Ceiling (ft)	34,000	34,700	38,000	40,000	38,400	37,300	39,800	35,900	35,100	36,350	39,100	38,800
Engine Take Off H. P.	1,200	1,350	2,000	2,000	2,000	2,000	1,115	1,065	1,160	1,500	1,970	1,970
Number of Engines	1	1	1	1	1	1	1	1	1	1	1	1
Wing Span (ft)	38.0	38.0	41.0	41.0	42.8	42.8	36.2	35.6	39.3	31.0	39.4	37.1
Length (ft)	29.0	29.0	32.8	32.9	33.3	33.3	29.8	29.2	28.9	29.2	29.5	32.3
Normal Gross Weight (lbs)	7,975	7,487	11,149	12,175	11,381	12,500	5,650	5,500	6,982	6,100	9,018	7,940
Armament												
Guns	6-.50 cal	4-.50 cal	6-.50 cal	6-.50 cal	6-.50cal	6-.50cal	2-20mm	2-12.7mm	2-12.7mm	2-7.7 or 12.7	2-7.7mm	2-12.7mm

CHARACTERISTICS OF PRINCIPAL U. S. NAVY AND JAPANESE FIGHTERS (Continued)

	FM-1 F4F-4	FM-2	F4U-1	F4U-1D	F6F-3	F6F-5	ZEKE-32 (Hamp) (Navy)	OSCAR-2 (Army)	TONY-1 (Army)	TOJO-2 (Army)	GEORGE-11 (Navy)	FRANK-1 (Army)
Date of Report	1 July 43	1 Sept 44	1 Aug 43	1 Aug 45	1 July 43	1 Nov 44	Dec 44	May 45	Dec 44	March 45	May 45	March 45
Armament (continued)												
Rounds/Gun Guns	240	430	200	400	200	400	60 2-7.7mm	250	2-12.7or 20mm	250 or 500 2-12.7 or 40mm	500 4-20mm	350 2-20mm
Rounds/Gun Bombs (lbs) Rockets	2-100	2-250 6-5"		2-1000 8-5"		2-1000 6-5"	500 2-132	2-220	2-220	250 or 10 None	220 2-132	150 2-66
Armor												
Pilot	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes
Fuel	yes	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes

CHARACTERISTICS OF PRINCIPAL U. S. NAVY AND JAPANESE BOMBERS

		SBD-5 Dive Bomber	SB2C-1 Dive Bomber	SB2C-4 Dive Bomber	TBF-1 Torpedo Bomber	TBM-3 Torpedo Bomber	VAL-22 Dive Bomber (Navy)	JUDY-11 Dive Bomber (Navy)	KATE-12 Torpedo Bomber (Navy)	JILL-12 Torpedo Bomber (Navy)	BETTY-11 Bomber (Navy)	FRANCES-11 Torpedo Bomber (Navy)
Date of Report		June 44	Sept 43	1 Nov 44	July 43	Jan 44	Dec 44	March 45	Dec 44	May 45	May 45	May 45
Maximum Scout Range		1,565	1,895	1,920	2,335	2,530	1,580	Not Avail	2,240	2,010	3,250	3,737
Scout Radius		460	570	574	742	788						
Maximum Bomber Range		1,345	1,430	1,420	1,390	1,665	1,530	2,580		1,740	3,075	3,250
Combat Radius		483	431	431	391	472						
Normal Bomber Range		1,280	1,110	1,430	1,105	1,130	965	1,155	1,665		1,170	2,430
Combat Radius		276	289	305	259	242						
Performance Normal Bomber												
V-Max at Sea Level	(mph)	238	265	270	249	252	230	302	202	264	257	325
V-Max at 10,000 ft		243	275	277	250	257	263	327	227	295	271	340
V-Max at 20,000 ft		233	259	278	224	248	277	328	215	290	271	361
Best V-Max		252	281	295	257	267	284	339	232	300	283	367
At Critical Altitude	(ft)	13,800	12,400	16,700	12,000	14,800	21,600	13,600	12,000	16,200	13,800	17,200
R/C at Sea Level	(fpm)	1,700	1,750	1,800	1,180	1,170	1,980	2,720	1,390	1,720	1,760	2,500
R/C at 10,000 ft		1,170	996	1,280	1,120	690	2,110	2,490	1,500	1,580	1,370	1,990
R/C at 20,000 ft		450	398	810	190	300	1,780	1,610	600	910	900	1,610
Service Ceiling	(ft)	26,100	25,900	29,100	23,600	25,300	33,600	33,100	24,000	35,400	30,400	35,530
Engine Take Off H.P.		1,200	1,700	1,900	1,700	1,800	1,280	1,185	985	1,820	1,820	1,795
Number of Engines		1	1	1	1	1	1	1	1	1	2	2
Wing Span	(ft)	41.5	49.7	49.7	54.2	54.2	47.5	37.8	50.9	49.0	82	65.6
Length	(ft)	32.5	36.8	36.8	40.8	40.8	35.4	33.6	34.2	36.1	64.5	49.2
Normal Gross Weight	(lbs)	10,403	14,720	15,189	16,412	16,761	8,380	8,059	8,731	11,470	27,570	23,150
Armament												
Forward Guns		2-.50 cal	2-20 mm	2-20 mm	2-.50 cal	2-.50 cal	2-7.7 mm	2-7.7 mm	2-7.7 mm	1-7.7 or 1-20 mm	1-7.7 mm	1-20 mm
Rounds/Gun		180	200	200	200	300	791	791	600	582	679	90
Gun											1-7.7 mm	
Rounds/Gun											1	
Top Guns		2-.30 cal	2-.30 cal	2-.30 cal	1-.50 cal	1-.50 cal	1-7.7 mm	1-7.7 mm	1-7.7 mm		1-20 mm	1-20 mm
Rounds/Gun		1,000	1,000	1,000	200	400	1,000	1,000	300		270	150
Side Guns											2-7.7 mm	
Rounds/Gun											582	
Tail or Bottom Guns					1-.30 cal	1-.30 cal				1-7.7 mm	1-20 mm	
Rounds/Gun					500	500				485	270	
Bomb Load - Normal	(lbs)	1-1000	1-1000	1-1000	1 Torpedo	1 Torpedo	-	1-550	1-1760	1-3250	1-2200	1-1875
Bomb Load - Maximum	(lbs)	1-1600	2-1000	2-1000	4-500	2-1000		1-1100				
Rockets		6 - 5"		6 - 5"		6 - 5"						
Armor												
Pilot		Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	No	Yes
Fuel		Yes	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes
Radar		Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Crew		2	2	2	3	3	2	2	3	3	5-7	3

AERIAL COMBAT RESULTS
INDIVIDUAL MODELS OF OWN VS JAPANESE AIRCRAFT

1 September 1944 - 15 August 1945

FIGHTERS	F6F		F4U-FG		FM		Total Navy Fighter		SB2C		TBM		Total Navy VT/B		VPB		Grand Total	
Zeke (Hamp)	1,000	75	327	27	87	2	1,414	104	7	5	10	3	17	8	27	6	1,458	118
Oscar	396	26	45	1	38	3	480	30	8		6	1	14	1	17	2	511	33
Tony	275	11	60	2	29		364	13		1	4	1	4	2	6	2	374	17
Tojo	283	9	53	4	17	2	353	15	3		3		6		10		369	15
Frank	114	12	28	4			142	16	1				1		1		144	16
George	28		7				35										35	
Other	218	16	113	4	12		343	20		2	2	3	2	5	13	7	358	32
Total	2,314	149	634	42	183	7	3,131	198	19	8	25	8	44	16	74	17	3,249	231
S. E. BOMBERS																		
Val	215		187	2	88		490	2			5		5		14		509	2
Judy	134	1	36	1	5		175	2							1		176	2
Kate	26		13		4		43		1				1		10		54	
Jill	105		23		7		135								5		140	
Other	35	1	12		1		48	1							2		50	1
Total	515	2	271	3	105		891	5	1		5		6		32		929	5
T. B. BOMBERS																		
Betty	185	6	29	1	2		216	7	2		1		3		14		233	7
Frances	115		7		16		143								1		144	
Other	227	2	62	1	61	1	350	4	8		1		9		16		375	4
Total	530	8	98	2	81	1	709	11	10		2		12		31		752	1
OTHER TYPES *	159	1	39	2	8	1	206	4	3	2	6	2	9	4	89	2	304	10
GRAND TOTAL	3,518	160	1,042	49	377	9	4,937	218	33	10	38	10	71	20	226	19	5,234	257

* Includes float planes, flying boats, transports, trainers, and unidentified aircraft

AERIAL COMBAT DATA

1 September 1944 - 15 August 1945

Carrier-Based		OWN AIRCRAFT			ENEMY AIRCRAFT			
		Engaging Enemy A/C	Lost	Damaged	Engaged		Destroyed	
					Bombers	Fighters	Bombers	Fighters
1944	September	578	13	37	88	669	46	327
	October	1,572	74	105	617	1,645	409	780
	November	483	11	18	61	483	49	223
	December	154	2	3	31	114	25	86
1945	January	486	10	21	85	287	74	169
	February	950	40	64	73	1,184	50	382
	March	630	32	25	147	574	106	243
	April	1,185	18	30	474	958	431	618
	May	363	5	7	77	415	59	219
	June	113	4	0	2	114	1	20
	July	109	7	7	17	86	15	47
	August	115	4	5	33	78	27	38
Total Carrier-Based		6,738	220	322	1,705	6,607	1,292	3,152
Total Land-Based		1,091	39	95	427	1,163	331	459
GRAND TOTAL		7,829	259	417	2,132	7,770	1,623	3,611

CHARACTERISTICS OF PRINCIPAL U. S. NAVY AND JAPANESE FIGHTERS

	FM-1 F4F-4	FM-2	F4U-1	F4U-1D	F6F-3	F6F-5	ZEKE-32 (Hamp) (Navy)	OSCAR-2 (Army)	TONY-1 (Army)	TOJO-2 (Army)	GEORGE-11 (Navy)	FRANK-1 (Army)
Date of Report	1 July 43	1 Sept 44	1 Aug 43	1 Aug 45	1 July 43	1 Nov 44	Dec 44	May 45	Dec 44	March 45	May 45	March 45
Maximum Range	1,275	1,310	1,735	1,500	1,620	1,650	1,435	1,885	2,010	1,050	1,730	1,815
Combat Radius	374	305	420	397	427	449						
V-Max at Sea Level (mph)	284	307	341	358	324	344	284	291	302	335	358	363
V-Max at 10,000 ft	310	325	360	383	344	371	324	324	340	360	385	389
V-Max at 20,000 ft	317	331	383	408	366	382	343	331	353	379	415	427
Best V-Max	320	332	395	409	376	386	346	333	361	383	416	427
At Critical Altitude(ft)	18,800	20,800	23,000	19,900	22,800	17,400	21,000	19,100	15,800	17,400	19,000	20,000
R/C at Sea Level (fpm)	2,470	3,650	2,830	3,380	2,900	3,250	2,960	3,260	2,440	4,140	4,060	4,140
R/C at 10,000 ft	2,130	2,810	2,370	2,930	2,360	2,880	3,100	3,060	2,500	3,500	3,400	3,280
R/C at 20,000 ft	1,200	1,730	1,940	2,230	1,940	2,010	2,600	2,280	1,790	2,710	2,910	3,130
Service Ceiling (ft)	34,000	34,700	38,000	40,000	38,400	37,300	39,800	35,900	35,100	36,350	39,100	38,800
Engine Take Off H. P.	1,200	1,350	2,000	2,000	2,000	2,000	1,115	1,065	1,160	1,500	1,970	1,970
Number of Engines	1	1	1	1	1	1	1	1	1	1	1	1
Wing Span (ft)	38.0	38.0	41.0	41.0	42.8	42.8	36.2	35.6	39.3	31.0	39.4	37.1
Length (ft)	29.0	29.0	32.8	32.9	33.3	33.3	29.8	29.2	28.9	29.2	29.5	32.3
Normal Gross Weight (lbs)	7,975	7,487	11,149	12,175	11,381	12,500	5,650	5,500	6,982	6,100	9,018	7,940
Armament												
Guns	6-.50 cal	4-.50 cal	6-.50 cal	6-.50 cal	6-.50cal	6-.50cal	2-20mm	2-12.7mm	2-12.7mm	2-7.7 or 12.7	2-7.7mm	2-12.7mm

ASSIGNMENT OF CARRIER TYPE COMBAT AIRCRAFT
1942

	January		February		March		April		May		June	
	VF	VB/T	VF	VB/T	VF	VB/T	VF	VB/T	VF	VB/T	VF	VB/T
Total On Hand	537	776	596	757	629	784	710	849	793	927	831	888
On Board Operational Carriers	120	321	107	312	85	239	211	284	244	289	168	258
In CTF or Assault	58	250	53	241	17	157	162	251	116	258	147	258
ASW	62	71	54	71	62	82	43	33	28	31		
Shakedown & Training					6		6				21	
Other												
In Carrier Squadrons Ashore	46		50	1	87	46	70	53	104	46	104	12
In Other Aviation Activities	371	455	439	444	457	499	429	512	545	592	559	618
Marine Corps	36	86	37	80	75	68	109	57	146	121	124	104
Training Command	46	84	33	82	71	137	98	117	125	128	116	113
Other Shore Activities	289	285	369	282	311	294	222	338	274	343	319	401
In Logistic Support	247	143	260	50	205	177	231	173	238	243	299	305
Repair and Overhaul	144	146	136	40	85	117	88	83	57	76	72	113
Pools	38		45	1	64	18	51	11	74	76	105	67
In Delivery	65	2	27	9	56	42	92	79	107	96	122	125

	July		August		September		October		November		December	
Total On Hand	781	875	813	989	870	1,100	1,015	1,271	1,064	1,421	1,253	1,575
On Board Operational Carriers	125	261	186	257	163	124	146	224	137	166	197	182
In CTF or Assault	113	261	129	255	90	72	86	160	77	123	87	94
ASW							11	17	9	14	29	33
Shakedown & Training	6		56	2	73	52	42	31	11	6	81	55
Other	6						7	16	40	23		
In Carrier Squadrons Ashore	207	35	188	120	147	277	185	206	110	182	107	192
In Other Aviation Activities	449	579	440	612	560	699	684	841	817	1,073	949	1,201
Marine Corps	128	113	176	118	208	188	211	210	149	186	139	191
Training Command	47	117	43	135	96	167	146	214	157	331	202	271
Other Shore Activities	274	349	221	359	256	344	327	417	511	556	608	739
In Logistic Support	249	359	229	335	278	296	387	383	539	512	604	647
Repair and Overhaul	74	114	104	108	139	108	173	138	163	132	125	167
Pools	109	116	71	87	53	73	114	122	160	162	150	141
In Delivery	66	129	54	140	86	115	100	123	216	218	329	339