

AIR OPERATIONS TABLES PACIFIC: MAY – DECEMBER 1942

Readying. Aircraft carriers and bases ready aircraft using the following points system.

Aircraft type:	Handling points needed per AF:
Armed multi-engined aircraft	6
Other armed strike aircraft	4
Unarmed multi-engined aircraft	3
All other aircraft	2

Example: a CV with 12 handling points is preparing a strike of 6 dive bomber factors, 4 torpedo bomber factors, and 3 escorting fighter factors. The strike requires 46 handling points. The CV has 12 points per AOS available, and will spend 4 AOS readying the strike. If the CV reduced the strike size by 2 strike aircraft factors and 1 escort factor, she could ready the strike in 3 turns.

Strike organization. Strikes can fly to their targets by individual strike groups, by strikes organized from a single carrier's aircraft, or by strikes organized from the aircraft of more than one carrier in the same strike group. Larger strikes take longer to organize, and so the strike aircraft spend more time in the air while the strike is organizing.

Strike size:	USN, USAAF, USMC	NK
Single strike group	1	1
Single base or carrier	2	1
Combined bases or carriers	3	2

The table shows the delay in turns before the strike departs.

Delays for forming strikes are measured from the turn in which the last aircraft participating in the strike was launched. For example, if the last aircraft factor of a US single carrier strike launched in the 2nd turn, the strike departs 2 turns later, in the 4th turn.

Aircraft Deckload Limits. The air operations charts for carriers show the areas of the deck in which planes of different types and with different weapons loads must be placed for takeoff. These areas take into account the fact that heavier aircraft required more deck length to come up to takeoff speed. The size of these areas may limit the ability of a carrier to launch all aircraft on a strike in a single AOS.

Aircraft factors take up different amounts of deck and hanger space based on aircraft size. Sizes are shown on the carrier air operations sheets. Note that these size points are not the same as handling points.

Where aircraft in an area do not use all of the area, the unused size points can be used in the area next forward. For example, a carrier operations sheet has a 7 point area for dive bombers immediately behind a 5 point area for fighters. The carrier's dive bomber AFs have 3 size points; her fighters have 2. If the carrier has 2 dive bomber AFs in the dive bomber space (using 6 size points), he may have 3 fighter AFs in the fighter space (using the unused size point from the dive bomber space).

Example: The Japanese player decides to launch a strike from the Hiryu. He has no planes ready, but has 6 B5N torpedo bomber factors, 6 D3A dive bomber factors, and 3 A6M fighter factors available in Hiryu's hanger.

Consulting Hiryu's flight deck diagram, the player sees that he can only accommodate 5 torpedo-armed B5N factors at one time in the aftermost launch position. He decides to limit the strike to no more than 5 B5N factors to avoid having to launch the strike over more than one turn. He also sees that he has 8 handling points at his disposal per AOS and that the Hiryu's closed hanger spaces will require him to use 1 handling point to move an AF from the hanger to the flight deck. He uses his first AOS to arm and fuel 2 B5N factors. In his 2nd AOS, readies another 2 B5N. In his 3rd AOS he readies 1 more B5N factor and 1 D3A. In his 4th AOS, he readies another 2 D3A. In his 5th AOS, he readies 2 A6M, and moves 4 B5N AFs to the flight deck. In his 6th AOS, he moves the 6 final aircraft factors to the flight deck. He now has 5 B5N factors in the aft most area of the flight deck, 3 D3A in the area next forward, and 2 A6M in the foremost takeoff area. His total strike is 11 factors, which he can and does launch in the 7th AOS after he began to prepare the strike.

The strike now returns to land. While the strike has taken no losses, the Hiryu has taken 2 bomb hits while the strike aircraft were away. The hits knocked out the forward elevator and the flight deck ahead of it. Again consulting the Hiryu's air operations chart, the player sees that Hiryu usually has 21 points of space available forward, but that the bomb hits in the forward two-sixths of the deck has reduced this to 7 points. His returning strike would occupy 25 points of deck space, so he will have to strike some aircraft below before landing others. Because his aft elevator is in the space used for landing, he will rely on his midships elevator for this work.

In the first AOS, the player lands 2 D3A – 6 space points. He strikes them below. In the second AOS, the player lands 1 D3A and 2 B5N, then sending 1 D3A and 1 B5N below. This leaves him with 2 points on deck and 6 aircraft factors anxiously circling. On the next AOS, the player lands 2 B5N and sends 2 B5N below, leaving him with 1 B5N on deck. Next AOS, he lands 1 B5N and 1 A6M, sending 2 B5N below. In the 5th AOS, he lands the final 2 A6M on board.

SEARCHING PACIFIC: MAY – DECEMBER 1942

Search ranges and speeds:

Aircraft:	Range:	Speed:	Endurance:
B5N2 unarmed	7	Normal	27
E8N2 unarmed	6	Slow	33
E7K2 unarmed	4	Slow	15
E13A1 unarmed	7	Normal	28
SBD-2 w/ 500 lb	5	Normal	16
SBD-3 w/ 500 lb	6	Normal	20
TBF-1 w/ payload and 2 58g drop tanks	6	Normal	22

Range in hexes, endurance in turns.

Searching Mechanics:

When an opposing task force is in a hex being searched, roll D6. If the modified result is 1 or more, the task force is spotted and the searching player is dealt cards from the task force's card hand equal to the modified result.

The following modifiers apply:

- ± the searching side's initiative level
- 1 if the search is more than 7 hexes from the search mission's starting point
- 1 if the search is more than 15 hexes from the search mission's starting point
- 2 searching a hex with declared Allied CAP
- 1 clouds in the hex
- 2 storms in the hex
- +1 paired aircraft searching

Distance modifiers are cumulative. Cloudy weather modifier not used if the CAP modifier is used. CAP modifier cannot be used at night or in storms. If the CAP modifier is used and the modified D6 roll is allows the drawing of 2 or fewer cards, the task force is considered spotted but not shadowed.

***Example:** A USN search of 6 SBD-3 AFs armed with 500 lb bombs patrols with pairs of aircraft out to 6 hexes from its carrier. Because the 6 AFs are searching with paired aircraft, they search an arc of 180 degrees. An NK task force is located 4 hexes from the search mission's carrier. The search aircraft were launched on turn 4, and so the SBDs will search the NK task force (at a minimum) on turns 8, 9, 10, 11 and 12. On turn 8 the USN player rolls D6, modified by +1 for the paired searchers and -1 because the weather in the hex is cloudy. Rolling a 3, the USN player examines 3 cards from*

card hand of the NK task force. If the NK task force had been a dummy, the search result would have removed it. The USN search is armed, and so may attack ships of the types revealed by the cards that the USN player examined.

STRIKES LOCATING TARGETS PACIFIC: MAY – DECEMBER 1942

Strike Sighting Table. Strikes may not attack task force targets until they sight them, rolling **1D10** and using this table:

Distance	0-2	3-5	6-8	9-12	13+
Roll for sighting attempts	8	7	6	4	2
Roll to return	1	2	3	4	5

Roll upon the strike reaching its destination hex, based on the distance in hexes that the strike has flown from its beginning hex.

If the roll is a **10**, immediately roll an additional D10. If the result is equal to or less than the number shown in the applicable column the strike starts back to its carrier or base.

If the roll is less than or equal to the “Roll for sighting attempts,” the strike rolls to sight each task force in the destination hex and each hex adjacent to the destination hex. Roll separately for each task force.

A strike spots a task force on a value of **7** on the Hit Determination Table, as modified by the modifiers below. If a task force is spotted, the task force player deals **6** cards from that task force’s card hand to the strike player. Once all the sighting attempts are resolved, the strike may attack any one of the task forces spotted by the strike. The strike must attack one of the spotted task forces unless it unless the strike player rolls **5** or less on **D10**.

Modifiers to basic sighting value: **-3** for a task force in an adjacent hex
-1 if cloudy
-2 if stormy
-2 if twilight
-4 if night
+1 if the strike declares that it is in a scouting line,
but the value is **never less than -3**.

The strike attacks on turn following the turn of the roll if it is in scouting line.

Example: An NK strike has reached its target hex, 6 hexes from its starting hex. The USN player has 2 task forces in the hex and one in an adjacent hex. The NK player rolls a 10 on the Strike Sighting Table, but rolls better than a 3 in the next roll. While the strike doesn’t see anything, at least it doesn’t lose heart and go home.

In the next turn, the NK player rolls a 3, indicating that she may roll to see task forces in the strike destination hex and the hexes adjacent to it. There are 3 task forces in the area, 2 of which can be spotted with a –1 modifier (being in the strike destination hex but under cloud), and 1 with a –4 modifier (being in an adjacent hex and under cloud).

She only spots one task force and fails to spot the intended target of the strike. The cards she receives from the card hand of the spotted task force show only cruisers and destroyers. The NK player is after carriers and has some endurance left, so she elects to keep looking. She rolls D10 for a 3, confirming that the strike is not required to attack the force that it spotted.

On the third turn, the NK player rolls a 1. In the spotting die rolls, the NK player spots the task force that is the designated target for the strike. The strike attacks immediately.

MOVEMENT

Task force movement follows this schedule, based on the slowest ship in the task force.

Slowest ship speed is at least:	Movement in:
0.50 inches	15 th turn after initial plot
1.00 inches	8 th turn after initial plot
1.50 inches	5 th turn after initial plot
2.00 inches	4 th turn after initial plot
2.50 inches	3 rd turn after initial plot
4.00 inches or more	2 nd turn after initial plot

Movement rates shown are FOTW values. A task force's move must be plotted in advance, with the plot indicating the destination hex. If a ship in a task force launches an air search or strike mission, the task force may not move and any existing movement plot for it is canceled. Task force moves must be announced to opponents as they occur. Dummy task forces may move as well, with any need for plotting.

Aircraft moving at normal speeds move one hex every turn. Fast aircraft move an additional hex every turn evenly divisible by 6. Slow aircraft do not move on any turn evenly divisible by 4.

CAP ATTACK TABLES PACIFIC: MAY – DECEMBER 1942

Follow these steps when CAP attacks strike aircraft.

Allocation of escorts. The strike player secretly allocates escorts among the strike aircraft at the time that the strike is launched. Each escort AF is allocated to one of the strike groups present in a strike.

Number of CAP intercepting. The CAP player declares the number of CAP AF that will try to intercept a particular strike. Roll for each factor to see if it attacks. CAP that attempts to attack one strike but fails may attempt to attack other strikes in the same or subsequent game turns.

Base values: **8** for US CAP
9 for NK CAP

Modifiers: **-1** for CAP vectored from another task force in the same hex with the task force being attacked
 -1 for US CAP in twilight
 -3 for NK CAP in twilight
 -3 for NK CAP over ships unless at least 6 ships of formation are in the outer AA ring

Strike Composition. For US CAP, the CAP player rolls **D6**. On a roll of **1**, the strike player must announce whether the strike contains level bombers, dive bombers, or torpedo bombers. The strike player must announce whether each type is present, but does not reveal the number of each type present.

CAP intercept assignments. Once the number of CAP AFs engaging is determined, the CAP player designates the number of CAP AFs engaging (respectively), dive bombers, level bombers, and torpedo bombers. The CAP player does this without knowing the composition of the striking player's strike.

CAP fighting escorts. The strike player reveals the types of striking aircraft (dive bombers, torpedo bombers, and level bombers) but not the number of each type or the number of escort AFs with each type. The CAP player may announce that some or all of the CAP AFs assigned to attack level or dive bombers will attack torpedo bombers instead. The CAP player keeps these CAP AFs separate, as they will have a reduced chance of engaging the torpedo bombers before they attack. For CAP attacking strike aircraft with escorts, the strike player rolls for each escort AF to see if it engages a CAP AFs.

Base values: **4** for NK escorts engaging USN CAP
 8 for USN escorts engaging NK CAP

CAP AFs fighting escorts do not fight strike aircraft.

CAP and escorts fight immediately, rolling simultaneously against their air-to-air values to shoot down opposing aircraft on the Hit Determination Table. Roll against the adjusted attack value for each attacking AF. Each hit knocks down one enemy AF. Losses are taken immediately.

CAP fighting strike aircraft. Next, the striking player reveals whether the strike includes dive bombers, level bombers, or torpedo bombers. The CAP player rolls on the Hit Determination Table for each CAP AF that was allocated to attack a type of strike aircraft present in the strike. Each successful result indicates that the CAP factor attacks a strike AF of the appropriate type before the strike AF attacks its ship or land targets. CAP AFs allocated to intercept level bombers may make this roll for any dive bombers present in the strike, and vice versa

Base values: **7** for CAP engaging dive bombers or level bombers
9 for CAP engaging torpedo bombers

Modifiers: **-3** if the striker is an armed searcher
-3 if the CAP is committed from another task force in the same hex
-1 for USN CAP launched in the turn immediately before the turn of the strike or on the turn of the strike, and is attempting to intercept torpedo bombers
-3 if the CAP was launched in the turn immediately before the turn of the strike or on the turn of the strike, and is attempting to intercept dive or level bombers
-3 if the CAP was allocated to attack dive or level bombers but is attacking torpedo bombers instead

The CAP player and the strike player roll simultaneously against their respective air-to-air values to shoot down opposing aircraft.

The strike aircraft then attack their ship or land targets, rolling for hits and taking losses from antiaircraft fire.

After the strike aircraft have attacked, the CAP player attacks the strike AFs with any CAP that has rolled successfully to engage but has not yet fought. This CAP may attack any strike aircraft factors that the owning player wishes.

All CAP factors that engage the enemy must land, rearm, and either launch or be

designated as held on deck before they can fight again. CAP combat is considered to last throughout the turn in which a strike occurs.

CAP endurance and depletion. The CAP player reduces the endurance of any CAP AF that fought by **1**. The CAP player rolls on the Hit Determination Table for each CAP AF that fought to see if the CAP AF is depleted. A depleted USN CAP AF may take no further part in CAP combat. A depleted NK CAP AF engages in any further CAP combat with a **-6** modifier to its air-to-air attack values.

Base values: **8** for all USN CAP
9 for A6M CAP

A5M CAP does not deplete.

**AIRCRAFT TO AIRCRAFT ATTACK VALUES
PACIFIC: MAY – DECEMBER 1942**

Attacker↓	F4F	SBD-2 SB2U	SBD-3	TBD	TBF	PBY	B-26	B-17	P-39 F3A
A5M CAP	-2	-1	-3	0	-1	-4	-6	-9	1
A6M CAP	5	5	3	6	5	2	4	-3	7
A6M Escort	4	8	5	N	N	N	N	N	6
F1M CAP	-2	-3	-4	0	-4	-4	-6	-12	1
Japanese Defensive Guns	N	-4	N	N	N	N	N	N	N

Attacker↓	A6M	A5M	D3A	B5N	G3M G4M	H6K H8K	E8N E13A	F1M
F4F CAP	8	N	7	8	5	5	5	N
F4F Escort	5	5	N	N	N	N	N	9
P-39/F3A CAP	0	N	4	5	2	2	2	4
P-39/F3A Escort	2	2	N	N	N	N	N	6
SBD CAP	-3	0	4	5	2	2	2	4
US Defensive Guns	-4	-4	N	N	N	N	N	-4

Left column is type of aircraft attacking. Top row is type of aircraft being attacked. Number is hit number used by attacking aircraft. “Defensive Guns” refers to strike aircraft fighting defensively. “N” means no effect.

AA FIRE VALUES PACIFIC: MAY – DECEMBER 1942

Only Allied ships resolve AA fire. For IJN ships, those capable of AA fire prevent attacking aircraft from applying a favorable modifier to their attacks.

AA fire versus dive bombers:

Roll for each attacking AF before strike AF attack, based on the number of AA factors firing. AA factors committed to firing against dive bombers may engage all dive bomber AFs attacking in a turn. Reduce to **1/4** the value of all AA factors committed by screening ships. If FOTW rules are being used, a ship must be within 2.5 inches of the target ship for it to act as a screening ship.

AA Factors:	1- 2	2.25- 4	4.25- 6	6.25- 8	8.25- 10	10.25- 12	12.25- 15	15.25- 19	19.25- 24	24.25- 30	30.25+
HDT Value:	-5	-3	0	1	2	3	4	5	6	7	8

AA fire versus torpedo and level bombers:

AA factors not committed against dive bombers in an ASP may be fired at attacking torpedo or level bombers. Resolve the fire at the Hit Determination Value shown below, rolling once for every AA point committed. As with AA fire against dive bombers, reduce to **1/4** the number of AA factors committed by screening ships. The firing player may increase the relevant value below by **3** in exchange for making rolls equal to **1/2** the number of adjusted AA factors.

Time Period:	Value on Hit Determination Table:
12/7/1941-5/30/1942	-1
6/1/1942-7/31/1942	0
8/1/1942-9/30/1942	1
10/1/1942-12/1/1942	2

The following modifiers apply to all AA fire:

HDT Value Modifiers:	Modifier:
Firing in twilight	-3
Firing at night	-6
Firing versus level bombers	-6

Note: arcs of bearing are ignored for AA weapons. In the course of an attack, aircraft are presumed either to pass through all weapons arcs or to expose themselves to prolonged fire in one arc.

CAP and AA. If CAP follows strike aircraft into their attacks, roll for each loss inflicted on the strike aircraft by AA at a Hit Determination Table value of 0. A successful roll means that a CAP AF was shot down rather than the strike AF.

AIR TO SURFACE ATTACK VALUES AND MODIFIERS PACIFIC – MAY-DECEMBER 1942

These values are the hit numbers used on the Hit Determination Table to determine the number of hits scored by attacking strike aircraft. Roll **3 times** for each attacking factor.

Basic horizontal bomber to hit values:	-5
Basic IJN dive bomber to hit value	6
Basic USN/USMC dive bomber to hit value:	5
Basic IJN torpedo bomber to hit value:	4
Basic USN/USAAF torpedo bomber to hit value:	2

Modifiers (for all types of attacks):

Crew and Equipment Quality*:	-2 to +2
No AA opposition over target:	+3
CAP opposition over target**:	-2
Attacking in twilight	-3
Attacking at night	-6
Per inch of target's speed when target is moving 3 inches or more	-1
Target moving, but less than 3 inches	-1

*Where given by scenario rule

**AFs were attacked by CAP that elects to follow them into AA range

Modifiers (for dive and level bombing)

Target Size Table – Bombs

Target Type:	DE TB	DD	CL	CA CVL	BC	BB CV	AS	AM	AL CVE
Modifier:	-4	-3	-1	0	1	2	-2	-1	0

AF downed by AA: **-3**

Modifiers (for torpedo bombing)

Target Size Table — Torpedoes

Target Type:	DE TB	DD	CL	CA CVL	BC	BB CV	AL CVE	AM	AS
Modifier:	-1	0	1	2	3	4	3	2	1

Less than 3 AF of torpedo bombers attacking a ship in the ASP: **-2**

AF downed by AA: **-4**

Torpedo Bombing in FOTW: For attacks during a FOTW tactical engagement, use FOTW range, target size and target angle and target maneuvering modifiers. Minimum attack range is 1 inch.

STRIKE EXAMPLE

Hiryu sends a strike winging towards an American carrier task force. The strike consists of 3 AFs of A6M2 escorts, 2 of D3A1s with 551 lb HEI bombs (instantaneous fuses), 3 of D3A1s with 551 lb SAP bombs, and 4 of B5N2s with 17.7" torpedoes. It is heading toward USN TF 2, 6 hexes away. It lifts off Hiryu's deck on turn 5.

The NK player moves the aircraft counters to the Strike 1 area of the Hiryu's air formation sheet, and notes in the box the target of the strike (TF 2) and the last turn of normal endurance for each of the strike groups, and the strike AFs that will be accompanied by escorts – in this case, all with the torpedo bomber strike group. The strike takes one turn to organize, then starts moving towards its target on turn 6.

On turn 11, the NK player announces that a strike is in TF 2's hex and is trying to contact the task force. There are no other US task forces in or adjacent to TF 2's hex, so the NK player now rolls to sight the force, but without success.

On turn 12, the NK player rolls successfully to spot the task force and attacks. He tells the US player, who has 9 factors of F4F CAP airborne over the task force.

The players now go through the first part of CAP combat. The USN player rolls on the 9 column of the Hit Determination Table, and determines that 6 CAP factors can engage. She does not roll a 1 on D6, so she must allocate the CAP before knowing the composition of the strike. She allocates 3 factors against dive bombers and 3 against torpedo bombers.

The NK player announces that there are both dive bombers and torpedo bombers in the strike. The US player rolls to determine if her CAP will engage the D3As and B5Ns before they attack. She finds that 1 F4F AF will attack the D3As before they attack the ships, but that the other 2 will only attack after the D3As will bomb. The players resolve the F4F attack immediately, but no D3As fall.

The USN player then rolls to determine how many of the F4Fs detailed to go after torpedo planes will attack them before they can launch their torpedoes. All 3 of the CAP AFs will attack before the B5Ns can. The NK player announces that the B5Ns are escorted. Rolling for 6 attempts on a value of 4, he determines that 1 of the F4Fs is drawn off by the escorts.

The F4F AF and the 6 A6M AFs escorts fight, with the F4F AF rolling at a value of 3 and the A6Ms all rolling on a value of 4. The F4F AF is downed for no losses to the A6Ms. The other 2 F4F AFs attack the B5Ns at a value of 8, downing 2 AFs.

The NK player next rolls to determine the order in which his strike groups will attack. He determines that 2 factors of D3A will attack in the 2nd ASP, 3 factors of D3A in the 3rd,

and 3 factors of B5N in the 5th. Just what he had hoped – perhaps the D3As will suppress AA fire before the B5Ns sweep in.

Only now do the task force ships appear on their formation card. The NK player sees two carriers surrounded by escorting cruisers and destroyers. He selects the largest carrier (the Lexington, as it turns out) and starts the attacks.

The USN player stands to her guns and announces that CAP will harass the bombers as they attack. Totalling the AA factors for the Lex, plus one-quarter of the AA factors from the screen, the USN player determines that she has 12.25 points of AA.

In the 2nd ASP, the first NK dive bomber group of 2 AFs roars down. The USN rolls for 2 chances on the 6 column of the Hit Determination Table. She rolls a 27, shooting down one factor. She checks that it is the D3As that go down, not the harassing F4Fs. Both attack. The AF not hit by AA rolls for hits at a value of 2 – 6 plus 4 for the target's size less 4 for target maneuvering and 2 for CAP harassing the D3As as they dive. The AF hit by AA rolls at a value of -1, due to an additional -3 modifier for the AA fire. Rolling for 3 chances (because a factor consists of 3 aircraft) on the 4 column, the NK player makes – no hits! The AF hit by AA is removed from play.

In the 3rd ASP, the second group of NK hawks arrives. The USN player still rolls for 3 chances on the 6 column. Rolling an 01, she blows all 3 factors out of the air. Again, she checks to see that she hit the NK aircraft, not the CAP. All 3 D3A AFs still attack, but with a -3 modifier for the AA fire. This time an SAP bomb strikes home on Lexington. The 3 AFs are removed from play.

Now the USN player pauses to see what damage the bomb caused. It crashes into the starboard side light AA batteries abaft the stack, reducing Lex's AA factors by 1. There is no fire.

Now come the torpedo bombers, 3 factors strong. Now the USN player rolls for 11 chances on the -1 column. (Note that she could also have elected to roll 5 times on the 2 column and once on the -1 column.) This time, luck abandons the USN player and all 3 factors swoop in unmolested. The basic hit factor for IJN torpedo attacks is 4, with modifiers of +4 for the Lex's size, -2 for the harassing CAP, and -4 for the Lex's maneuvers. The NK player rolls for 9 chances on the 2 column, scoring 2 hits.

The USN player then checks to see the results of the torpedo hits. One hits from starboard at the extreme stern, doing no real damage, but the other slams into the port side at location 54, flooding the aft motor room. The Lady avoids a fire or explosion, but her speed falls to 2.75 inches.

The remaining USN CAP factor attacks after the strike planes do their worst, downing another B5N factor. The NK strike withdraws, with the NK player noting that the strike has expended an extra turn of endurance in combat and the US player noting that 6 factors of her CAP have also expended an additional turn of endurance. She also

checks to see if the 5 surviving CAP factors have depleted their ammo, rolling on the 8 column of the Hit Determination Table 5 times.

BOMB DAMAGE TABLES

Bomb Hit Locations Table (D6)

	HEI	HED pen armor	HED n-pen armor	HED no armor	SAP pen armor	SAP n-pen armor	SAP no armor	AP pen armor	AP n-pen armor	AP no armor
High	1-6*	1	1-4	1	1-2	1-6	1	1	1-6	1
Low	--	2-3	--	2-3	3-5	--	2-4	2-5	--	2-3
Both	--	4	--	4	6	--	5	6	--	4
Mine	--	5-6	5-6	5-6	--	--	--	--	--	--
NE	--	--	--	--	--	--	6	--	--	5-6

*See special rules below for HEI-fused bombs.

Bomb hit procedures. Because the effects of bomb hits varied considerably depending on the type of bomb and whether the bomb penetrated armor at the point of the hit, determining the effect of bomb hits is a bit more complicated than determining the effect of gunfire hits. Determine the hit location by rolling 2D6 and reading the result as 11 through 66, then roll 1 D6 on the Bomb Hit Locations Table. For high hits on carriers, roll a third D6, with 1 indicating a left hit, 2-5 a center hit, and 6 a right hit.

- HEI means high explosive bombs with instantaneous fuses; HED means high explosive bombs with delay fuses; SAP means semi-armor piercing bombs; AP means armor piercing bombs. IJN HE bombs are HEI fused; USN HE bombs are HED fused.
- HEI bombs never penetrate armor, although they may shock equipment behind armor through the Shock Effects Table. HEI bombs make no penetration roll.
- For other bombs, roll 1D6 to determine whether the bomb penetrates armor. The bomb penetrates if the roll is less than or equal to the penetration of the bomb less the armor rating at that location.
- Bombs that fail to penetrate high armor at a hit location cause only shock damage and damage through mining hits. Roll on the Bomb Damage Locations Table, but only to determine if the bomb has a mine effect. Otherwise, resolve only shock damage for the bomb.
- In the Bomb Hit Locations Table:
 - “armor” indicates results if the bomb hits a location with low armor.
 - “pen armor” indicates results if bomb penetrates the low armor at that location.
 - “n-pen armor” indicates results if bomb does not penetrate the low armor at that location.
 - “no armor” indicates results if there is no low armor at the location hit by the bomb.
 - “High” means a high hit.
 - “Low” means a low hit.
 - “Both” means both a high hit and a low hit in the same location.
 - “Mine” means the bomb has exploded under water close to the target, creating a mining effect similar to a torpedo hit. For bombs of 400 to 800 lbs, treat this as an 18” torpedo hit. For bombs between 800 and 1200

lbs, treat the hit as a 21" torpedo hit. For bombs of 1200 lbs or more, treat this as a 24" torpedo hit. Dice to determine the ship side hit.

- "NE" means that the bomb has no effect.

Bomb Penetration and Flooding (D6)

Bomb Type and Size	Penetration	Flooding
25-200 lb HE	0	6
200-400 lb HE	0	5-6
400-800 lb HE	1	5-6
800-1200 lb HE	2	4-6
1200+ lb HE	3	3-6
200-400 lb SAP	2	4-6
400-800 lb SAP	3	3-6
800-1200 lb SAP	4	2-6
1200+ lb SAP	5	2-6
400-800 lb AP	4	5-6
800-1200 lb AP	5	4-6
1200+ lb AP	6	3-6

Roll 1D6 for flooding for low hits. For SAP and AP, -1 to penetration for dive bombing attacks. Note: Bombs are never effective against armored locations (other than by shock effects) unless their penetration value adjusted by the location's armor value is 1 or more.

Excess Damage Table

Bomb Type and Size	DD, DE, TB, AS	CL, CVE, AM	CA, CVL, AL	BB, BC, CV
75-200 lb HE	+1			
200-400 lb HE	+1	+1		
400-800 lb HE	+1	+1	+1	
800-1200 lb HE	+2	+2	+1	+1
1200+ lb HE	+3	+3	+2	+1
200-400 lb AP/SAP	+1			
400-800 lb AP/SAP	+1	+1		
800-1200 lb AP/SAP	+1	+1	+1	

Bomb hits can cause excess damage just like large shells. This table shows the additional number of locations affected by a bomb hit, based on the type and size of the bomb and the nature of the target.

HEI Hits on Carriers. HEI hits on carriers receive special treatment. The following rules apply to these hits:

- A 100 lb or 132 lb bomb hit affects **+1** location on a carrier. A 551 bomb hit affects **+1** locations on a carrier.

- When making the third die roll for a hit's location, a roll of **2** is treated as a hit in both locations **1** and **2**, while a roll of **5** indicates a hit affecting both locations **4** and **5**.
- HEI fused bombs never damage a carrier's hanger or flight deck. They do destroy any aircraft in a flight deck location affected by them. They also jam any elevator in a flight deck location affected by them, subject to repair through damage control.

Expanded Fire and Explosion Table (D10)

Hit Type:	Fire	Explosion
Magazines	3	Yes
Main Gun Mounts	2	Yes
Other Gun Mounts	2	No
AAMGs	2	No
Torpedo Mounts	2	Yes
Torpedo Reloads	2	Yes
Fuel Oil	3	No
Aviation Gas	5	No
Carrier Av Gas	6	Yes
Unreadied Aircraft	2	No
Readied Aircraft	4	No
Armed Strike Aircraft	8	Yes
Hanger (Poor)	4	No
Hanger (Fair)	2	No
Hanger (Good)	1	No

Roll 1D10 for each listed location struck. A fire results if the number rolled is equal to or less than the number shown on the table. If a fire starts at a location where an explosion can result, roll 1D10. On a **1**, an explosion sinks the ship. A gun mount hit never results in an explosion if the mount's magazine is flooded.

Spaces already flooded when they are hit do not burn or explode. The likelihood of hanger fires depends on their fire suppression systems. These are rated as poor, fair, or good. Carrier aviation gas burns more readily and explodes because carriers carried much more gas than other ships.

Shock Effects (D36)

Large HE bombs can also cause shock effect hits. 400-800 lb HE bombs cause shock effects as if they were 18" torpedoes, 800-1200 lb HE bombs as if they were 21" torpedoes, and 1200+ lb HE bombs as if they were 24" torpedoes.

Fire On The Waters Aerial Torpedo Characteristics

Torpedo Type	Warhead	Speed	Range	Max Value
NK T91	18"	5.25"	2.25"	9
USN Mk13 early	22", as 18"	4.25"	6.00"	6
USN Mk13 late	22", as 18"	4.25"	6.25"	8
RN MkXII	18"	5.00"	1.5"	8
(slow)	18"	3.25"	3.50"	8
RN MkXV	18"	5.00"	2.50"	8
(carrier)	18"	4.00"	3.50"	8
RM Fiume W/Naples SI	18"	5.00"	3.50"	8
RM Circling	18"	1.75"	16"	8

These torpedo characteristics are used when torpedo bombers attack during a Fire on the Waters tactical engagement.

**AIRCRAFT LOADS AND ENDURANCE
PACIFIC: MAY – DECEMBER 1942**

Nihon Kaigun

Type	Load	Missions	Endurance	Speed
A5M4	Clean	F	12	Normal
A6M2	Clean	F	20	Fast
A6M2	77ig drop tank	F	34	Fast
D3A1	551lb bomb	F*, D	21	Normal
D3A2	551lb bomb	F*, D	17	Normal
B5N2	Unarmed	S	27	Normal
B5N2	17.7" torpedo	T	21	Normal
B5N2	1762lb bomb	L	24	Normal
B5N2	6 x 112lb bomb	L	26	Normal
F1M2	Clean	F*, S	10	Normal
E8N2	Clean	S	33	Slow
E7K2	Clean	S	16	Slow
E13A1	Clean	S	28	Normal
H6K4	Clean	S	65	Normal
H6K4	2 x 17.7" torpedoes	T	32	Normal
H8K1	Clean	S	61	Fast
H8K1	2 x 17.7" torpedoes	T	30	Fast
G3M3	Clean	S	47	Fast
G3M3	1 x 17.7" torpedo	T	23	Fast
G3M3	2 x 551lb bombs	L	35	Fast
G4M1	Clean	S	45	Fast
G4M1	1 x 17.7" torpedo	T	24	Fast
G4M1	2 x 551lb bombs	L	35	Fast

Fighters, dive bombers and torpedo bombers use an additional turn of endurance in the turn in which they attack. Missions: F = fighter, F* = fighter (CAP only), D = dive bomber, S = search, T = torpedo bomber, L = level bomber

**AIRCRAFT LOADS AND ENDURANCE
PACIFIC: MAY – DECEMBER 1942**

USN, USMC, USAAF				
Type	Load	Missions	Endurance	Speed
F2A-3	Clean	F	14	Normal
F4F-3	Clean	F	13	Normal
F4F-3A	Clean	F	14	Normal
F4F-4	Clean	F	11	Normal
F4F-4	42g drop tank	F	16	Normal
F4F-4	58g drop tank	F	17	Normal
F4F-4	2 x 58g drop tanks	F	19	Normal
SBD-2	1 x 500lb bomb	S, D, F*	16	Normal
SBD-2	1 x 500lb, 2 x 100lb bombs	D	15	Normal
SBD-2	1 x 1000lb bomb	D	13	Normal
SBD-3	500lb bomb	S, D	20	Normal
SBD-3	500lb, 2 x 100lb bombs	D	18	Normal
SBD-3	1000lb bomb	D	16	Normal
TBD-1	22" torpedo*	T	14	Normal
TBD-1	2 x 500lb bombs	L	20	Normal
TBF-1	22" torpedo*	T	17	Normal
TBF-1	4 x 500lb bombs	S, L	17	Normal
TBF-1	22" torpedo*, 2 x 58g drop tanks	T	22	Normal
TBF-1	4 x 500lb bombs, 2 x 58g drop tanks	S, L	22	Normal
PBY-5	Clean	S	55	Slow
PBY-5	4 x 500lb bombs	L	54	Slow
PBY-5	4 x 1000lb bombs	L	46	Slow
PBY-5	2 x 22" torpedoes*	T	41	Slow
P-39	Clean	F	8	Fast
B-17E	4 x 500lb bombs	S, L	33	Fast
B-26A	1 x 22" torpedo*	T	13	Fast
B-26A	6 x 250 lb bomb	L	18	Fast

Fighters, dive bombers and torpedo bombers use an additional turn of endurance in the turn in which they attack. Missions: F = fighter, F* = fighter (CAP only), S = search, D = dive bomber, T = torpedo bomber, L = level bomber

*Treat 22" torpedo as an 18" torpedo for damage purposes.

DAMAGE CONTROL

Ships make damage control attempts at the start of each ASP (if their task force is being attacked in that turn) or in the Damage Control Segment (if their task force was not attacked in the previous turn). The procedure is slightly different depending on whether the damage control attempt takes place in an ASP or in a Damage Control Segment.

Damage control in ASPs.

ASP Damage Control Table (D10)

Navy	Damage repaired or fire put out	Damage becomes permanent or an additional fire starts
United States Navy	1-3	9-10
Other Allied	1-2	9-10
Nihon Kaigun	1-2	9-10

Each damaged ship may make one **D10** roll to repair damage or extinguish a fire, and must make one **D10** roll for each fire to see if more fires start. One fire roll may be also be used as a damage control roll to attempt to put out the fire. A low result on a roll repairs damage or puts out a fire; a high result make the damage permanent or starts another fire.

Damage control in Damage Control Segments.

Damage Control Segment Damage Control Table (D10)

Navy	Damage repaired	Damage becomes permanent	Fire put out	Additional fire started
United States Navy	1-6	7-10	1-9	10
Other Allied	1-5	6-10	1-8	9-10
Nihon Kaigun	1-5	6-10	1-6	7-10

Modifier: **+1** for each firing burning beyond one, to any roll to put out a fire.

Each ship may make up to 2 damage control die rolls in each segment. If a ship has any fires burning, it must make at least one roll to put out a fire (and so risk additional fires).

HIT RESOLUTION TABLES (D100)

Hit Numbers 10 to 18

10	11	12	13	14	15	16	17	18
1	1+4	1+8	2	2+7	3+2	4	5	6+5

Top number is hit number. Left bottom number in cell is number of hits per mount automatically scored. Right bottom number in cell (if any) is hit number for 1 additional hit per mount.

Hit Numbers -7 to 9

	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	
1	1	02	03	03	04	05	06	08	10	13	15	20	25	30	40	50	65	80
2	1	04	05	06	08	10	12	15	19	24	28	36	44	51	64	75	88	96
	2							01	01	02	02	04	06	09	16	25	42	64
3	1	06	08	09	12	14	17	22	27	34	39	49	58	66	78	88	95	99
	2					01	01	02	03	05	06	10	16	22	35	50	71	96
	3											01	02	03	06	12	27	64
4	1	08	10	11	15	19	22	28	34	43	48	59	68	76	87	94	98	**
	2			01	01	01	02	03	05	08	11	18	26	35	52	69	87	97
	3								01	01	03	05	08	18	31	56	82	
	4												01	03	06	18	41	
5	1	10	11	14	18	23	27	34	41	50	56	67	76	83	92	97	**	**
	2		01	01	01	02	03	05	08	13	16	26	37	47	66	81	95	99
	3							01	02	03	06	10	16	32	50	77	94	
	4										01	02	03	09	19	43	74	
	5												01	03	12	33		
6	1	11	13	17	22	26	31	39	47	57	62	74	82	88	95	98	**	**
	2	01	01	01	02	03	05	08	11	18	22	34	47	58	77	89	98	**
	3							01	02	03	05	10	17	26	46	66	88	98
	4									01	02	04	07	18	34	65	90	
	5												01	04	11	32	66	
	6														02	08	26	
7	1	13	16	19	25	30	35	44	52	62	68	79	87	92	97	99	**	**
	2	01	01	02	03	04	06	10	15	23	28	42	56	67	84	94	99	**
	3						01	01	03	05	07	15	24	35	58	77	94	**
	4								01	01	03	07	13	29	50	80	97	
	5											01	03	10	23	53	85	
	6													02	06	23	58	
	7														01	05	21	

Compute and roll for hits based on numbers of gun mounts firing (or torpedoes launched). Row is percentage chance of hitting, left-most column is number of mounts firing, second left column is number of rounds hitting. Roll indicated number or less on D100 to score indicated number of hits based on number of mounts firing and percentage chance of each mount hitting. For ships with different numbers of guns per mount, make one roll for each type of mount. For torpedoes, roll mount by mount, based on the number of torpedoes fired from the mount

Hit Numbers of -20 to -8

	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8
1								01	01	01	01	01	02
2					01	01	01	01	01	02	02	03	03
3				01	01	01	01	02	02	02	03	04	05
4		01	01	01	01	01	02	02	02	03	04	05	06
5	01	01	01	01	01	02	02	03	03	04	05	06	08
6	01	01	01	01	02	02	02	03	04	05	06	08	09
7	01	01	01	01	02	02	03	04	04	06	07	09	11

Only one hit is possible. Left-most column is number of mounts firing (or torpedoes launched).

ANTIAIRCRAFT VALUES

RN					
3 in.	-9M (1.3%)	4 in.	-5H (3.2%)	5.25 in. twin	-1V
2 pdr	-1L	4 in. twin	-2H	4.5 in. twin	-1H
20mm	-4L (4.0%)	.50 in.	-6S (2.5%)	40mm	-1M (7.9%)
KM					
10.5 cm twin	-2V	8.8 cm twin	-4H		
20mm	-4L	37mm	-4M		
USN					
5"/25	-5M (3.2%)	5"/38	-4H (4.0%)	5"/38 twin	-1H (7.8%)
1.1"	-2M (6.3%)	20mm	-4L	40mm	0M (10%)
NK					
5 in.	-4H	4.7 in.	-5H	3.9 in. twin	-3
5 in. twin	-1H				
25mm	-3L (5.0%)	25mm (3)	-5L	13.2mm	-6S
RM					
10 cm	-3	8.8 cm twin	-4		
20mm	-7L	37mm	-1M		

Note: Light AA values are based on groups of 4 barrels, unless otherwise noted. For each type of gun mounted, use these values to determine the number of 10% chances that the gun battery has of downing an aircraft. Each of these 10% chances is an "AA point." Compute AA points for each type of AA weapon mounted by a ship.

[Consider varying values to take into account fire control differences. Note that US values yield historically accurate results using the method described.]

Now obsolete – new values are essentially 0.1 AA point per gun for all guns except 40mm, which is 0.3 points per gun, with fire control mods based on period and fire against DBs taken per DB AF attacking. Slight discount for 5"/25. AA points undifferentiated by range of gun. IJN fire is simply present/absent.

Air-to-air ratings and interception rates now based directly on historical analysis, with a few exceptions:

- Pre-attack USN CAP interception rates for dive bombers higher due to mechanic of allocating CAP between dive bombers and torpedo bombers in advance of knowing strike composition.
- IJN escort chances of engaging USN CAP half of historical rates, but USN CAP AtA ratings when engaging IJN escort twice historical rates – in reality, IJN escorts engaged twice the number of USN CAP but they still killed strike aircraft at half the rate of unengaged CAP while also killing CAP at half the rate shown.
- Did not adjust A6M CAP kill rates upwards to take into account mechanic of CAP running out of cannon ammo. Escort A6Ms would almost always have been carrying their full cannon load, while CAP A6Ms could have run out even in their

initial combats (in game turns). Also did not adjust kill rates for USN CAP depletion mechanic for USN CAP.