8 January 2021

Harpoon V **Errata**

Page 3-1, add this text to the end of 3.1.1.

"Speed changes ordered in the Plotting Phase of a Tactical Turn happen immediately. For example, if a Fast A-sized ship at 20 knots is ordered to increase speed to 30, its acceleration of 6 knots means that it will move at a speed of 26 knots in the upcoming Movement Phase.

Players can ignore acceleration and deceleration in movement for Intermediate Turns."

Page 4-5, the example in section 4.7.6 is incorrect. Please change it to:

"Example: A jet fighter will fly 200 nmi to its target. It will fly 150 nmi cruising at High altitude, then 25 nmi at Low altitude to avoid radar and then the last 25 nmi at full power because it can't avoid that part of the radar coverage. It will return at cruise speed at High altitude.

It's best to break up the route into legs:
Leg 1: Fly 150 nmi High@cruise = 150 nmi
Leg 2: Fly 25 nmi Low@cruise = x2 (altitude) = 50 nmi
Leg 3: Fly 25 nmi Low@FMP = x2 (alt), x3 (FMP) = 150 nmi
Leg 4: Fly 200 nmi back High@cruise = 200 nmi

Mission range: 150 + 50 + 150 + 200 = 550 nmi is required, although the distance there and back is only 400 nmi.

The plane has a Cruise range of 400 nmi, but it can carry two drop tanks, which add 100 nmi each, which means it can now fly the mission."

If read quickly, the example could mean the low leg of 50 nmi was followed by a low, fast leg of 25 nm. This is not correct.

Page 5-4, section 5.2.8 Radar Line of Sight, in the second paragraph, on the next to last line, change "65 nmi" to "60 nmi."

Pg 5-5, right column, 1st paragraph, 2nd line
Replace: Wind speeds greater than 20 knots are too…
With: Wind speeds greater than 30 knots are too…

Pg 5-5, right column, Modifiers
Add: Wind speeds ≤10knots: -20

Pg 5-6, left column, Surface Duct Probability Table
Change: Summer probability from 30% to 20%

Pg 5-6, left column, Surface Duct Probability Table modifiers
Change: Hot climate locations: +20% to Hot climate locations: +10%
Change: Cold climate locations: -20% to Cold climate locations: -10%

Pg 5-6, right column,7th paragraph

Replace paragraph with:

Russian targeting complexes ("SS-T" type systems) have very fine bearing resolution that improves their ability to detect radar emitters from further away. Their ES multipliers against different radar types are increased by the following modifiers.

Long Range AS radars (150 nmi or more): +0.7
Medium Range AS radars (<150 nmi): +0.4
LAS/Surface Search radars: +0.3

All radars are more detectable in a ducted environment as at least some of the RF energy gets trapped in a duct. Thus, atmospheric ducting effects will also apply to ES system ranges (see 5.2.9.5).

Page 5-8, in the sidebar on sonar frequency bands in *Harpoon*, In the third paragraph, the frequency band used by a sonar for active search will not be bolded, but marked with a superscript "a." For example, For example, an LM-F[a]-MF sonar can listen in the LMF and MF frequency bands but transmits only in the LMF band.

Page 5-8, in the section on 5.4.2 towed arrays, in the fifth paragraph (active towed arrays), on the fifth line, change "5.2.4.1" to "5.4.2.1."

Page 5-13 and 14, section 5.4.6.2 Passive sonar detection. Change the last sentence in the first paragraph (on 5-14) from "The maximum modified probability of detection is 95%." to "The maximum modified probability of detection is 90%."

Page 5-25, in section 5.8 Visual detection, delete the last paragraph, beginning with "Formations of aircraft..."

Page 6-1, section 6.1 Combat systems. In the second line, change "ship" to "platform." In the fourth line, change "ship" to "unit." The kill chain applies to aircraft launching missiles, as well as ships and subs.

Page 6-2 Fire Control Solutions Tables, in the section for RF Solution Modifiers (on the right), under the lines for Passive Mod and Active mod, add a line: "Combat aircraft have a combat system modifier of zero."

In the same section, add the modifier "Information passed by a data link: +1"

Pg 6-5, left column, 6.3.3 Cross-fix, 1st paragraph

Add at the end: A cross-fix requires participating ships to have at least near-real time data links.

Pg 6-5, left column, 6.3.3 Cross-fix, 2nd – 4th paras

Replace paragraphs with:

• 1st and 2nd Gen ES system have poor bearing resolution and passive cross-fixes are less accurate. Ships attempting a cross-fix use the Active RF Table (pg 6-3) but reduce the solution quality by one level.

• 3rd and 4th Gen ES system bearing resolution while better than earlier ES systems are still wide and the information is not automatically integrated. Ships attempting a cross-fix use the Active RF Table solution without modification.

• 5th and 6th Gen ES system bearing resolution have narrower beam widths but information is not automatically integrated. Ships attempting a cross-fix use the Active RF Table but increase the solution quality by one level.

Pg 6-5, right column, 1st paragraph, 3rd line

Change: …very fine bearing resolution (less than 0.5°) and the …

To: …very fine bearing resolution (≈0.5°) and the …

Page 6-6, Rules change; replace section 6.3.10 Sharing Contact Information Without Data Links, including the example, with "Active sensor (usually radar) contact data can be shared by an aircraft or ship by means of voice, teletype, or other form of radio transmission to another platform. As this is raw location data only, and not a fire control solution, the best solution quality that can be obtained by the receiving unit, based on the sent information is Poor."

Page 7-1, section 7.4. At the end of the third paragraph, add "The defensive decoys deployed by ships include both radar and IR decoys."

Page 8-3, section 8.1.3 The Three-Second rule. In the table, on the line for 66mm or more, change the value for 751 - 1525 knots from 20% to 10%, and the value for 1526 knots from 10% to 20%. The chance to hit should be higher as speed increases.

Page 8-4, there are several changes to the tables on this page.

- On the Target Size Modifier Table, change the modifier for Large aircraft from +1 to 0.
- The Combat System Modifier Table now has separate columns for aircraft and missiles.
- On the Target Modifiers table, delete the :Manned Aircraft +3.0" modifier.
- The Antiair Missile Countermeasures table has been replaced by a new one, with adjusted values and a new row for 5th Generation missile seekers.

~~A new page 8-4, with the revised sections marked in red, is included on the last page~~
Note: This has been replaced by a new set of tables, which have been moved to 8-8 in the 1 Jan 21 update.

Page 8-12, clarification: At the end of the third full paragraph, just before the Gun Damage Multiplier table, add the following sentence: "Rotary guns (listed as "(R)") are counted as single barrels. Their rate of fire is already included in their damage values."

Pg 9-5, right column, 9.7.3 Air Attack Procedure., 3rd paragraph
Add at the end of the paragraph:
Unguided ordnance attacks are then resolved.

Page 9-5, section 9.7.4, in the Lob-Toss Bombing section, at the end of the second paragraph, add "Conventional unitary unguided ordnance cannot be lob-tossed against moving targets."

Pg 9-6 Unguided Ordnance Attack Tables, Lob-Tossing Column
Change A-size Base Ph from 24% to 12%
Change B-size Base Ph from 14% to 10%

Page 14-4, section 14.1.6 Effects of Armor. In the bullet point for bombs, at the end of the second paragraph, add: "Lob-toss attacks are treated as Medium-altitude glide bombing for penetration."

Page 14-4, section 14.1.7 Armor and Underwater Attacks. In the first bullet point, change "Torpedoes can be set to run ..." to "Contact-fuzed torpedoes can be set to run ..."

Page 14-5, still section 14.1.7, in the torpedo protection bullet point, change "contact-fuzed torpedoes" to "contact-fuzed torpedoes set to run deep."

Thanks to Stephane Abs, Norm Lunde, Francis Marliere, M.G. Park, and William Seney.

All of the above corrections were included in the 1 October .pdf upload of the rules. The following errata were collected afterwards.

Page 3-3, section 3.1.4, in the last paragraph, on the 11th line, change the acceleration of the B/Medium-sized ship from 5 knots to 2. The acceleration value is halved because the ship made a 45° turn.

Page 3-7, section 3.2.4 Diesel Submarine Battery Endurance. In the fifth paragraph (the example), change "122 (out of 200)" to "122 (out of 200 (new))."

Page 5-2, section 5.2.2 Size of contacts. Throughout the fifth paragraph, change "formation" to "group."

Page 5-5, Radar Clutter Values tables, in the first table, in the right hand column, change "Ship LAS," to "Ship AS, LAS."

Page 5-6, section 5.3 Electromagnetic Support, in the first example in the right column, change "...are increased by the following modifiers" to "...are increased by the following modifiers. These apply to both ducting and non-ducting conditions:"

Page 5-6, section 5.3 Electromagnetic Support, in the second example in the right column, change "for a long range search radar" to "for a long-range air search radar."

Page 5-13, section 5.4.6 Sonar Detection. Insert a new sentence: "... are similar. Generation 1-4 sonars have to choose which mode they will operate in for a given Tactical Turn. Generation 5 and later can use both modes within a single Tactical Turn. For each mode..."

Page 5-14, section 5.6.4.3 Sonobuoy Detection. In the right column, in the bullet point for search patterns, in the third paragraph (still with me?), change "+10%" to "+15%."

Page 5-20, section 5.7.1 Magnetic Anomaly Detection, in the paragraph starting "If a MAD search is made..." add this sentence at the end: "Western ASW aircraft do not use MAD as a search sensor; it is used only after a submarine contact has been detected and localized by sonar, radar, or visual means."

Page 5-24, Replace the outdated Visual Signals Range table with this updated version:

Visual Signals Range (kyds)

	Daytime Flashing Range	*Nighttime Flashing Light Range*	*Light Range*
Visibility	*(in Kyds)*	*(in Kyds)*	*(in Kyds)*
100%	8.0	16.0	--
90%	7.2	14.4	--
80%	6.4	12.8	--
70%	5.6	11.2	--
60%	4.8	9.6	--
50%	4.0	8.0	20.0
40%	3.2	6.4	20.0
30%	2.4	4.8	20.0
20%	1.6	3.2	20.0
10%	0.8	1.6	20.0/10.0*
5%	0.4	0.8	5.0*
2%	0.1	0.3	2.0*

* - Reduced signal range due to nighttime precipitation.

Page 6-3, section 6.3 Fire Control Solutions. In the second paragraph, change "Any weapon launched from a ship or submarine that takes more than one turn to reach its target requires a fire control solution before it can be launched." to "Any weapon that takes more than one turn to reach its target requires a fire control solution before it can be launched." The requirement applies to weapons launched from any kind of platform.

Page 7-2, in section 7.4.2 (starts on page 7-1), in the IR Guidance bullet point, at the end of the section, after fourth generation IR seekers, add a new paragraph:

"All IR-homing missiles ignore defensive jammers, unless they are listed as IR jammers. They are affected by decoy countermeasures, which have both flares and chaff."

Page 7-4, change the explanation on terminal maneuvers to "In the turn these missiles attack their target, they will radically maneuver so they are a harder target for air defense systems. Unlike a popup, they do not change altitude. Use the modifier to terminal maneuvers." - remove the reference to treating missiles with terminal missiles as crossing targets.

Page 8-1, left column, step 4), Intercept range, clarification of the exception: change "(*exception:* SAMs with a range of 15 nmi or less do not need a 3D or HF radar)" to "(*exception:* SAM engagements at ranges of 15 nmi or less do not need a 3D or HF radar)."

Page 8-1, left column, step 5), SAM Range check, change "See if the bogey is inside Intercept Range. The range depends on the bogey's speed. The shooter gets a bonus against very fast targets. If a non-maneuvering target's speed is 2,001 knots or more, the Intercept Range is twice the SAM range listed in Annex D.

If a non-maneuvering target's speed is 2,001 knots or more, the Intercept Range is twice the SAM range listed in Annex D.

If the missile's speed is 501 - 2,000 knots, the Intercept range is 1.5 times the listed SAM range."

to:

"See if the bogey is inside Intercept Range. The shooter may get a bonus against very fast targets with converging or closing geometry.

If a converging non-maneuvering target's speed is 2,001 knots or more, the Intercept Range is twice the SAM range listed in Annex D.

If the converging target's speed is 501 - 2,000 knots, the Intercept range is 1.5 times the listed SAM range."

Page 8-1, right column, on step 9) Chance to Hit, change the sentence to read: "Subtract the bogey's Maneuver Rating from the missile's ATA rating and apply any modifiers. The final value is the Missile Index that is cross-referenced in the Anti-air Missile Attack table on page 8-4 to obtain the probability of hit for a single weapon or two weapon salvo."

Page 8-4, section 8.1.3 Air Defense Gunnery. At the end of the second paragraph, starting "All air defense guns fire at targets..." add the fellowing sentence: All air defense guns of 65mm or less, including those in local control, will get at least one shot at air targets in this band. This assumes the ship is at general quarters."

Page 8-4, Combat System Reaction Time table. Change the column header from "Normal Delay" to "Normal Delay (Increments)."

Page 8-9, Antiair Gun Modifiers to AA Strength, on the section for Target maneuvers, change the modifier for Crossing targets from -3 to -4.

Page 9-1, section 9.4.1 Gaining position, (rules change): In the table for gaining position, change the modifier for the difference in Maneuver Rating from 20% to 5%. Change the example that follows on page 9-2, to

"*Example:* An attacking F-4E has a Maneuver Rating of 2.5, and its FMP speed at high altitude is 920 knots. A MiG-23BN's Maneuver rating is 3.0, and its speed at High altitude is 911 knots. The attacking player rolls D100 and gets an 83, but must subtract 2.5 (rounded to 3) because of the difference in maneuver rating. The result is 80, which puts him in position to fire a wide-angle missile like an AIM-9E or a narrow-aspect missile like the AIM-9B."

Page 9-3, section 9.5 AAM Attacks, change "Aircraft can attack each other with AAMs ..." to: "Aircraft can attack other air platforms (e.g. aircraft, UAVs, missiles) with AAMs ..."

This changes the procedure to include the modifier for a fighter's AI radar:

1) If the missile is being fired in a dogfight and is not "dogfight-rated" (this is listed in the AAM Annex), then halve the missile's Air-to-Air Rating.

2) Subtract the Maneuver Rating of the defending air unit from the Maneuver Rating of the missile. This is the base Missile Index.

3) Add the modifier for the attacking aircraft's AI radar generation from the Combat System Modifier table.

4) Check the Target Size table on page 8-4 and apply the modifier to the Missile Index.

5) Check the Target Speed Modifiers table on page 8-4 and apply that modifier to the Missile index.

6) If the defending aircraft is fitted with countermeasures, compare the seeker generation of the attacking missile with the generation and type of countermeasures fitted on the Antiair Missile Countermeasures table on page 8-4. Apply the result to the Missile Index.

7) If the attacker is not at the same altitude as the target aircraft and is not using a snap up/snap down missile, apply a -1.0 modifier to the Missile Index.

8) Find the modified Missile Index on the Antiair Missile Attack Table on page 8-4. The result is the chance of a hit for a one-missile shot and a two-missile salvo.

Example: F-4E Phantom II vs. MiG-23ML Flogger G at Medium altitude, attacking with an AIM-9L: The MiG-23ML has a maneuver rating of 3.0, a Small size and Signature, a FMP speed of 590 knots at Medium Altitude, and has 2nd Gen D countermeasures.

The AIM-9L is a IRH/3rd Gen missile with an ATA Rating of 3.0, and the F-4E's APQ-120 has a 3rd Gen AI radar.

The base Missile Index is 0, for the AIM-9L's 3.0 minus the MiG's 3.0. The target Speed Modifier is 0 (590 kts), the size modifier is 0 (Small), the AI radar modifier is +1.0, and the countermeasures modifier is -0.5 (3rd Gen seeker vs. 2nd Gen D). The modified index is +0.5; the chance of a kill for a single missile is 35%, and 58% for a two-missile salvo.

Page 9-4, the AAM example in section 9.5 between the F-4E and MiG-23ML is incorrect. The manned aircraft modifier of +3.0 was eliminated. The corrected example is:

"The Missile Index is 0, for the AIM-9L's 3.0 minus the MiG's 3.0. The target Speed Modifier is 0 (590 kts), the size modifier is 0 (Small), and the countermeasures modifier is -0.5 (3rd Gen seeker vs. 2nd Gen D). The modified index is -0.5; the chance of a kill for a single missile is 25%, and 44% for a two-missile salvo."

Page 9-4, section 9.5.2 Speed Effects on AAM Range. In the last sentence, change "... increase the range by 50%." to "increase the range by 50% (x1.5)."

Page 9-5, section 9.7.3 Air Attack Procedure, change "...if an attacking aircraft is within one Tactical Turns' (3 minutes') movement" to "...if an attacking aircraft is within one Increment's movement."

Page 9-6, make these changes to the Unguided Ordnance Attack Table:

1) Delete the Evasive Target modifier
2) In its place, add:
   Land Targets: Up 2 rows
   Rudder casualty: Up 2 rows

Page 14-1, section 14.1 Applying Damage, in the fifth paragraph, change:

"Damage from fire or flooding critical hits is applied in the Plotting Phase of the third Tactical Turn after the critical hit is inflicted, with two exceptions:"

to: "Damage from fire or flooding critical hits is applied in the Resolution Phase of the third Tactical Turn after the critical hit is inflicted and after the initial damage control roll, with two exceptions:"

Page 14-5, Nuclear Weapons Effects Table, add: 45 0.67 1.00 1.62

Thanks to Margaret Lowe, Tom Niedzak, M.G. Park, and Paul Stark

The following changes are not errata. The rules for aircraft formations are being deleted.

Page 8, delete the table of contents line "9.6 Aircraft Formations," and renumber 9.6, 9.7, and 9.8 as 9.5, 9.6, and 9.7

Page 4-1, section 4.0.1 Stepped Aircraft Movement. In the fifth paragraph, delete the text "unless it is in formation or" and delete the following bullet point describing how aircraft formations turn.

Page 4-4, section 4.7.1 Aircraft Ranges. Delete the text "Flying in formation burns more fuel than normal. See the Formation Table 9.6 for the percent reduction."

Page 4-5, Section 4.7.8 Dogfight Effects on Endurance. In the second paragraph, delete "e.g., planes in formation,"

Page 9-4, Delete section 9.6 Aircraft Formations. Renumber sections 9.6, 9.7, and 9.8 as 9.5, 9.6, and 9.7.

The following changes are not errata. They were published in the April/October 2020 issue of the *Naval SITREP* (#58/59) and expand and clarify data links.

Page 7, in the table of contents, change "7.4.6 Data Links" to "7.4.6 Guidance Links."

Page 10, in the index, change "Data Links" to "Guidance Links" and move it over to the "G" section of the index.

Page 2-6, section 2.5 Plotting Orders for Unmanned Systems. Change the references to "command data links" and "data links" to "command link(s)."

Replace the current section 6.3.9 with this new section:

6.3.9 Tactical Data Links (TDLs). There are three types of TDLs.

• The first is a *time late* system, such as the NATO Link 14, that provides little more than a warning of an enemy unit in the area. A time late TDL is similar in effectiveness to a voice report, only it reaches more ships faster as the TDL transmissions are done automatically. The slow rate of data transfer doesn't improve the receiving ship's chances of detecting a contact or generating a fire control solution. The only exception is that a time late TDL warning of a submarine will allow a one-time use of the alerted operator modifier for sonar searches.

• The second type of data link is a *near-real time* system, like NATO Links 11 and 22. This kind of TDL provides a sensor cueing function; it transfers data fast enough to help the receiving platform detect a contact more quickly. The data transfer rate can also assist a platform in generating its own fire control solution (sections 6.3, 8.1.1 and 8.5.2 TDL Cue).

• The last type of TDL is a *real time* system that is often a component of dedicated targeting systems like the US CEC and AN/ARQ-59 Hawklink and the Russian Mineral, but can also be an independent system such as the NATO Link 16 system. Real time systems are very similar in function to near-real time TDLs, just faster. A real-time TDL also provides sensor cueing and can help platform in generating its own fire control solution (sections 6.3, 8.1.1 and 8.5.2 TDL Cue and 8.2 BMD Special Cases), but its main advantage over slower TDLs is real time systems can immediately convey targeting quality fire control solutions from another platform without degradation in the information.

If a platform has a targeting system with a real-time TDL, that platform can send its fire control solution to another platform with a real time or near-real time TDL as long as the links are compatible. A receiving ship/aircraft with either TDL doesn't have to generate its own fire control solution, but can attack using the transmitting unit's solution. The distinction here is that real time TDLs uses the *same* fire control solution quality as the sending platform. Ships/aircraft with a slower near-real time TDL can also use a targeting system's fire control solution for surface and antisubmarine warfare situations, but the fire control quality is *reduced* by one level due to the longer time delay.

Information passed by a platform via TDL is received by other platforms in the same Detection Phase that the contact is detected, or in the same Increment that a firm track is established.

For example, a Soviet surface action group of two Project 956 *Sovremenny* DDGs and one Project 61MP Mod Kashin DDs are preparing to launch a coordinated anti-ship missile strike on a NATO squadron. The *Sovremenny*s have successfully generated a "Good" fire control solution using their Mineral targeting complex passive channels. While the two *Sovremenny*s automatically communicate data to each other through the Mineral targeting complex's real-time TDL, they have to relay the firing data through a separate near-real-time TDL to the Mod Kashin, and this reduces the Mod Kashin's fire control solution quality to Fair.

This example deals with a situation where a fire control solution had already been generated by the two *Sovremenny* DDGs and is then passed to the Mod Kashin. In a case where two or more platforms (ships or aircraft) combined their information to form a fire control solution, then the revised TDL modifiers for sections 6.3, 8.1.1 and 8.5.2 that follows would be used.

Add this new section:

6.3.10 Sharing Contact Information Without TDLs. Contact data can be manually shared by radio (voice or teletype) or even cell phones, however, the process is slow, with a higher risk of errors, and has little tactical use other than reporting the presence of a contact in the area. If two, or more, units attempted to use passive sensor information, i.e. a cross-fix, without a TDL, the resulting fire control solution is inaccurate and has a "No Attack" quality. In this case, the only option for engaging with anti-ship missiles is to use a Bearing Only Launch and hope you get lucky.

If two or more, units attempted to use active sensor information without a TDL, the resulting fire control solution isn't much better and has a "Poor" quality. Thus a ship receiving this information has a rough idea of where the target is and would either have to close the range until it gains contact and develops its own fire control solution, or again employ a Bearing Only Launch.

TDL Modifiers in Section 6.3, 8.1.1 and 8.5.2. Information passed by near-real-time and real-time TDLs is sufficiently timely to assist in the development of a fire control solution, for anti-air, anti-surface, or even anti-submarine attacks. The modifier changes to the particular tables are:

Page 6-2, section 6.3.1, on the RF Fire Control Solution Table, Delete Sensor Type/Aircraft SS Radar +1
Add: Aircraft Sensor
Aircraft SS radar/ES: Shift one range column to the left on the active or passive table.
Other aircraft in contact and sharing data with TDL, use applicable TDL modifier.

Add: Tactical Data Link Cue
Other platforms in contact and sharing data with TDL, use applicable TDL modifier.
NRT TDL: +1
RT TDL: +2

Page 6-4, section 6.3.1 Acoustic Fire Control Solution Table:
Add: Tactical Data Link Cue
Other platforms in contact and sharing data with TDL, use applicable TDL modifier.
TL: Alerted operator only (1 time)
NRT TDL: +1
RT TDL: +2

Page 7-2, change Section 7.4.6 from "Data Links" to "Guidance Links." In the first sentence, change "...real-time data link" to "real-time guidance link."

Page 8-5, section 8.1.1 Combat System Reaction Time Table
Delete Data Link Cue: +1 to die roll

Add: Tactical Data Link Cue (see also 5.2.1, page 5-2)
"Other platforms in contact and sharing active sensor data by TDL, use applicable TDL modifier.
NRT TDL: +1
RT TDL: +2"

Page 8-18, section 8.5.2 ASW Standoff Weapons modifier list, add:
"Tactical Data Link: Other platforms in contact and sharing data by TDL, use applicable TDL modifier.
NRT TDL: +1
RT TDL: +2"

SAM & AAM Missile Attacks

Antiair Missile Attack Table

Missile Index	One Msl Pk	Two Msl Pk
-4.5	01%	02%
-4.0	02%	04%
-3.5	04%	08%
-3.0	06%	12%
-2.5	08%	15%
-2.0	10%	19%
-1.5	15%	28%
-1.0	20%	36%
-0.5	25%	44%
-0.0	30%	51%
+0.5	35%	58%
+1.0	40%	64%
+1.5	45%	70%
+2.0	50%	75%
+2.5	55%	80%
+3.0	60%	84%
+3.5	65%	88%
+4.0	70%	91%
+4.5	75%	94%
+5.0	80%	95%
+5.5	85%	95%

Target Size Modifier

Target Size	Msl ATA Mod
Large, Medium, Small	0
VSmall	-1
Stealthy	-2

Combat System Modifier

Ship CS Gen	AI Radar Gen	Missile Tgt ATA Mod	Aircraft Tgt ATA Mod
2	1-2	-1.0	0.0
3	3	0.0	1.0
4	4	0.5	2.0
5/6H	5	1.0	2.5
5/6A	6	1.5	3.0

AAMs using HOJ mode have their ATA rating halved before applying modifiers.

Target Modifiers (Modifies Missile ATA Rating)

Non-maneuvering aircraft ATA	0.0
Terminal Maneuvers	-1.0
Seaskimmer Capable?	
Full Capability (min altitude VLow)	0
Partial Capability (min altitude PVLow)	-2
Not Capable (min altitude Low)	-4

Target Speed Modifiers

(kts)	Mach	Descriptor	ATA Mod
≤250	0.4	Slow	+2
251-500	0.8	Subsonic	+1
501-750	0.9-1.2	Transonic	0
751-1525	1.3-2.5	Low Supers.	-1
1526-2300	2.6-3.8	Med Supers.	-2
2301-3075	3.9-5.0	High Supers.	-3
3076-4100	5.1-6.7	Low Hypers.	-4
4101-5125	6.7-8.3	Med Hypers.	-5
5126+	8.4+	High Hypers.	-6

Bearing Rate Modifier

Description	Tac Turn Bearing Shift	Msl ATA Mod
Closing	0 - 20°	0
Divergent	21 - 45°	-2.0
Crossing	45+°	-4.0
High Diving*		-2.0

*Short Range and Point Defense engagements for 1st - 3rd Gen Combat Systems only.

Range Band Modifiers

Range Band	Range (nmi)	Msl ATA Mod
Point Defense	≤4.0	0
Short	4.1 - 15.0	0
Medium 1	15.1 - 30.0	0
Medium 2	30.1 - 45.0	-0.5
Long 1	45.1 - 60.0	-0.5
Long 2	60.1 - 90.0	-1.0
Very Long	90.1 - 135.0	-1.5
Extreme	135.1+	-2.0

- SAMs with a minimum range greater than 2.5 nmi cannot fire into the Point Defense Range Band
- If there is more than one engagement within the Long or Medium range bands, the first one uses the outer band, the rest use the inner band.

Antiair Missile Countermeasures Table

Msl Seeker Gen	1st Gen Jam	2nd Gen Jam	3rd Gen Jam	4th Gen Jam	1st Gen Decoy	2nd Gen Decoy	3rd Gen Decoy	4th Gen Decoy	1st Gen J&D	2nd Gen J&D	3rd Gen J&D	4th Gen J&D
1	-1.5	-2.0	-2.5	-3.5	-1.0	-1.5	-2.0	-3.0	-2.5	-3.5	-4.5	-5.5
2	-1.0	-1.5	-2.0	-3.0	-0.5	-1.0	-1.5	-2.5	-2.0	-3.0	-3.5	-5.0
3	-0.5	-1.0	-1.5	-2.5	-0.5	-0.5	-1.0	-2.0	-1.0	-2.0	-3.0	-4.5
4	--	-0.5	-1.0	-2.0	--	-0.5	-0.5	-1.5	-0.5	-1.0	-2.0	-3.5
5	--	--	-0.5	-1.5	--	--	-0.5	-1.0	--	-0.5	-1.0	-2.5

Note: If the defending aircraft cannot or chooses not to maneuver, then halve the countermeasure modifier before applying it to the Missile Index. Its Maneuver Rating is also reduced to 0.0.