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17 JUNE 1946

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NAVAL AVIATION COMBAT STATISTICS

WORLD WAR II

AIR BRANCH
OFFICE OF NAVAL INTELLIGENCE
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
NAVY DEPARTMENT
WASHINGTON, D. C.

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-05	5	First Marine AirWing	1
-50	5	Second Marine AirWing	1
-51	1	Fourth Marine AirWing	1
-511	5	ComCarDivs 1,2,3,4,5,6,7,14,15,17,19	1 each
-513	1	Fleet AirWings 1,2,3,4,5,8,10,11, 14,18	2 each
-514	1	ANTIETAM	1
-514H	1	BOXER	1
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NAVAL AVIATION COMBAT STATISTICS
WORLD WAR II

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EVALUATION SECTION
AIR BRANCHNAVAL AVIATION COMBAT STATISTICS,
WORLD WAR II.GENERAL INTRODUCTION1. GENERAL SCOPE OF REPORT

This report contains air combat, attack, and combat operations statistics of Naval and Marine aviation during the war. It is designed as a basic reference document, compressing into one volume the most pertinent statistical data compiled in the IBM tabulation system maintained by Air Branch, ONI, and its predecessors, Air Intelligence Group, ONI, and Air Technical Analysis Division, DCNO(Air). Certain related data from other sources, compiled on statistical bases comparable to those used in the Op-23-V tabulation system, have been added.

The 60 statistical tables herein are supplemented by an interpretive text, tied closely to the data presented. In no sense is any attempt made in this text to present a connected narrative account of the war record of Naval aviation. The essence of the report is combat statistics, and the story is told solely as the statistics themselves may be led to tell it. The story told is also limited to the overall story, a perspective of Naval aviation and its many components as a whole, and data for individual ships, squadrons or other units are not provided.

2. DATA NOT INCLUDED

Not all the story of Naval aviation, which could be told in statistical terms, is covered in this report. The reasons for the omissions arise from the history and assigned functions of the statistical unit preparing the data, and from the lack of any integrated statistical organization covering all naval air operations. Postwar personnel shortages prevented this Branch from making good these deficiencies.

Naval air anti-submarine warfare is the first exclusion. This results from the establishment, many months prior to initiation of the general air combat statistical analysis program, of a special ASW statistical analysis unit, (directly under CominCh, and later under Tenth Fleet). To avoid duplication of a field well covered elsewhere, no records of air ASW activity were kept by this Branch or its predecessors.

The second principal exclusion is complete, detailed data on flights not involving actual action with the enemy (for search, reconnaissance, defensive, or other purposes), and losses sustained on such flights. This arose from (a) the prior existence of another office (Flight Statistics, DCNO(Air)) primarily concerned with data on non-action flights, (b) the primary importance of devoting the limited manpower and facilities available to the analysis of action statistics not compiled elsewhere and (c) a lack of complete, uniform and detailed incoming reports on non-action flights. This exclusion has been partly compensated by including in some tables herein data on total flights reported monthly (for 1944-45 only) by squadrons which were engaged in action during any month, and non-action losses by such squadrons during the entire war.

These items, however, do not give a full picture of the extent of naval air defensive or reconnaissance patrol activity or losses sustained therein. It is doubtful whether data exist which would permit a full and accurate statistical presentation of this activity.

A further exclusion is data on the operations of VO-VS aircraft. These operations were not regularly reported by the units involved, in a manner permitting their tabulation by the IBM card system.

The final major exclusion is data on losses of flying personnel. Losses as reported in action reports are not final, because of subsequent rescues, or return of captured airmen. Data on these is maintained by BuPers, but is not compiled and reported on a basis comparable with the aircraft loss data herein.

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NOTE

3. SCOPE OF THE DATA

Despite the exclusions listed, the bulk of Naval aviation's achievements, at least in the Pacific war, are covered by the data herein. Included are full data on all reported aerial combat, and all reported attacks on enemy targets other than submarines, by all Navy and Marine carrier and land-based aircraft. The following general categories of figures are provided;

Total Flights, by squadrons reporting action against the enemy

Action Sorties

Losses and damage from enemy action

Losses from operational causes

Own planes engaging enemy aircraft

Enemy aircraft engaged

Enemy aircraft destroyed, air and ground

Planes attacking targets

Bomb and torpedo expenditures on targets

Rocket expenditures

Ammunition expenditures.

And, with respect to each of the above items, one or more of the following cross-classifications of data are provided;

- Carrier-based vs. land-based
- Type of carrier
- Navy vs. Marine
- Theater of operation
- Year, month
- Carrier raid or campaign
- Type or model of own aircraft
- Type or model of enemy aircraft
- Mission of own aircraft
- Location of action, by general areas
- Type of target attacked
- Type of ordnance used
- Night operations.

4. SOURCES AND METHODS

The method used in compiling these data deserves brief description. The basic source material for most actions was the squadron ACA-1 report for each mission, or the individual squadron or mission action report for actions prior to adoption of the ACA-1 form. Where no action reports were available, carrier battle narratives or squadron monthly war diaries were used. A check list of all carriers and squadrons in combat areas was maintained, and the war diaries of all such squadrons, and battle narratives of all such ships, were checked for possible actions in the event that no action reports had been received from any of these units.

The statistical items from these primary and secondary sources were then punched on IBM cards. The mechanical unit, for card-punching purposes, was the action of one squadron on one mission. From the file of these cards, numbering some 48,300 in all, have come most of the tabulations and cross-tabulations in this report. Additional supplementary files of summary cards, some 5,500 in number, prepared from the main card file, have also been used in preparing some of the tables.

Statistical tabulation was begun in early 1944, starting with the air operations of January 1944 and following with those of subsequent months in order. For 1944 operations a card system was used which required filling out not only one card covering each squadron on each mission, but also supplementary cards covering each separate engagement with enemy aircraft, and each separate attack on a major type of target, in addition to the primary engagement or attack participated in by the squadron.

This system was eventually found unwieldy for handling the large-scale operations of late 1944, and beginning with the operations of January 1945 a simplified card system was used in which all engagements and attacks by one squadron on one mission were covered on one card. The change of card coding systems resulted in some lack of comparability between 1944 and 1945 statistics (discussed in connection with individual items under appropriate headings hereafter), and in an inability to secure certain breakdowns of data for one year or the other. This will explain the limitation of some tables to 1944 only, or 1945 only.

Because of time and personnel limitations, 1942-43 actions were not placed on machine cards until after the end of the war, and the simplified 1945 coding system was therefore used for these years.

Of the data appearing in the tables, all were taken from the IBM cards except the following, whose origin is described briefly:

(a) Aircraft on hand, and total flights, for squadrons in action;

These figures, on a monthly basis, were obtained from Flight Statistics Section, DCNO(Air), from the monthly report of each squadron which reported engaging in action against the enemy (other than ASW) during the month. Data were not obtained for squadrons which reported no action during a given month, even if they were in action during the preceding or following month and were known to have been in an active area. Thus these figures are not complete records of plane strength, patrols or other flights in war areas, but are, as the name implies, figures for squadrons in action, directly comparable with the action data on a squadron basis. Where number of flights was not reported, or was obviously incorrect as reported, an estimate was made, based on the performance of comparable units, and the squadron's combat activity. Where number of planes reported on hand differed excessively from normal strength and was also out of line with the number of flights and action sorties reported, normal complement was substituted. These figures are given for 1944-45 only, as they were not available on a monthly basis for earlier years.

(b) Losses on other (non-action) flights, and losses on ship or ground;

These figures were obtained from Aircraft Records Section, DCNO(Air), and also cover, on a monthly basis, only squadrons reporting action during the month of the loss. Thus they would not cover losses on negative patrols by units flying no action sorties, nor even losses on the ground or ship to enemy action if the planes were not assigned to a squadron reporting action during the month.

(c) Number of Carriers in Action; Carrier Complement;

The number of carriers in action was taken from action reports. Carrier complement is based on the apparent normal number of planes carried at the beginning of the month's operations by carriers of each class.

(d) Enemy Aircraft Destroyed on Ground;

In the case of planes destroyed on ground by carrier-based aircraft, the final evaluations of the carrier task force commanders were used in lieu of the claims advanced in squadron action reports. Squadron claims have been used, however, for grounded planes destroyed by our land-based aircraft, in view of the small numbers involved, and the general lack of final evaluations. (Squadron claims have been used consistently for enemy aircraft destroyed in air combat, since in few instances have higher commands reduced these claims).

All statistical data, except the types listed in (a) to (d) above, have come from the basic sources previously listed.

NOTE

DEFINITIONS

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NUMBER OF PLANES ON HAND Number of aircraft reported assigned to a unit during a month in which that unit reported having action against the enemy (other than ASW). Data have been checked for erroneous reporting and adjustments made on basis of normal complement and volume of operations. Not presented for months prior to January 1944.

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CARRIER COMPLEMENT Number of aircraft normally carried by carrier of the class at beginning of the operations in question.

NUMBER OF CARRIERS IN ACTION Total number whose aircraft engaged in action against the enemy (other than ASW) at any time during the period in question.

FLIGHTS, SQUADRONS IN ACTION Number of flights, for all purposes including combat and attack, reported for a calendar month by a squadron reporting action against the enemy (other than ASW) during the same month. Data have been checked for erroneous reporting and failure to report and adjustments made. Not available on monthly basis prior to January 1944.

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ACTION SORTIES Number of planes taking off on a mission which eventuated in an attack on an enemy target or in aerial combat, or both. This basis of tabulation was the number of planes of one squadron taking off on the mission. If any of these planes had action, the entire squadrons's planes on the mission were counted as action sorties, including abortive planes, planes which reached the target but did not attack, and planes which escorted or patrolled but did not engage in combat. Thus if 16 VF took off as escort, 2 returned early, 2 engaged in combat, and 4 strafed, all 16 were counted as action sorties. Likewise if 8 planes took off for CAP, and only 2 engaged in combat, all 8 were action sorties. On the other hand, if 8 VF took off for escort, and none engaged in any sort of attack or combat, then none were counted as action sorties, even though they reached the target, and even though the escorted bombers attacked the target. Likewise, CAP planes missions, none of whose planes engaged in combat were not counted as action sorties.

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LOSSES OF OWN AIRCRAFT Loss data have come primarily from two sources; (1) action reports, squadron and ship, covering losses from all causes on missions involving actual combat with the enemy, and (2) loss reports, covering losses from all causes whatsoever.

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The losses on action sorties reported herein have been taken primarily from action reports, in which the exact cause of loss can be determined more accurately. Two major exceptions to this practice may be noted; (a) losses on unreported or poorly reported combat missions have been added from loss report sources; these may sometimes be inflated, because of a tendency in the early loss reports to ascribe to "combat" or "enemy aircraft" losses whose cause was unknown; (b) aircraft listed in action reports as seriously damaged rather than lost, and later indicated in loss reports to have been scrapped or jettisoned because of this damage; these have been added as losses on action sorties.

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Losses other than on action sorties have been taken from the loss reports, with some confirmation from carrier and squadron reports. The accuracy of loss reports, particularly with respect to cause of loss and date of loss, is frequently debatable, and many adjustments have been made where indicated.

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LOSSES ON ACTION SORTIES Includes all planes counted as action sorties, which failed to return to a friendly base or were destroyed in landing at base, plus planes returning and later destroyed because of damage sustained during the mission, plus planes lost on unreported missions which apparently involved action with the enemy. All losses on action sorties have been classified by cause under the three categories; Enemy A/A, Enemy A/C, and Operational. Where the exact cause was not given in the action report (planes reported missing) the cause most likely under the circumstances of loss described was arbitrarily assigned, or if the circumstances were not stated, the cause stated in the loss report was assigned.

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Losses on Other Flights These are limited to losses, during each month, of planes assigned to squadrons which reported engaging in action against the enemy during that month. For these squadrons these figures represent all operational losses of airborne planes, on missions not involving action against the enemy; they include also planes later stricken because of operational damage sustained on such flights.

Losses on Ship or Ground These figures are also limited to losses, during each month, by squadrons reporting action during the same month. For these squadrons they included all losses, regardless of cause, of planes not airborne at the time of the loss, or at the time the damage was sustained that ultimately resulted in the loss of the plane. Principal causes of these losses included; Struck by aircraft landing, taking off or taxiing, or by automotive vehicles; explosions and fires; storms, typhoons; enemy bombing or strafing or suicide attacks on carriers; own gunfire. It should be noted that all losses of grounded aircraft to enemy action are not included (some such losses were of aircraft assigned to pools or to squadrons not in action), nor is the greater part of the listed losses on ship or ground attributable to enemy action. The carrier losses in this category, however, do include all carrier planes lost in enemy attacks on carriers.

It should be noted, in connection with all categories of loss, that the figures for carriers represent all losses in active carrier combat operations (excluding strictly patrol and escort operations) in Pacific combat areas, while the land-based figures represent the bulk of, but not all, the losses of squadrons in active combat areas.

DAMAGE BY ENEMY A/A AND ENEMY A/C Planes receiving major and minor damage from the causes stated, as reported in squadron action reports only.

OWN PLANES ENGAGING ENEMY AIRCRAFT Number of airborne aircraft firing guns at, or fired at by, airborne enemy aircraft. In fact, probably a number of planes are included which do not meet this definition, but were in flights, or in sections or divisions of flights, of which other planes did fire guns or were fired at. Also, reports for many early actions did not specify the actual number of planes engaging in combat by any definition, and it was frequently necessary to make arbitrary assumptions based on own and enemy losses in the engagement. On the whole, however, these figures reflect with fair accuracy the number of aircraft engaging in and/or exposed to action with enemy aircraft.

ENEMY AIRCRAFT ENGAGED In general, this figure tends to approximate the number of enemy aircraft observed in formations which were actively engaged in aerial combat. An attempt has been made to exclude formations or parts of formations which were not actively engaged by the reporting squadron, but frequently the action reports were so vague with respect to the number of enemy planes actually engaged that it was necessary to use the total number of enemy planes observed in the area, or to adopt an arbitrary figure based on the number shot down.

It should also be noted that the figures on enemy planes engaged were compiled on a squadron basis. In engagements involving two or more of our squadrons at one time and place it is therefore likely that the same enemy formations may have been reported as engaged by each of the squadrons. Thus from the viewpoint of our mission as a whole, the number of enemy planes engaged is inflated by duplication. On the other hand, from the viewpoint of the number of individual plane-to-plane engagements, the figures on enemy planes engaged probably represent an understatement.

It should be noted that data on number of enemy planes engaged are inherently the least accurate of any data in this report, because of the natural inaccuracy of aerial observation; estimates of the size of enemy formations may vary by 50 percent or more depending on the observer and the circumstances.

TYPES OF ENEMY AIRCRAFT ENGAGED AND DESTROYED:

BOMBERS Includes identified types of single-engine and twin-engine bombers; all unidentified twin-engine aircraft; flying boats; and for 1942, 1943 and 1945 only, transports. Approximately 90% of the total consists of identified single-engine and twin-engine bombers, though the proportion varies from period to period.

FIGHTERS (More properly entitled "Fighters and other types") includes identified types of single-engine and twin-engine fighters; all unidentified single-engine aircraft, all float planes; all trainers; and for 1944 only, transports. Approximately 90% of the total consists of planes identified as single-engine fighters, though the proportion may vary from operation to operation.

It may be noted that identification was frequently deficient, many instances having been noted of Japanese Army planes reported in exclusively Navy theaters, of confusion between dive

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bombers and fighters, and between various models of single-engine fighters, and twin-engine fighters and bombers.

ENEMY AIRCRAFT DESTROYED IN COMBAT Airborne enemy aircraft claimed destroyed by naval aircraft, in aerial combat only. Planes destroyed by own anti-aircraft fire or in suicide crashes are not included. Enemy aircraft reported as "probably destroyed" are not included. Squadron claims, as made in ACA-1 or other action reports, are the basis for these figures. They thus represent the evaluations only of the squadron intelligence officer, squadron commander, and in some cases the air group commander. However, rarely was there any further evaluation by higher authority of squadron claims with respect to airborne enemy aircraft.

In evaluating pilot claims for ACA-1 reports squadron intelligence officers were instructed to follow the definitions of "destroyed" established for the command or theater. Subsequent to early 1944 this was the standard Army-Navy definition that the plane must be seen to crash, disintegrate in the air, be enveloped in flames, descend on friendly territory, or that its pilot and entire crew be seen to bail out. Prior to this time the definitions varied between commands, but the definitions used in the principal naval theater (SoPac) were at least equally stringent.

The degree to which squadron intelligence officers and commanders succeeded in eliminating duplicating and optimistic pilot claims is not known, but it is believed the amount of overstatement is relatively low. Since 93% of all enemy aircraft claimed destroyed by Naval aircraft were claimed by single-seat fighters and the bulk of the remainder were claimed by two-place dive bombers and by lone search planes, the tremendous duplication of gunners' claims experienced by air forces operating large formations of heavy bombers with multiple gun positions is largely eliminated. Duplication of claims between fighter planes can be more easily controlled by careful interrogation.

Over-optimism has always been difficult to control. During the early part of the war, before standard definitions were in force, before full-time trained Air Intelligence Officers were available to apply them, and before the need for conservative operational intelligence was fully appreciated, action reports may often have overstated enemy losses. Evidence from the Japanese has tended to indicate that in some of the early actions, and even as late as the Rabaul raids of early 1944, there was such overstatement.

It must be remembered, however, that the bulk of Naval aerial engagements in the Pacific did not involve the mass combat of Europe. Even the large-size engagements seldom involved more than 30 of our planes against 30 of the enemy's at any one time within visible range of any one point. By far the greatest number of engagements involved only 1 to 8 of our planes, or the same number of the enemy's. Thus in the main the claims under this heading, offset as they are by the exclusion of planes classified as "probably destroyed", are believed to be near the truth, with only local exceptions, and to be as conservative as those of any major airforce.

ENEMY AIRCRAFT DESTROYED ON GROUND In the case of carrier operations, these figures represent the number of non-airborne enemy aircraft reported by the task force commander as destroyed on ground or water, or on enemy carriers. These figures were normally based largely on photographic assessment, and only planes visibly burned out or obviously unrepairable were included unless there was other positive evidence to warrant their classification as destroyed. Assessment was on a field-by-field basis, eliminating duplication of squadron claims. For small-scale early operations, where no report was available from the task force commander, an estimate was made by Op-23-V-3, based on all available squadron and ship action reports, eliminating duplication of claims. For land-based operations, in view of the small volume involved, the claims in action reports were used.

TONS OF BOMBS ON TARGETS Calculated for each mission by taking the number of bombs of each type (plus clusters, torpedoes and mines) expended on targets, multiplying by the nominal weight of each, and rounding the total to the nearest ton. Bombs jettisoned are not included, nor bombs in abortive planes, nor bombs hanging up, nor rockets fired. In the case of search planes, particularly PB4Ys on single-plane long-range searches, tonnage dropped is understated by these figures, because of the large number of missions wherein less than $\frac{1}{2}$ ton was dropped per mission, the tonnage being rounded down to zero in the figures. For 1945 this difference is approximately 120 tons for PB4Ys, and less for other types of VPB. For other types of planes there may be small differences in either direction, due to this rounding of tonnages.

THEATER OF OPERATIONS For operations by land-based Naval and Marine aircraft, the breakdown by theater of operations (Tables 4 and 18) is based on the area command under which the operations were conducted. Thus operations by planes based in the South Pacific Area were included under that area even though they attacked targets in the Southwest or Central Pacific. The official limits of each command were used throughout, except that actions in the first few months of the war, before establishment of the area commands, were distributed on the basis of the commands subsequently established.

The method of assigning carrier operations to areas is explained in the text referring to Table 4.

AREA (GEOGRAPHICAL) OF TARGET OR ENGAGEMENT Each geographical area includes not only the land areas covered by its name, but all coastal waters. Engagements and shipping attacks far at sea were allocated to the nearest area. Most area names are believed self-explanatory, but the following additional explanations are given:

Hokkaido, No. Honshu	Japan, N. of 40°N.
Tokyo Area	Japan, S. of 40°N., E. of 138°E.
Central Honshu	Japan, S. of 40° between 133°E. and 138°E.
Kyushu, Kure Area	Japan, W. of 133°E.
Ryukyus	All islands in area bounded by 123°E, 24°N., 132°E, and 31°N., including Tanega, Minami, Daito, Miyako and Sakishima groups.
Formosa	Includes Pescadores
Bonins	Includes Iwo Jima, in addition to main group, plus the sea areas within about 300 miles of Chichi Jima.
Western Carolines	West of 150°E., including Palau, Yap, Woleai and intervening sea areas.
Eastern Carolines	East of 150°E., including Truk, Ponape, Kusaie, Nomoi Group.
Solomons, Bismarcks	Includes New Britain, New Ireland, Emirau and Bismarck Sea.
Korea, North China	Includes Manchuria and Shantung province.
Central China	Chekiang and Kiangsu provinces.
South China	Fukien and Kwangtung provinces, Hainan Island, Hong Kong.

PURPOSE OF MISSION OF OWN AIRCRAFT Assigned primary mission of aircraft at time of takeoff, regardless of later changes. Thus a search mission which finds and attacks shipping is classified as a search mission, a fighter sweep diverted to defense of force is still an attack mission. Note that in this report only action sorties - planes in actual action against the enemy - are classified by purpose of mission, and the large volume of negative patrols and searches, as well as the small volume of abortive offensive aircraft, are not included in the data. Classifications by purpose of mission differed in the 1944 machine tabulations from those for other years, and additional detail is thus provided for 1944, not available for other years.

BASE OF OWN AIRCRAFT The base is that from which the planes operated on the mission in question. Thus carrier aircraft temporarily operating from land bases are classified as land-based.

PLANE MODEL OF OWN AIRCRAFT Because of lack of detail in many action reports and limitations in the IBM system it has not been possible to distinguish between modifications or different manufacturers of the same basic aircraft. Thus "F4U" in the tables may include F4U and FG aircraft of all modifications, "F6F" will include the -3, -5, -3N and -5N, "TBF" or "TBM" may include modifications of either or both. However, the F4F and the FM-2 have been distinguished throughout.

SORTIES ATTACKING TARGETS There are two definitions for this item, one for 1944, and one for other years, because of the differing methods used in preparing IBM machine cards:

1942, 1943, 1945 Each plane attacking targets is counted only once per mission, regardless of how many targets it attacked successively, with bombs, rockets or guns.

1944 Each plane attacking targets is counted once for each major type of target attacked with bombs, rockets or guns. This permits one plane to be counted as making two or more attacks on one mission. The number of "sorties attacking targets" as reported on this basis for 1944, is believed on the average to be about 15% greater than if recorded on the 1945 basis.

Note that "sorties attacking targets" differs from "action sorties" in all years, by excluding planes taking off which did not individually attack targets.

THEATER OF OPERATIONS For operations by land-based Naval and Marine aircraft, the breakdown by theater of operations (Tables 4 and 18) is based on the area command under which the operations were conducted. Thus operations by planes based in the South Pacific Area were included under that area even though they attacked targets in the Southwest or Central Pacific. The official limits of each command were used throughout, except that actions in the first few months of the war, before establishment of the area commands, were distributed on the basis of the commands subsequently established.

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Hokkaido, No. Honshu	Japan, N. of 40°N.
Tokyo Area	Japan, S. of 40°N., E. of 138°E.
Central Honshu	Japan, S. of 40° between 133°E. and 138°E.
Kyushu, Kure Area	Japan, W. of 133°E.
Ryukyus	All islands in area bounded by 123°E, 24°N., 132°E, and 31°N., including Tanega, Minami, Daito, Miyako and Sakishima groups.
Formosa	Includes Pescadores
Bonins	Includes Iwo Jima, in addition to main group, plus the sea areas within about 300 miles of Chichi Jima.
Western Carolines	West of 150°E., including Palau, Yap, Woleai and intervening sea areas.
Eastern Carolines	East of 150°E., including Truk, Ponape, Kusaie, Nomoi Group.
Solomons, Bismarcks	Includes New Britain, New Ireland, Emirau and Bismarck Sea.
Korea, North China	Includes Manchuria and Shantung province.
Central China	Chekiang and Kiangsu provinces.
South China	Fukien and Kwangtung provinces, Hainan Island, Hong Kong.

PURPOSE OF MISSION OF OWN AIRCRAFT Assigned primary mission of aircraft at time of takeoff, regardless of later changes. Thus a search mission which finds and attacks shipping is classified as a search mission, a fighter sweep diverted to defense of force is still an attack mission. Note that in this report only action sorties - planes in actual action against the enemy - are classified by purpose of mission, and the large volume of negative patrols and searches, as well as the small volume of abortive offensive aircraft, are not included in the data. Classifications by purpose of mission differed in the 1944 machine tabulations from those for other years, and additional detail is thus provided for 1944, not available for other years.

BASE OF OWN AIRCRAFT The base is that from which the planes operated on the mission in question. Thus carrier aircraft temporarily operating from land bases are classified as land-based.

PLANE MODEL OF OWN AIRCRAFT Because of lack of detail in many action reports and limitations in the IBM system it has not been possible to distinguish between modifications or different manufacturers of the same basic aircraft. Thus "F4U" in the tables may include F4U and FG aircraft of all modifications, "F6F" will include the -3, -5, -3N and -5N, "TBF" or "TBM" may include modifications of either or both. However, the F4F and the FM-2 have been distinguished throughout.

SORTIES ATTACKING TARGETS There are two definitions for this item, one for 1944, and one for other years, because of the differing methods used in preparing IBM machine cards:

1942, 1943, 1945 Each plane attacking targets is counted only once per mission, regardless of how many targets it attacked successively, with bombs, rockets or guns.

1944 Each plane attacking targets is counted once for each major type of target attacked with bombs, rockets or guns. This permits one plane to be counted as making two or more attacks on one mission. The number of "sorties attacking targets" as reported on this basis for 1944, is believed on the average to be about 15% greater than if recorded on the 1945 basis.

Note that "sorties attacking targets" differs from "action sorties" in all years, by excluding planes taking off which did not individually attack targets.

ROCKETS ON TARGETS Number of aircraft rockets (of all sizes) expended on targets by planes attacking targets, as defined above.

AMMUNITION EXPENDITURES For 1944 these figures represent expenditures on enemy targets, by planes attacking targets, and expenditures in aerial combat are excluded. For 1943 and 1945 the figures represent total expenditures on targets and in aerial combat. Because of a general failure to report rounds expended prior to late 1943, ammunition expenditures for 1942 and early 1943 are not given herein.

TARGET TYPE CLASSIFICATION Two moderately diverse systems of classifying the types of targets attacked have been used in compiling these statistics, one for 1944, the other for the remainder of the war. These differences, combined with the varying methods of counting sorties attacking targets, require some discussion as to their effect on the statistics.

For 1944, as has been noted, planes attacking targets were counted once for each major type of target attacked on the same mission. In carrying out this tabulating procedure the exact number of planes making primary or secondary attacks on a target was allocated to that precise type of target. Thus if from one 8 plane fighter mission 6 planes bombed a destroyer, 2 bombed a large tanker, and 4 in addition strafed small fishing craft, the statistics on the 1944 basis would show 6, 2 and 4 planes attacking unarmored warships, large merchant vessels, and small merchant vessels, respectively, and the ordnance expended would be distributed accordingly.

The simplified tabulating system adopted for 1945, and carried back to 1942 and 1943, provided for counting only once per mission each plane attacking targets, and for assigning only one target per squadron per mission. The target classification assigned was that receiving the greatest weight of attack. Thus the example above, if included in 1945 statistics, would show 8 sorties, and all ordnance, expended on unarmored warships.

The 1944 system undoubtedly provided much greater statistical precision, but involved an inordinate amount of labor in tabulation. There is some question whether, in the end, the precision was much greater than in the 1945 system, because; (a) the number of missions splitting targets, while substantial, is not a large proportion of the total, and (b) over a number of missions the errors may well cancel, e.g. a target type which is secondary on one split mission becomes primary on another split mission.

A rough estimate of the relative statistical effects of the two systems is as follows; the 1944 system, by giving full weight as attack sorties to secondary strafing and rocket runs on the types of targets normally attacked on such runs over-emphasized the weight of attack on such targets; the 1945 system, ignoring those types of targets which seldom receive the major weight of attack, under-emphasizes the amount of effort expended on them. The principal type of target affected is undoubtedly small shipping under attack by carrier aircraft; there is probably a major effect in the case of minor military targets but this is small when compared to the total weight of attack on military targets; there is probably a minor effect on the "harbor areas" and "land transportation" target classifications. On the whole, it is not believed that these factors unduly distort the overall picture of the proportion of the Naval air offensive expended against the various classes of enemy targets.

Major differences in classification of specific items between 1944 and the other years may be briefly noted as follows;

- (1) The 1945 classification "Airfields" includes parked aircraft, runways, hangars and other airfield buildings, and all airfield defenses. The 1944 figures for airfields probably exclude most, but not all attacks on airfield buildings, but include all the other target sub-types listed. (The 1944 attacks on "airfield runways" undoubtedly include some attacks on buildings and guns also). Airfield buildings not included under airfields for 1944 are covered under "Other Military Targets".
- (2) "Harbor Areas" for 1945 includes waterfront A/A defenses. For 1944 some of these may be included in "Other Military Targets".

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COMPLETENESS OR ACCURACY OF DATA1. Completeness and Accuracy In General

Accuracy of Machine Tabulation: All general tables, and special tables of aerial combat and anti-aircraft data (Tables 1 - 29 inclusive) have been cross-checked to assure complete internal consistency within each table and between tables, except as specifically noted in individual cases.

All tables containing breakdowns by type of target, by geographical area, and by type of ordnance, have been checked to insure that no significant discrepancies are present. In the case of these tables the complications of machine tabulation have made a certain number of minor discrepancies inevitable; these were considered not to warrant expenditure of the inordinate amount of time required to correct them, since none can have any effect on conclusions to be drawn from the data.

For data on night operations no master check data were available. Spot checks were made, and the totals and breakdowns appear to be generally reliable.

Accuracy of Compilation: Human error, when thousands of coding cards are prepared from action reports of variable and confused patterns by personnel of clerical grade, is inevitable. The most thorough preparation of definitions and instructions, and constant supervision, do not eliminate the need for constant exercise of judgment by such personnel, when reducing to simple statistics an operation as complex as an action by Naval aircraft bombing, rocketing and strafing a multiplicity of targets and engaging in aerial combat. To this inherent difficulty the lack of uniform report forms during the first half of the war, and the lack of uniform quality of reports in the last half, contributed. However, every possible source of error has been either (a) anticipated and provided against, (b) checked and corrected, (c) checked and the data eliminated as not susceptible to accurate compilation, or (d) checked and presented with footnotes and reservations as expressed hereafter. It is the opinion of those responsible for this compilation that the data contain no significant biases resulting from the statistical compilation methods used, which are not fully noted in connection with the items affected.

Accuracy of Reporting: It is axiomatic that observations made in the heat of fast-moving air action are subject to a large margin of error. It is also well known to those who have participated in carrier operations, and in land-based operations under the front-line conditions which have prevailed in such areas as the Solomons and Okinawa, that the obstacles in the way of full interrogation of pilots, evaluation of the data received, and preparation of thorough action reports, have been extreme. The data herein suffer much more from the latter factor than from the basic difficulty of inaccurate observation, since the bulk of the statistical items do not depend upon aerial observation.

Accuracy of observation enters into only two major items in these tables; enemy aircraft engaged and enemy aircraft destroyed in combat, and the second of these has generally been the subject of the most careful interrogation and evaluation prior to reporting. The inability of the intelligence officer to perform his duties at an optimum quality level may affect a larger number of items, particularly those concerning attacks on targets, the number of planes actually attacking each target, and the number and type ordnance actually expended on each. The effect of these deficiencies on the statistics herein cannot be measured; items wherein it was believed to be large have been eliminated from the tabulations, and in the remaining items it is believed to be moderate, subject to a few specific exceptions described under individual items.

Completeness of Reporting: So far as is known, all carrier air action against the enemy during the entire war is completely covered herein. It is believed that 98% or more of every category of action by land-based planes is covered for the period from the latter months of 1943 to the end of the war. For the period from 7 December 1941 to mid-1943 it is known that a substantial amount of action by land-based planes has not been covered by the reports available, and is thus not included. The amount excluded is not believed to exceed 10% of the total reported for this period. Practically all of this deficiency was in the Solomons area.

For 1942 and 1943 particularly, and to a limited extent in later years, data were not always available to indicate whether escort fighters on a given mission strafed or were fired at by enemy A/A. Where no information was available it was assumed that escort fighters did not meet the definition for action sorties. Thus the number of fighter action sorties, and fighter scr-

ties attacking targets, may be understated for the early part of the war. It should be noted that the number of fighter sorties attacking targets (and offensive fighter action sorties), as reported herein will in all years be less than the number of fighters over target (a figure not compiled), by the number of escort fighters not actually attacking or engaging the enemy. The difference became progressively smaller in 1944 and 1945, however, as the increased ratio of fighters to bombers, the emphasis on strafing of parked aircraft and A/A guns, and the installation of bomb racks and rocket launchers on VF, resulted in attacks by a larger proportion of the fighters reaching a target area.

2. Accuracy and Completeness with Respect to Specific Items

(Items not mentioned have no specific individual deficiencies, but are subject to the general qualifications above).

Planes on Hand, and Flights: Original data have been arbitrarily edited to remove obvious errors; see discussion under Definitions. Items are subject to inaccuracy in reporting, but no particular bias is suspected.

Action Sorties: Subject to incomplete reporting (for land-based units only), and undercounting of fighters over target, as noted above.

Own Aircraft Losses: Losses to enemy aircraft are probably overstated by up to 25% for 1942-43, because of the lack of an adequate system for reporting cause of loss accurately. Operational losses are probably understated, but to a lesser amount, the difference being chargeable to losses on ground. This item is not affected by incompleteness of action reports, because of the check available in the independent strike reports.

Own Aircraft Engaging in Air Combat: Probably slightly understated for 1942-43, because of failure of action reports to specify exact number engaging, and slightly overstated thereafter because of inclusion of entire flight in some cases where only a part actually engaged.

Enemy Aircraft Engaged: Overstated throughout. See discussion under Definitions.

Enemy Aircraft Destroyed: See discussion under Definitions. Also, slight understatement for 1942-43 (land-based only) because of incomplete reporting.

Bomb Tonnage on Targets: Believed slightly understated for 1942-43, because of incomplete reporting (land-based only), and failure to report full bomb load in some instances (carrier-based and land-based). Affected somewhat by rounding bomb tonnage per mission to nearest ton; see discussion under Definitions.

No. of Squadrons in Action: Affected in 1942-43 by failure of some land-based squadrons to report action.

Sorties Attacking Targets: Affected by incomplete reporting, by inadequate reports (especially VF, see above), and by difference between 1944 and 1942-43-45 coding systems (see discussion under Definitions). Note that, even for 1944, and increasingly for other years, the total number of sorties attacking targets is greater than the number attacking either with bombs, or with rockets, or strafing, considered separately, because included in the figure are sorties which attacked with only one of these three types of attack, as well as sorties combining two or three methods.

Rocket Expenditures: Subject to some under-reporting, particularly by CV fighter squadrons in late 1944 and early 1945, and to considerable carelessness in the reports of some squadrons.

Ammunition Expenditures: Not shown for period prior to late 1943 because of almost total failure to report this item. Believed partially incomplete for late 1943 and first half of 1944, for land-based VSB and VTB operating in the Solomons. A tendency to report expenditures on an arbitrary basis, such as 1000 rounds per plane per mission, has been observed in the case of some fighter squadrons, and it is certain that for a large proportion of the action reports the ammunition expenditure figures were the roughest of estimates. To what extent this may bias the overall figures or figures for any single plane model, it is impossible to say, but it is doubted that the error is in excess of 25% low or high.

Own Planes Damaged by A/A or Enemy A/C: These figures are probably considerably understated for many 1942-43 actions, and slightly understated for 1944-45, because of failure to report all instances of minor damage, and damage inflicted by one of these agents to planes lost from another cause.

Purpose of Mission: Subject to personnel error in coding. The only probable general bias would be to favor an offensive classification at the expense of reconnaissance, but the extent of this would be small. It should be noted that defensive and reconnaissance missions are included in these tables only if they actually engage or attack the enemy, and thus are considerably understated from the point of view of total missions flown.

Type of Target: Subject to errors of classification in coding, and to systematic errors resulting from the two coding systems used (see discussion under Definitions). The net effects of these factors are approximately as follows:

1944; An overstatement of attack activity in comparison with other years, but a relatively accurate distribution of attacks, bombs and rockets by target type. Ammunition, usually arbitrarily distributed by the coding clerk between the several targets on a mission, is subject to considerable error, but the direction of the bias, if there is any general bias, cannot be estimated.

1942-43-45; A general bias in favor of large assigned primary targets attacked in force by the majority of a mission's planes, at the expense of small secondary targets attacked by one or two of the mission's planes or on second runs over target. The net effect is probably to understate the amount of attacks, bombs, rockets and ammunition expended on small merchant vessels, on land transportation targets, and on harbor areas, and to overstate expenditures on large vessels, airfields, and military targets.

Type of Bomb: This item was subject to coding errors, which have been largely detected and corrected. However, instances of inadequate reporting may also have resulted in slight errors as to size and type of bomb, and number expended on target, but not sufficiently to affect the general validity of the figures.

Models of Enemy Aircraft Destroyed: Subject to a major degree to mis-identification by pilots, and presented only as a matter of general interest, and as reliable only with respect to the major type classifications (fighters, bombers, float planes, etc.).

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PART A. GENERAL DATA ON FLIGHTS, ACTION
SORTIES, BOMB TONNAGE DROPPED, ENEMY AIRCRAFT DESTROYED,
AND OWN AIRCRAFT LOSSES

The tables in this section of the report (Tables 1-18) provide a broad overall picture of Naval and Marine air operations as a whole. There are three general subdivisions in this section:

1. General summaries of both carrier and land-based air operations, including breakdowns between carrier and land-based, between Navy and Marine, by plane model, by theater, and by months. (Tables 1-7).
2. General data on carrier operations, including breakdowns by plane model and by type of carrier, by operations, by areas, and by months, plus special tabular analyses of carrier operating ratios during various periods. (Tables 8-15).
3. General data on land-based air operations, including data broken down between Navy and Marine, by plane model, by theater, and by months. (Tables 16-18).

In general the tables will be allowed to tell their own story, but for each table or group of related tables a narrative commentary will call attention to significant items or relationships, and note any special qualifications applying to the data presented.

1. General Summaries of Carrier and Land-Based Operations

NOTES TO TABLES 1 AND 2

Tables 1 and 2 assemble, for the entire war, all the basic general statistics of Naval and Marine carrier and land-based combat operations included in this report. Table 1 breaks down the data between land-based and carrier operations, and between Navy and Marine aviation; Table 2 consolidates the data by plane model without reference to base or arm of service.

A further breakdown of the carrier figures by type of carrier will be found in Table 8.

Table 1 shows the overall combat effort exerted by Naval Aviation; 284,073 sorties engaging in attacks or aerial combat, or both, and 102,917 tons of bombs, torpedoes and mines expended on targets. Of these totals the carrier forces held a slight edge in number of action sorties, while land-based aviation (with a lesser proportion of fighters to bombers) held a slight advantage in bomb tonnage.

58% of the combat effort, about 165,000 sorties out of 284,000, was by planes attached to Navy units. From carriers, 98% was by Naval planes; from land bases 84% was by Marine aircraft. Of the Navy's share of the land-based action sorties, about 40% were flown by VPB, the remainder by carrier squadrons temporarily based ashore in emergency or when opportunities for carrier employment were lacking, and by a few land-based Naval support squadrons employed in 1943 and early 1944.

The overall loss rate for Navy and Marine aircraft on action sorties was 1.5 percent. Of the losses on action sorties, 47 percent resulted from enemy antiaircraft, 21 percent from combat with enemy aircraft and 32 percent from operational causes. The loss rate on action sorties by carrier aircraft was 2.0 percent (49% to antiaircraft, 16% to enemy aircraft, and 35% operational causes). The action loss rate for land-based aircraft was only 1.0 percent of sorties; this difference reflects the greater employment of carrier aircraft against heavily defended advanced targets, while a major employment of land-based planes was in clean-up operations against by-passed enemy bases or secondary targets.

Operational losses of Naval and Marine aircraft on flights not involving action (but made by squadrons having other action during the same month) were 3,045 in number; these are chargeable against an estimated 600,000 non-action flights by these squadrons, indicating an operational loss rate of about 0.5 percent on the patrol and search missions which made up the bulk of this non-action flying by combat squadrons. 1313 planes attached to the same squadrons were
(Cont. on p. 15)

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TABLE 1. CONSOLIDATED SUMMARY OF NAVY AND MARINE
CARRIER AND LAND-BASED AIR OPERATIONS AND RESULTS FOR ENTIRE WAR,
By Model of Aircraft Employed

BASE, SERVICE, PLANE MODEL	TOTAL ACTION SORTIES	OWN LOSSES					ENEMY AIRCRAFT DESTROYED IN COMBAT		TONS OF BOMBS ON TARGETS
		ON ACTION SORTIES			ON OTHER FLIGHTS	ON SHIP OR GROUND	Bombers	Fighters	
		To Enemy A/A	Opera- tional A/C						
CARRIER-BASED, TOTAL	147,094	1428	452	1001	1988	974	1997	4487	45,659
Navy Total	143,357	1377	436	979	1932	936	1938	4328	44,972
F6F	62,240	538	245	321	829	403	1387	3568	5,967
F4U, FG	6,488	93	18	48	182	76	100	260	954
FM	12,925	62	13	75	283	71	194	228	148
F4F	1,102	17	47	31	49	22	190	112	6
SB2C, SBW	18,808	268	18	218	184	88	13	30	10,994
SBD	6,048	40	43	48	65	35	31	75	2,524
TBF, TBM	35,564	348	27	231	339	227	22	50	24,245
TBD	182	11	25	8	1	14	1	5	134
Marine Total	3,737	51	16	22	56	38	59	159	687
F4U, FG	3,093	44	16	21	47	38	59	159	358
F6F	146	2	0	0	8	0	0	0	25
F4F	2	0	0	1	0	0	0	0	0
TBM	496	5	0	0	1	0	0	0	304
LAND-BASED, TOTAL	136,979	554	455	344	1057	339	759	2048	57,258
Marine Total	114,127	386	270	259	724	135	533	1484	47,269
F4U, FG	52,852	207	141	157	458	48	300	1100	14,305
F6F	1,646	5	2	3	27	5	46	47	284
F4F	1,074	4	75	11	34	26	175	281	0
F2A	25	0	14	0	0	0	6	4	0
SBD	40,872	96	24	56	104	36	0	22	18,147
SB2C, SBW	2,023	1	0	3	13	0	0	0	1,086
SB2U	17	1	1	3	1	0	0	6	5
TBF, TBM	7,151	53	11	14	56	16	1	18	5,437
PBJ	8,390	18	0	12	23	2	0	0	8,002
PV	52	1	1	0	5	2	5	6	2
PB4Y	16	0	0	0	0	0	0	0	0
PBY	9	0	1	0	3	0	0	0	1
Navy Total	21,373	168	185	84	333	202	225	562	9,796
F6F	2,470	8	23	16	21	5	12	103	227
F4U	1,269	5	14	4	5	0	19	141	4
F4F, FM	450	3	56	7	29	20	53	94	0
SBD	5,283	17	12	4	55	19	0	10	2,185
SB2C, SBW	332	2	0	1	2	6	0	0	104
TBF, TBM	3,290	16	9	15	20	3	0	7	2,701
PB4Y	3,624	60	28	18	85	72	125	181	1,413
PV	2,636	28	5	12	34	22	3	6	1,912
PBY	1,371	15	35	5	47	43	0	9	949
PBM	506	13	3	1	33	9	6	10	204
PB2Y	142	1	0	1	2	3	7	1	97
Service Unknown	1,479	0	0	1	0	2	1	2	193
F4U	349	0	0	0	0	2	0	2	0
F6F	28	0	0	0	0	0	0	0	0
VF, type unknown	440	0	0	0	0	0	1	0	14
SBD	484	0	0	1	0	0	0	0	86
TBF	137	0	0	0	0	0	0	0	50
VPB, type unknown	41	0	0	0	0	0	0	0	43
GRAND TOTAL	284,073	1982	907	1345	3045	1313	2756	6535	102,917

TABLE 2. SUMMARY OF AIR OPERATIONS AND RESULTS, FOR ENTIRE WAR
By Type and Model of Aircraft
(Land and Carrier, Navy and Marine Combined)

PLANE MODEL	TOTAL ACTION SORTIES	OWN LOSSES					ENEMY AIRCRAFT DESTROYED IN COMBAT		TONS OF BOMBS ON TARGETS
		ON ACTION SORTIES		OPERATIONAL	ON OTHER FLIGHTS	ON SHIP OR GROUND	BOMBERS	FIGHTERS	
		To Enemy A/A	A/C						
<u>VF Total</u>	146,599	988	664	694	1972	716	2542	6099	22,292
F6F	66,530	553	270	340	885	413	1445	3718	6,503
F4U, FG	64,051	349	189	230	692	164	478	1662	15,621
FM	12,925	62	13	75	283	71	194	228	148
F4F	2,628	24	178	49	112	68	418	487	6
F2A	25	0	14	0	0	0	6	4	0
Type Unknown	440	0	0	0	0	0	1	0	14
<u>VSB Total</u>	73,867	425	98	334	424	184	44	143	35,131
SBD	52,687	153	79	109	224	90	31	107	22,942
SB2C-SBW	21,163	271	18	222	199	94	13	30	12,184
SB2U	17	1	1	3	1	0	0	6	5
<u>VTB Total</u>	46,820	433	72	268	417	260	24	80	32,871
TBF, TBM	46,638	422	47	260	416	246	23	75	32,737
TBD	182	11	25	8	1	14	1	5	134
<u>VPB Total</u>	16,787	136	73	49	232	153	146	213	12,623
PB4Y	3,640	60	28	18	85	72	125	181	1,413
PV	2,688	29	6	12	39	24	8	12	1,914
PBJ	8,390	18	0	12	23	2	0	0	8,002
PBY	1,380	15	36	5	50	43	0	9	950
PBM	506	13	3	1	33	9	6	10	204
PB2Y	142	1	0	1	2	3	7	1	97
Type Unknown	41	0	0	0	0	0	0	0	43
GRAND TOTAL	284,073	1982	907	1345	3045	1313	2756	6535	102,917

(Cont. from p. 13)

lost to enemy action or in accidents while not in flight. More detailed analyses of loss rates, for the years 1944 and 1945 only, are given in Tables 9 and 16 of this report.

Over ten enemy aircraft were shot down by Naval and Marine aircraft for each loss in air combat. The great bulk of the destruction of enemy aircraft in aerial combat is credited to the F6F, which shot down 5,163 enemy planes (56% of the total for Naval aviation) in exchange for 270 air combat losses, or over 19 enemy planes destroyed per loss in air combat. The F4U was second, with 2,140 enemy planes to its credit, the F4F, FM, and PB4Y following next in order with 915, 422 and 306 respectively. Only 355 enemy planes were shot down by all other types of Naval aircraft combined. It may be noted that all types of bombers combined shot down 650 enemy planes, and lost 243 in combat, a superiority of over $2\frac{1}{2}$ to 1, evidencing superior equipment, tactics, and gunnery training. Less than 1/5 of one percent of all naval bomber sorties attacking or engaging the enemy were shot down by enemy aircraft. (Most of these were in the early stages of the war, as Table 21 will indicate).

For carrying the maximum weight of explosives against the enemy the TBF (and TBM) aircraft was the Navy's workhorse. Flying only 16 percent of the total action sorties, it delivered 32 percent of the total tonnage (plus 29% of all rockets expended on targets; see Table 50). Dive bombers accounted for 34% of total bomb tonnage, but in a 58% greater number of action sorties than the VTB flew. Fighters, flying over 50% of all action sorties, delivered only 22% of total bomb tonnage; only 30% of this (or 16% of total carrier bomb tonnage) was dropped by carrier-based fighters, which flew nearly 60% of all carrier action sorties. Fighters, however, fired over 138,000 rockets at targets, two-thirds of the Navy total, and fired offensively over 50,000,000 rounds of ammunition, which was also over two-thirds of the total for Naval aviation.

Patrol bombers, flying 6% of the Navy's action sorties, dropped 12% of the bomb tonnage. Half of these sorties and nearly two-thirds of this tonnage is credited to Marine PBJ attack bombers. The Navy VPB, being primarily search planes, seldom carried or used their maximum bomb loads, and engaged in action against the enemy on only a small fraction of their missions.

TABLE 3. SUMMARY OF MONTHLY OPERATIONS AND RESULTS
FOR ALL CARRIER-BASED AND ALL LAND-BASED NAVAL
AND MARINE AIRCRAFT

MONTH	CARRIER-BASED					LAND-BASED				
	FLIGHTS, SQUADRONS IN ACTION	ACTION SORTIES	TONS OF BOMBS ON TARGETS	ENEMY PLANES DESTROYED		FLIGHTS, SQUADRONS IN ACTION	ACTION SORTIES	TONS OF BOMBS ON TARGETS	ENEMY PLANES DESTROYED	
				Air	Ground				Air	Ground
1941-December	*	0	0	0	0	*	70	5	12	0
1942-January	*	0	0	0	0	*	13	0	1	0
February	*	243	77	33	12	*	6	0	1	0
March	*	142	51	1	0	*	4	0	1	0
April	*	6	1	0	0	*	0	0	0	0
May	*	332	139	66	21	*	6	3	0	0
June	*	374	100	69	140	*	100	20	21	0
July	*	0	0	0	0	*	4	1	0	0
August	*	681	181	88	30	*	98	18	56	0
September	*	0	0	0	0	*	514	74	111	1
October	*	287	60	90	21	*	848	157	177	7
November	*	608	98	37	30	*	606	184	77	0
December	*	0	0	0	0	*	334	83	19	0
1943-January	*	78	23	11	0	*	396	97	54	4
February	*	20	0	4	0	*	430	248	21	2
March	*	0	0	0	0	*	361	211	1	0
April	*	0	0	0	0	*	446	159	46	0
May	*	86	4	0	0	*	454	226	15	0
June	*	0	0	0	0	*	775	344	128	0
July	*	7	0	0	0	*	3,144	1,675	186	3
August	*	290	116	0	7	*	1,135	427	109	21
September	*	196	83	5	15	*	1,643	599	108	9
October	*	933	335	43	27	*	1,602	689	69	23
November	*	2,989	962	191	43	*	2,835	1,181	98	6
December	*	528	198	46	32	*	2,924	1,379	106	1
1944-January	17,045	2,793	870	52	106	14,378	3,293	869	370	20
February	13,111	4,772	1,464	162	154	14,175	4,203	1,146	149	5
March	8,603	1,787	608	111	39	20,228	6,837	2,837	20	2
April	13,906	5,270	1,778	94	215	18,959	5,549	2,407	14	0
May	3,496	902	343	3	21	19,205	5,638	2,289	18	8
June	20,932	8,766	2,435	797	215	16,748	3,591	1,027	21	0
July	24,142	12,549	4,266	113	84	15,287	5,458	1,955	4	10
August	6,805	1,716	473	24	20	19,883	7,326	2,847	4	2
September	25,479	13,166	4,207	373	557	18,573	6,195	2,282	9	8
October	24,911	10,948	3,339	1,189	662	24,776	7,270	2,802	19	37
November	11,087	4,397	1,517	272	498	25,395	7,098	2,511	10	12
December	11,005	2,062	333	111	230	25,019	4,457	2,133	90	23
1945-January	25,747	8,637	2,308	243	474	20,377	3,744	1,516	15	20
February	20,896	5,959	1,246	432	238	20,417	8,562	3,753	27	21
March	28,312	12,132	3,162	349	369	22,863	8,733	4,039	26	30
April	41,248	16,052	5,033	1049	304	27,012	8,527	4,128	156	15
May	30,197	9,053	3,525	278	122	30,445	8,094	4,499	261	10
June	19,793	5,635	1,828	21	66	34,853	6,898	3,276	138	5
July	24,089	8,468	2,969	62	492	28,761	5,446	2,643	28	22
August	17,726	4,230	1,527	65	610	17,207	1,312	519	11	1
1941-42 TOTAL	*	2,673	707	384	254	*	2,603	545	476	8
1943 TOTAL	*	5,127	1,721	300	124	*	16,145	7,235	941	69
1944 TOTAL	180,522	69,128	21,633	3301	2801	232,626	66,915	25,105	728	127
1945 TOTAL	208,008	70,166	21,598	2499	2675	201,935	51,316	24,373	662	124
GRAND TOTAL	388,530	147,094	45,659	6484	5854	434,561	136,979	57,258	2807	328

* No data available.

1945
2500
4444
1947
2675
4622
19066
755

DECLASSIFIED

NOTES TO TABLE 3

This table presents condensed monthly data for carrier and land-based operations. In parallel columns it illustrates:

- (a) the slow growth of air activity from 1942 to the peak in April 1945;
- (b) the great preponderance of land-based operations during the rebuilding of the carrier force in 1943;
- (c) the rapid rise of the carrier force during 1944 to the point where its major operations far exceeded the more regular monthly volume of effort of the land-based air forces.

Revealed in the table are the peak performances of Naval aviation:

- (a) the 41,248 flights made from carriers in combat in April 1945, the 16,052 action sorties flown that month, and the 5,033 tons of bombs dropped on target (40,870 rockets and about 6,500,000 rounds of ammunition were expended by carrier planes during the same month);
- (b) the tremendous destruction of enemy planes by the carrier forces in June 1944 (1,012), October 1944 (1,851), and April 1945 (1,353);
- (c) the seven other months in which carrier aircraft destroyed more than 500 planes per month (9,250 enemy planes were destroyed by carrier aircraft in their 10 peak months, and 10,319 in the last 15 months of the war alone);
- (d) the exceptional feat of increased performance by the small South Pacific air force for the New Georgia operation of July 1943;
- (e) the relatively high destruction of enemy planes by the small forces engaged in the brief carrier operations of 1942, and the land-based Solomons operations of late August to November 1942;
- (f) the air-combat peaks by land-based aircraft over Rabaul in January-February 1944, and at Okinawa in April-June 1945.

The table also shows the superior record of carrier-based planes over land-based planes in destroying enemy aircraft; over twice as many in air combat, 18 times as many on the ground and 4 times as many in total. The ruling factor here was the mobility of the carrier forces, their ability to penetrate deep into enemy territory, concentrating overwhelming force in surprise strokes against large sectors of the enemy's secondary air defenses. Land-based aircraft, on the other hand, were seldom within reach of main concentrations of enemy air strength, except for a time at Rabaul, where the heavy defenses precluded successful attack on grounded aircraft. Thus the land-based Marine and Naval air forces, while effective against enemy airborne aircraft both in a defensive capacity and as bomber escorts, could not be the main agent of their wholesale destruction. It is doubted that any other airforce has been as effective in destroying grounded enemy aircraft (or grounded and airborne enemy aircraft combined) as the Naval carrier force; in the last year of the war our carrier aircraft destroyed 4,622 grounded enemy aircraft, and 4,944 airborne aircraft, for a total of 9,566.

6182

01291

6484
5854
12338

3133

DECLASSIFIED

NOTES TO TABLE 3

This table presents condensed monthly data for carrier and land-based operations. In parallel columns it illustrates:

- (a) the slow growth of air activity from 1942 to the peak in April 1945;
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6182
 9291
 6484
 5854
 12338
 3133

DECLASSIFIED

CONFIDENTIAL

TABLE 4. COMBAT AIR OPERATIONS AND RESULTS, CARRIER-BASED AND LAND-BASED, BY THEATRE AND BY YEAR.

THEATRE, YEAR	ACTION SORTIES	TONS OF BOMBS ON TARGETS	ENEMY AIRCRAFT DESTROYED		OWN LOSSES ON ACTION SORTIES			PERCENTAGES OF TOTALS			
			In Combat	On Ground	To Enemy A/A	Operational A/C	Action Sorties	Tons of Bombs	Enemy A/C Dest.	Own Action Losses	
<u>CARRIER-BASED</u>	<u>147,094</u>	<u>45,659</u>	<u>6484</u>	<u>5854</u>	<u>1428</u>	<u>452</u>	<u>1001</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>
<u>Central Pacific</u>	<u>108,108</u>	<u>34,181</u>	<u>3772</u>	<u>3204</u>	<u>941</u>	<u>245</u>	<u>635</u>	<u>73.5</u>	<u>74.8</u>	<u>56.5</u>	<u>63.3</u>
1941-42	634	189	85	152	24	46	25	0.4	0.4	1.9	3.3
1943	4,071	1,433	142	105	29	8	33	2.8	3.1	2.0	2.4
1944	41,956	13,298	1289	746	317	81	248	28.5	29.1	16.5	22.4
1945	61,447	19,261	2256	2201	571	110	329	41.8	42.2	36.1	35.2
<u>South Pacific</u>	<u>2,184</u>	<u>604</u>	<u>367</u>	<u>70</u>	<u>19</u>	<u>74</u>	<u>35</u>	<u>1.4</u>	<u>1.4</u>	<u>3.5</u>	<u>4.4</u>
1942	1,064	262	185	51	7	44	25	0.7	0.6	1.9	2.6
1943	915	268	156	19	12	26	10	0.6	0.6	1.4	1.7
1944	205	74	26	0	0	4	0	0.1	0.2	0.2	0.1
<u>Southwest Pacific</u>	<u>35,496</u>	<u>10,657</u>	<u>2300</u>	<u>2509</u>	<u>434</u>	<u>132</u>	<u>316</u>	<u>24.1</u>	<u>23.3</u>	<u>39.0</u>	<u>30.6</u>
1942	463	179	84	21	2	23	11	0.3	0.4	.9	1.3
1944	26,314	8,141	1973	2014	323	99	239	17.9	17.8	32.3	22.9
1945	8,719	2,337	243	474	109	10	66	5.9	5.1	5.8	6.4
<u>North Pacific</u>	<u>86</u>	<u>4</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0.1</u>	<u>*</u>	<u>0.0</u>	<u>0.2</u>
<u>Atlantic</u>	<u>1,103</u>	<u>174</u>	<u>40</u>	<u>30</u>	<u>31</u>	<u>1</u>	<u>8</u>	<u>0.8</u>	<u>0.4</u>	<u>0.6</u>	<u>1.4</u>
<u>Southeast Asia</u>	<u>117</u>	<u>39</u>	<u>5</u>	<u>41</u>	<u>3</u>	<u>0</u>	<u>0</u>	<u>0.1</u>	<u>0.1</u>	<u>0.4</u>	<u>0.1</u>
<u>LAND-BASED</u>	<u>136,979</u>	<u>57,258</u>	<u>2807</u>	<u>328</u>	<u>554</u>	<u>455</u>	<u>344</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>
<u>Central Pacific</u>	<u>114,335</u>	<u>15,421</u>	<u>677</u>	<u>57</u>	<u>199</u>	<u>58</u>	<u>92</u>	<u>32.4</u>	<u>27.0</u>	<u>23.4</u>	<u>25.8</u>
1941-42	144	18	32	0	4	31	6	0.1	*	1.0	3.0
1943	165	33	13	1	3	4	1	0.1	0.1	0.5	0.6
1944	25,158	9,043	63	26	77	3	36	18.4	15.8	2.8	
1945	18,868	6,327	569	30	115	20	49	13.8	11.1	19.1	13.6
<u>South Pacific</u>	<u>39,020</u>	<u>15,086</u>	<u>1897</u>	<u>109</u>	<u>205</u>	<u>342</u>	<u>149</u>	<u>28.5</u>	<u>26.3</u>	<u>64.0</u>	<u>51.4</u>
1942	2,379	512	438	8	20	96	25	1.7	0.9	14.2	10.4
1943	15,737	7,045	926	68	78	190	76	11.5	12.3	31.7	25.4
1944 (to 6/30)	20,904	7,529	533	33	107	56	48	15.3	13.1	18.0	15.6
<u>Southwest Pacific</u>	<u>52,862</u>	<u>26,451</u>	<u>226</u>	<u>161</u>	<u>134</u>	<u>30</u>	<u>96</u>	<u>38.6</u>	<u>46.2</u>	<u>12.3</u>	<u>19.2</u>
1941-42	40	5	4	0	0	14	0	*	*	0.1	1.0
1943	118	104	0	0	1	0	1	0.1	0.2	0.0	0.1
1944	20,383	8,316	129	67	59	10	27	14.9	14.5	6.0	7.1
1945	32,321	18,026	93	94	74	6	68	23.6	31.5	6.2	11.0
<u>Atlantic</u>	<u>58</u>	<u>3</u>	<u>2</u>	<u>0</u>	<u>3</u>	<u>2</u>	<u>1</u>	<u>*</u>	<u>*</u>	<u>0.1</u>	<u>1.0</u>
<u>North Pacific</u>	<u>704</u>	<u>297</u>	<u>5</u>	<u>1</u>	<u>13</u>	<u>16</u>	<u>6</u>	<u>0.5</u>	<u>0.5</u>	<u>0.2</u>	<u>2.6</u>
<u>TOTAL</u>	<u>284,073</u>	<u>102,917</u>	<u>9291</u>	<u>6182</u>	<u>1982</u>	<u>907</u>	<u>1345</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>
Central Pacific	152,443	49,602	4449	3261	1140	303	727	53.7	48.2	49.8	51.2
South Pacific	41,204	15,690	2264	179	224	416	184	14.5	15.2	15.8	19.5
Southwest Pacific	88,358	37,108	2526	2670	568	162	412	31.1	36.1	33.6	27.0
North Pacific	790	301	5	1	13	16	13	0.3	0.3	*	1.0
Atlantic	1,161	177	42	30	34	10	9	0.4	0.2	0.5	1.2
Southeast Asia	117	39	5	41	3	0	0	*	*	0.3	0.1

* Less than 1/20 of one percent.

NOTES TO TABLE 4

This table measures the contributions of the Naval carrier and land-based air forces to the campaigns in the various theaters of war. Land-based operations are allocated to theaters on the basis of the command under which the individual squadron operated, regardless of the location of the target attacked. Thus operations by South Pacific aircraft against the Bismarck Archipelago (in the SoWesPac area) are classified under SoPac (and in fact they were normally in support of SoPac objectives); in few other cases were attacks made over theater boundaries.

In the case of carrier operations, the fact that the fast carriers remained under CinCPOA command in all operations, though actually directly supporting campaigns in other areas, has necessitated adopting a geographical basis of classification. Thus all carrier operations are allocated to areas in accordance with (a) the theater in which the target area was located, or (b) the theater whose current campaign the carriers were primarily supporting.

Under these definitions all carrier operations against New Guinea, Halmahera, Morotai and the Philippines, the Coral Sea Battle, and the Formosa-Ryukyus-China Sea operations of October 1944 and January 1945 have been classified as Southwest Pacific. The Palau and Truk operations of March and April, though partly subsidiary to the Hollandia strikes, have been classified as Central Pacific; the carrier strikes on Rabaul and Kavieng as South Pacific. It is believed that all other carrier operations fell clearly within one theater.

The overall picture presented by this table shows that slightly over half of Naval air combat operations, in terms of sorties and enemy planes destroyed, were conducted in the Central Pacific theater, about one-third in the Southwest Pacific, slightly less than one-sixth in the South Pacific, and less than one percent in other theaters. (Addition of ASW activity would of course substantially alter the balance in favor of the Atlantic).

These figures should dispel any impression that naval aviation's primary war contribution was in the South Pacific theater. Less than 2% of the total carrier action was in this theater, though most of this minor total consisted of critical actions involving all our carriers available at the time. Of the total land-based action, only slightly over one quarter was carried on by aircraft under SoPac command (an additional 15% was action by Marine aircraft in the Solomons-Bismarcks area after command passed to SoWesPac).

The carrier force was primarily a Central Pacific force, the spearhead of the main advance against Japan. Nearly three-fourths of its action was in this theater. Yet its contribution to the Southwest Pacific theater, accounting for nearly a quarter of total action sorties, was vital, and was the action which in fact culminated the military defeat of Japan as an air-sea power.

The bulk of the carrier contribution to the Southwest Pacific campaign occurred in the five months from September 1944 to January 1945. In these five months practically all of the fast carrier offensive, and the majority of the CVE effort, was employed against Southwest Pacific targets. In these five months over 4500 enemy aircraft were destroyed by the carrier forces in the campaigns supporting SoWesPac operations; this represents nearly three-eighths of the total enemy planes destroyed by carrier forces during the war in all theaters. This contribution (involving also a wholesale destruction of shipping in the Philippines-Formosa-China Sea area, and the destruction of the bulk of the remaining Jap battle fleet) assured the capture of the Philippines by Southwest Pacific Forces.

The contribution of Naval and Marine land-based aircraft to the Southwest Pacific campaign has not been fully recognized. Leaving aside the 22,000 attack sorties flown against targets in the Bismarcks and Solomons after control of the Solomons air force passed to SoWesPac, Naval and Marine planes flew some 30,000 sorties in the Southwest Pacific area. The bulk of these 26,000 were attacks by Marine aircraft on targets in the Philippines. Marine fighters were based at Leyte from late November 1944, and took part in assuring the conquest of that island and defending it from Jap suicide attackers and reinforcing sea convoys. These fighters later assisted in the recapture of the Central and Southern Philippines. Marine dive bombers went ashore at Lingayen in January 1945 and provided air support to Army ground forces in Luzon until their later diversion to assist the reconquest of the Central Philippines and Mindanao. Navy patrol bombers extended their searches to the Philippines and began their single-plane attacks on shipping as early as August 1944, and continued them until capture of Philippines bases and the end of Jap shipping movements in the area enabled them to extend their searches and attacks to Formosa, the China Coast, Indo-China and Malaya, protecting all enemy paths of approach to the Philippines. For the year 1945 well over half the offensive operations of Naval land-based air were carried on in the forward sectors of the Southwest Pacific theater.

TABLE 5. NUMBER OF SQUADRONS IN ACTION, AND ACTION SORTIES FLOWN, MONTHLY,
By Model of Aircraft

A. CARRIER-BASED AIRCRAFT

MONTH	F4F, FM*		F4U, FG		F6F		SBD		SB2C, SBW		TBD, TBF, TBM#	
	No. of Sqdns. in Action	Ac- tion Sor- ties	No. of Sqdns. in Action	Ac- tion Sor- ties	No. of Sqdns. in Action	Ac- tion Sor- ties	No. of Sqdns. in Action	Ac- tion Sor- ties	No. of Sqdns. in Action	Ac- tion Sor- ties	No. of Sqdns. in Action	Ac- tion Sor- ties
1942-February	3	49					5	147			2	47
March	3	24					6	93			2	25
April							2	6				
May	2	83					4	183			2	66
June	4	91					6	239			3	44
August	3	181					6	422			3	78
October	2	143					4	82			2	62
November	6	367					5	198			4	43
1943-January	2	38					2	24			1	16
February	1	20										
May	2	86										
July							1	7				
August					3	108	2	88			3	94
September					3	85	1	50			3	61
October	1	21			6	378	4	294			7	240
November	1	14			15	1382	7	642	1	179	14	768
December	1	4			7	208	4	105	1	68	7	147
1944-January	2	23			13	1386	8	550	1	152	17	682
February	5	84			15	2166	8	1027	1	197	20	1298
March	2	14			11	907	3	314	2	145	13	407
April	5	43	1	2	16	2607	4	768	2	558	21	1292
May					7	402	1	19	3	275	7	206
June	8	517	1	6	18	4538	2	636	5	1131	26	1938
July	9	748	1	1	19	5804	2	154	7	2698	28	3144
August					12	1122			6	316	11	278
September	13	1535			19	5546			8	2903	32	3182
October	15	1273			20	4972			9	2196	35	2507
November					17	2453			11	1008	17	936
December	6	191			13	1600			7	108	19	163
1945-January	18	1165	2	131	13	4482			5	703	31	2156
February	11	1132	9	652	20	2465			7	500	27	1210
March	18	1803	17	2274	19	3853			10	1231	38	2971
April	16	2473	11	1916	20	5652			9	1515	36	4496
May	14	474	10	1021	22	3583			8	921	35	3054
June	12	1409	8	520	18	1425			7	288	29	1993
July			11	2012	18	3473			9	1162	20	1821
August	2	23	11	1047	18	1789			10	554	22	817
1942 Total		938		0		0		1,370		0		365
1943 Total		183		0		2,161		1,210		247		1,326
1944 Total		4,428		9		33,503		3,468		11,687		16,033
1945 Total		8,479		9,573		26,722		0		6,874		18,518
GRAND TOTAL		14,028		9,582		62,386		6,048		18,808		36,242

* F4F through October 1943, FM thereafter.

TBD through June 1942, TBF and TBM thereafter.

NOTE: No carrier action was reported for the months not listed in the table.
Composite squadrons are counted once for each type of plane included.

(Notes to this table are on p.23)

B. LAND-BASED AIRCRAFT, OF CARRIER TYPES

MONTH	F4F, FM		F4U, FG		F6F		SBD		SB2C, SBW		TBF		TBM	
	No. of Sqdns. in Action	Ac-tion Sor-ties	No. of Sqdns. in Action	Ac-tion Sor-ties	No. of Sqdns. in Action	Ac-tion Sor-ties	No. of Sqdns. in Action	Ac-tion Sor-ties	No. of Sqdns. in Action	Ac-tion Sor-ties	No. of Sqdns. in Action	Ac-tion Sor-ties	No. of Sqdns. in Action	Ac-tion Sor-ties
1941-December	1	49												
1942-March*														
June#	1	6					1	22			1		6	
August	2	57					2	31						
September	3	259					6	225			1		22	
October	7	478					5	311			1		49	
November	6	175					7	359			3		72	
December	3	40					4	284			1		7	
1943-January	2	84					3	284			1		26	
February	3	10					5	357			2		29	
March	1	8					5	157			4		159	
April	1	79	3	118			4	88			4		152	
May	1	3	4	113			2	128			2		203	
June	4	81	6	156			4	270			6		218	
July	3	167	6	358			9	1430			6		1125	
August			5	414			5	374			4		315	
September			5	430	4	169	8	558			5		393	
October			7	384	3	72	8	646			4		353	
November			9	821	4	100	9	1077			6		646	
December			6	467	3	261	10	1232			5		751	
1944-January			10	1151	3	254	6	915			5		427	
February			9	1750	1	149	7	1322			4		661	
March			14	1108	4	402	11	3046			5		1439	
April			13	1159	4	405	11	2516			5		943	
May			12	1594	1	358	10	2421			3		600	
June			13	1332	1	231	10	1526			1		48	
July			14	2901	1	23	8	2112			1		4	
August			20	4287	2	44	9	2324			1		28	
September			21	3563	2	44	10	1997			1		21	
October			23	4724	3	23	9	1920			2		18	
November			23	4875	2	273	9	866			3		161	
December			24	2932	2	26	10	370			3		97	
1945-January			19	2365	2	68	7	384			2		270	
February			17	3118	2	206	8	3999			2		129	
March		1	18	2775	3	245	7	4350	2	50	4		164	
April		1	19	3463	4	164	7	3017	4	281	2		132	
May			21	2431	6	232	8	2912	5	379	2		374	
June			19	2711	4	274	6	1797	5	768	3		270	
July		1	19	2423	6	116	6	1012	5	556	4		217	
August	1	25	15	547	3	5			4	321	3		49	
1941-42 Total		1,064		0		0		1,232		0				156
1943 Total		432		3,261		602		6,601		0				4,370
1944 Total		0		31,376		2,232		21,335		0				4,447
1945 Total		28		19,833		1,310		17,471		2,355				1,605
GRAND TOTAL		1,524		54,470		4,144		46,639		2,355				10,578

* 1 F2A squadron flew 4 action sorties.

1 F2A squadron flew 21 action sorties and one SB2U squadron 17 action sorties.

NOTE: No action by these types of planes was reported for the months not listed above.

Composite squadrons are counted once for each type of plane included.

TABLE 5. Continued

C. PATROL AIRCRAFT

MONTH	PBY		PBM		PB2Y		PB4Y		PV		PBJ	
	No. of Sqdns. in Action	Ac- tion Sor- ties	No. of Sqdns. in Action	Ac- tion Sor- ties	No. of Sqdns. in Action	Ac- tion Sor- ties	No. of Sqdns. in Action	Ac- tion Sor- ties	No. of Sqdns. in Action	Ac- tion Sor- ties	No. of Sqdns. in Action	Ac- tion Sor- ties
1941-December	4	21										
1942-January	3	13										
February	2	6										
May	2	6										
June	9	28										
July	2	4										
August	3	10										
September	4	8										
October	3	10										
November	1											
December	2	3										
1943-January	1	2										
February	4	16					1	18				
March	4	14					1	23				
April	2	5					1	4				
May	5	7										
June	2	8					1	4	2	38		
July	5	25					3	25	3	14		
August	4	10					2	17	3	5		
September	3	17					3	64	2	12		
October	3	35					5	51	5	61		
November	6	54					6	93	3	44		
December	9	63					6	96	5	54		
1944-January	6	145	1	2	2	17	5	100	7	96		
February	9	64	1	5	2	18	6	110	6	123		
March	6	125	1	1	1	5	7	63	5	256	1	129
April	3	62			1	6	5	116	5	169	1	142
May	5	107			1	21	8	82	6	302	2	153
June	6	63	2	6	1	5	6	87	4	152	1	141
July	3	54	1	4			6	97	5	81	3	182
August	5	73	1	2	1	19	8	104	6	212	4	233
September	6	94	1	1			4	46	6	96	4	333
October	3	73	1	1			5	84	7	105	4	322
November	6	58					8	105	7	105	6	655
December	3	39	2	22			6	145	4	141	6	685
1945-January	2	33	1	4			8	52	5	53	6	515
February	4	19	2	4			7	171	6	71	7	845
March	3	4	7	73			11	261	7	112	5	698
April	1	1	8	100	1	15	12	259	5	74	7	1020
May			7	133	1	24	14	408	4	178	7	1023
June	1	1	8	87	1	2	14	356	4	106	7	526
July			6	47	1	8	16	425	3	13	7	628
August			2	14	1	2	15	174	4	15	6	160
1941-42 Total		109		0		0		0		0		0
1943 Total		256		0		0		395		228		0
1944 Total		957		44		91		1,139		1,838		2,975
1945 Total		58		462		51		2,106		622		5,415
GRAND TOTAL		1,380		506		142		3,640		2,688		8,390

NOTE: No action by VPB aircraft was reported for March and April 1942.

NOTES TO TABLE 5

Among the items worthy of note in this table are the following:

- (a) The predominance of dive bombers, and the relatively small number of fighter sorties, in the carrier actions of 1942, resulting from the relatively low fighter complements of the time.
- (b) The transfer from the F4F to the F6F in the rebuilt carrier force of 1943, the gradual transfer from SBD to SB2C in 1944, and the decrease in SB2C use in late 1944 and 1945 as Complements changed to meet the kamikaze threat.
- (c) The slow emergence of the FM as an offensive aircraft, beginning in June 1944, after 6 months of primarily defensive use.
- (d) The sudden rise of the F4U as a major carrier aircraft in early 1945.
- (e) The predominance of the TBF as the primary carrier bomber from 1944 on.
- (f) The shift, in land-based aircraft, from the F4F to the F4U, and the later addition of the F6F. (Note that land-based F4F action sorties are probably seriously understated, because of inadequate reports of most of their offensive missions; the same applies, to a lesser extent, to land-based F4Us for 1943).
- (g) The decline and subsequent rise of land-based F6F combat activity. The decline resulted from the abolition of land-based Navy support squadrons in early 1944 (and the increasing problem of supplying a larger number of carriers with F6Fs). The later return of the F6Fs was as Marine land-based night fighters.
- (h) The decline in use of the land-based F4U in 1945, as carrier demands for fighters increased.
- (i) The persistence of the land-based SBD in combat until nearly the end of the war.
- (j) The withdrawal of the TBM from general land-based combat duty after the peak of the Solomons campaign, and its restriction to a few Marine squadrons engaged principally in local anti-submarine patrol and special support duties, including supply dropping.
- (k) The persistence of the PBV in combat (largely night attacks on shipping and by-passed Japs) until early in 1945.
- (l) The sudden expansion of PBM combat activity in March 1945 after 14 months of largely negative patrols.
- (m) The considerable volume of offensive activity by PB4Y patrols and anti-shipment missions in early 1945.
- (n) The diversion of PVs from offensive to more routine missions in 1945.
- (o) The sizeable offensive volume flown by the relatively small force of Marine PBJs.

NOTES TO TABLES 6 AND 7

These tables classify, by assigned mission of own aircraft at time of takeoff, all sorties which actually attacked or engaged the enemy. It should be noted that sorties which did not actually engage the enemy are not included; thus the bulk of defensive patrols, search and reconnaissance missions, and a relatively small number of abortive offensive sorties, are not reflected herein. The purpose of the table is to show the origins of the missions that resulted in action.

It has been necessary to make this presentation in two tables because of differences between the classification methods employed for 1944 and for other years. Table 6 presents yearly data by plane type, with a little less detail for 1944 because of inability to make the 1944 classifications fit those available for other years. Table 7 presents the expanded detailed classification available for 1944 only.

The following explanatory material will assist in an appreciation of the data in Table 6:

(a) Ground Support: The considerable increase in the volume of direct air-ground support missions flown by carrier aircraft from less than 15% of total action sorties in 1942-43, to over 20% of a greatly increased total in 1945, deserves notice. In the case of land-based VF and VSB-VTB the increase was from 2% in 1942 to over 30% in 1945. This reflects the increasing perfection of air-ground teamwork between Naval aviation and Army-Marine ground forces, - the function of direct air support having always been recognized as a primary mission of Naval and Marine aviation. The record of Naval aviation's destruction of such primary enemy strategic targets as aircraft and shipping indicates that this large volume of air-ground support was supplied with no loss of strategic effectiveness.

In fact the number of action sorties on missions classified in the Table as "Air-Ground Support" does not reflect the full weight of offensive put forth by Naval aviation, and particularly by the carrier forces, on behalf of ground forces. Carrier offensive missions were classified as air-ground support only when flown under the control of air support commanders. A number of pre-invasion offensive missions were flown against beach defenses, gun positions, and other ground targets, which were not controlled by air support commands, and are thus classified as strike or sweep missions.

Also, the bulk of the carrier VF action sorties listed under "Defensive Patrols Over Target or Other Forces" involved attacks by patrolling VF on enemy ground forces, under the direction of air support commanders, rather than merely defensive engagements with enemy aircraft. It was a normal practice for fighter combat patrols over invasion beachheads to carry bombs and rockets, and to report to the air support commander for assignment of targets on completion of the patrol period. It is estimated that a total of some 40-45,000 carrier action sorties, and some 20-25,000 land-based action sorties, were flown in effective direct support of ground forces.

(b) Search or Reconnaissance Missions: A noteworthy trend was the increasing displacement of carrier bombers by carrier VF on search missions. In part the large volume of carrier VF missions in this category in 1944 and 1945 reflects a vast increase in number of photographic missions, including escort fighters which often strafed guns and other targets. However, there was also an increased use of VF for sector search in place of VSB and VTB.

It should be noted that the action engaged in by most search action sorties was attack on targets of opportunity, rather than combat with enemy aircraft. Only 425 carrier-based search and reconnaissance action sorties out of 4,672, and 789 land-based (mostly VPB) out of 8,431, actually engaged enemy aircraft in combat (See Table 23). Some of those which engaged in combat, and all of the remainder, attacked land or ship targets in addition to carrying out their reconnaissance functions.

(c) Defensive Patrols: The increasing predominance, as the war advanced, of action by defensive patrols over invasion forces afloat and ashore, as against action restricted to defense of base, is clearly illustrated by figures for both carrier and land-based VF. In 1942 our fighters were devoting most of their defensive energies to warding off attacks on their own bases. By 1945 the bulk of the defense could be diverted to keeping the enemy from attacking other land installations or friendly forces.

The relative lack of defensive action by land-based VF in 1944 deserves notice. During

(Cont. on next page)