

Modern General Quarters

Tactical Turns:

1 Tactical Turn is 5 minutes.

5cm equals 1 nautical mile

To calculate speed in centimetres, divide maximum speed by 2.4. For example, a 30 knot ship moves 30/2.4cm or 12.5cm. Round up to 13cm.

Turning up to 45° uses 1cm of movement. CVNs and merchant ships can only make 2 turns in a tactical Turn (up to 90° in total).

Defence Value = $K * (1 + ((\text{Length} - 300) / 100))$ $K * (1 + ((\text{Length} - 91.5) / 30.5))$ in metres (thanks to Steve)

K= 1.55 (1.4 for poorly built, poorly maintained or old ships, 1.6-1.7 for well built ships with decent vulnerability features)

Order of Play

Move detected submarines

Move surface ships

Move undetected submarines

Move aircraft

Submarines may fire at contacts made last turn

Check for radar, visual and sonar detection

Ships with ASW helicopters on deck CAP may launch at detected submarines

Fire weapons

Resolve attacks.

Gunnery

Similar to GQ. Add the number of functional mounts to get the Firepower factor. Roll a d10 on the gunnery table to hit, rolling a red and white die at the same time. If a hit is scored use the red and white dice to determine hull boxes lost and system hits inflicted.

Air Operations

Unless specified aircraft move at the following rates:

Type	Speed (cm)	Maximum Height	Turn Distance (cm)	Level 0 Accident Roll (%)
Helicopters	40	2	0	0
LRMP	100	3	25	3%
Strike aircraft, subsonic fighters	200	3	15	2%
Supersonic fighters	400	3	25	3%

Aircraft may make turns of up to 45°. Each turn must be separated by the Turn Distance shown above. Supersonic aircraft moving at subsonic speeds turn as if subsonic aircraft. The data above is for generic aircraft types. Players may substitute the above for type-specific data if required.

Aircraft may change altitude by 2 levels per turn at a penalty of 25% of their movement per level climbed or dived.

Launching or recovering to a ship takes 1 turn where the aircraft is placed at the stern (if recovering or a helicopter launching from a ship with an aft flight deck) or at the bow (if launching from a CV). Aircraft carriers must be steaming into the wind to launch or recover aircraft (with the wind within 45° of the bow). Carriers operating VSTOL aircraft have no wind restriction, but weapon/fuel loads are likely to be reduced if launching into the wind is not undertaken.

Aircraft can fly at heights from Very Low through Low, Medium, High and Very High. Very Low is sea skimming or hovering. Weapon systems will have maximum engagement heights, so a fighter at High cannot be hit by a Small Calibre Gun which has a maximum height of Medium. Aircraft flying at Very Low may crash by accident - roll % dice for the scores in the table above per turn per plane for the aircraft to crash.

When shooting at aircraft, total the AD or PD ratings of all systems in range and roll to see how many aircraft are shot down. Disbursed aircraft must head for home. Two disbursements shoots down an aircraft.

To bomb a target the aircraft must move into contact with the target. If using missiles it must move to the release point. Movement stops at the point of release. Aircraft with guns only, flying at Very Low or Low can perform strafing attacks. Move the aircraft into contact with the ship and roll a d10. On a roll of 1 a critical hit has been scored if the target was a Medium sized ship. If the target was Small ship a critical is scored on a 1-2, and on a Large ship on a 1 followed by a further roll of 1-4. Otherwise there are no effects.

Air Operations in Restricted Waters

No air defence (AD) rolls are allowed unless using FAMS in conjunction with AEW aircraft. Ships use PD ratings only, but may use a weapon's AD rating if this is higher, and may use AD weapons which would not normally be used in the PD roll, but all PD restrictions apply.

Air to Air Combat

Air to Air combat is resolved in a semi-abstract manner. Each aircraft has Air to Air Combat Ratings (ACRs). Some aircraft have one rating, denoting Local capability only (guns, short ranged missiles), whilst others have 2 values for Area and Local capabilities. Finally, a few aircraft have three ratings, denoting Long Range capabilities also (these are aircraft such as the F-14 armed with very long ranged missiles such as Phoenix). Each aircraft is allowed 2 attacks with each rating shown, after which it resorts to a Local rating of 1, denoting guns only. Thus the various ratings reflect the number of missiles carried as well as the capabilities of the missiles themselves.

Local range is 20cm, and involves dogfighting .

Area Range is from 20cm to 75cm.

Long Range is from 75cm to 300cm.

Players move their aircraft after surface ships. Attacking aircraft are moved first; CAP aircraft are moved afterwards in reaction to the enemy's movement. Combat occurs at Long Range, then Area, then Close. As an example, a strike is closing with a US task group. A CAP of 2 F-14 Tomcats is overhead. The raid is made up of subsonic fighter bombers. The raid starts at 400cm and closes to 200cm at the end of the first turn of the raid. The Tomcats loiter over the Task Group. As the raid is within 300cm the Tomcats can use their Long Range ACR ratings against the raid. They may make 1 or 2 attacks as desired. On the second turn the raid closes with the task group and ends the turn in contact. The Tomcats accelerate and contact the raid 100cm from the Task Group. The Tomcats only used one of their Long range ACR attacks and can thus make another (the raid started the turn at Long Range). As the raid and the Tomcats move into contact they pass through Area range, so both may use their Area ACR ratings. They end in contact so both may use their Local ACR ratings. The Tomcats hold off 100cm from the Task Group - the surviving raiders now face the AA fire of the ships.

Strike aircraft which are loaded may not engage in dogfighting, i.e. they may not use their Local ACR Ratings, unless they jettison their bombs. Defending fighters which encounter a mixed force of strike fighters and escorts must engage the escort first.

Aircraft also have a Defence Rating. This is a modifier applied to the die roll on the Air Defence Table. Rolls in excess of 6 cause no losses.

ECM aircraft may accompany raids. They afford a Defence Rating of +1 or +2 to all attacks by Long or Area weapons on friendly aircraft within 15cm. Note this also applies to missile attacks by Area Air Defence weapons on ships.

To resolve the effects of AA fire, total the ratings of the aircraft involved and roll on the Air Defence Table as for Surface to Air fire.

Typical ratings:

ACR Ratings

Local 1 if gun armed
 1 per dogfighting missile (AIM-9E)
 1.5 per all aspect dogfighting missile

Area 1 per normal BVR Guided missile
 1.5 per 'modern' missile (AIM-120)

Long 2 per Long Range Missile

Defence Ratings

LRMP, Transports, bombers	-1,2	e.g. Canberra, Neptune, Orion
Normal fighters, fighter/bombers	0	e.g. Mig 21, Mirage, Phantom
High Manoeuvrability Fighters	+1,2	e.g. F-16, Sea Harrier

Anti Ship Missiles

These are treated as pilotless aircraft and are assumed to reach their target on the turn of firing (for simplicity). The number of missiles fired at a task group is announced. If the missiles are detected the group's AD weapons can engage. Following the AD phase the missiles are allocated to targets. If the targets were detected using active radar the targets may be specified, else roll a d6 per missile:

- 1 Firer's choice
- 2-3 Largest ship
- 4 Closest escort to firer
- 5-6 Determine randomly from escorts

PD systems now engage missiles targeted at their ship. Missiles penetrating the AD and PD screen roll to see if they hit the target, and damage is decided.

Missiles fired from a single ship or a group of ships linked by data link are treated as a single salvo, and their effects are resolved together. If missiles are fired at a target (single ship or group of ships) from separate groups, or from ships not linked in, the fire from each group or ship are treated as separate salvos. Roll d10 to determine the order in which they arrive. If two or more salvos roll the same number, they arrive simultaneously and are treated as a single salvo.

Anti ship missiles may also be engaged by CAP aircraft armed with Long Range missiles. Area or Local attacks may not be made on anti ship missiles unless specified (the referee may allow attacks to be made on very large, slow flying missiles).

Submarines and Torpedoes

Submarines are best handled using map movement, or if they are controlled by the referee. Subs move as normal ships, but are not placed on the table unless on the surface or if they have been detected.

Torpedo Attacks

Type	Range	Roll to hit	Notes
Unguided (e.g. Mk8)	25cm	1-2 (over 15cm) 1-4 (under 15cm)	Not against submerged submarines
Guided (e.g. Mk48, Spearfish)	60cm	1-8	
Wake Homing	200cm	1-8	Not against submerged submarines

ASW Attacks

Weapon	Range
ASW Mortar	5cm
ASW TT (e.g. Stingray)	15cm
ASW Missile (e.g. ASROC)	45cm
Helicopter Torpedo	15cm from helo

All ASW attacks hit the submarine on a roll of 1-6. If the sub is hit, roll for damage.

Score	Effect
1-8	Submarine destroyed
9	Submarine damaged and must surface, all weapons KO
10	Submarine damaged but may remain submerged, all weapons KO
11+	No damage

Add 2 if the target is a multi-hulled submarine, e.g. Typhoon or Oscar
Subtract 1 if the target is a Coastal submarine, e.g. Type 209

Torpedoes hitting surface ships have an AF of 30 for heavyweight torpedoes, 10 for lightweight. Heavyweight torpedoes cause 1 additional hull hit regardless of the damage rolled.

Target Detection

Radar

The following table gives maximum detection ranges in cm between ships of different sizes, and aircraft.

Radar Horizon Ranges - Theoretical Maximum Ranges

Ranges in Nautical Miles and (hexes), assuming 30nm hexes.

	Spotter								
	Aircraft at Altitude Level					Surface Ship			
	VHigh	High	Medium	Low	VLow	Large	Medium	Small	VSmall
VHigh	700 (23)	580 (19)	445 (15)	390 (13)	360 (12)	360 (12)	360 (12)	360 (12)	350 (12)
High	580 (19)	460 (15)	325 (11)	240 (8)	220 (7)	260 (9)	240 (8)	240 (8)	230 (8)
Medium	445 (15)	325 (11)	190 (6)	135 (4)	110 (4)	110 (4)	110 (4)	105 (4)	95 (3)
Low	390 (13)	240 (8)	135 (4)	80 (3)	50 (2)	50 (2)	50 (2)	50 (2)	40 (1)
VLow	360 (12)	220 (7)	110 (4)	50 (2)	25 (1)	25 (1)	25 (1)	20 (1)	15 (S)
Large	360 (12)	260 (9)	110 (4)	50 (2)	25 (1)	30 (1)	25 (1)	25 (1)	15 (1)
Medium	360 (12)	240 (8)	110 (4)	50 (2)	25 (1)	25 (1)	25 (1)	20 (1)	15 (S)
Small	360 (12)	240 (8)	105 (4)	50 (2)	20 (1)	25 (1)	20 (1)	20 (1)	10 (S)
VSmall	350 (12)	230 (8)	95 (3)	40 (1)	15 (S)	15 (1)	15 (S)	10 (S)	1 (S)

Passive detection ranges are multiplied by 1.5. For example, a Large CG using radar can detect a Very Small Fast Attack Craft at 15nm (75cm). However, the FAC can detect the CG's radar emissions at 90cm (active range, FAC to CG 60cm), giving the FAC a chance to fire or evade. Missiles can be fired on Passive contacts, but are BOL (Bearing Only Launch) and targets are selected at random.

Radar detection is automatic at the ranges above. If jammers are used (optional rule) the jamming ship is treated as having its radar on, but all detection attempts need to roll 1-4 for success.

Passive detection allows SSMs to be fired in BOL mode. Guns and anti aircraft systems cannot be fired using passive contacts.

NB: Ships and aircraft may have maximum detection ranges specified which fall short of the distances quoted above.

Pop-Up Radar Detection

A common tactic is to fly low, occasionally popping up above the radar horizon to search for targets. Aircraft doing this fly at level 1, but may pop up to level 2 and use that range's detection ranges. A roll of 1-7 is required to detect targets in range. Air defence units which could detect the aircraft at level 2, but not at level 1 may try to engage, rolling 1-2 plus the ship's Ops rating to be successful and allow an attack to be made. Missiles fired by aircraft making pop-up attacks are resolved as BOL launches.

Visual Horizon Ranges - Theoretical Maximum Ranges

The following table gives maximum visual detection ranges between ships of different sizes, and aircraft. Visual detection is automatic. Ranges in Nautical Miles and (hexes), assuming 30nm hexes.

	Spotter								
	Aircraft at Altitude Level					Surface Ship			
	VHigh	High	Medium	Low	VLow	Large	Medium	Small	VSmall
VHigh	50 (2)	50 (2)	50 (2)	50 (2)	50 (2)	50 (2)	50 (2)	50 (2)	50 (2)
High	50 (2)	50 (2)	50 (2)	50 (2)	50 (2)	50 (2)	50 (2)	50 (2)	50 (2)
Medium	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)
Low	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)
VLow	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)
Large	30 (1)	30 (1)	30 (1)	30 (1)	17 (1)	19 (1)	17 (1)	15 (S)	11 (S)
Medium	30 (1)	30 (1)	30 (1)	20 (1)	15 (S)	17 (1)	14 (S)	12 (S)	6 (S)
Small	30 (1)	20 (1)	20 (1)	17 (1)	14 (S)	15 (S)	12 (S)	10 (S)	5 (S)
VSmall	20 (1)	20 (1)	20 (1)	15 (S)	10 (S)	11 (S)	6 (S)	5 (S)	1 (S)

Visual detection ranges assume good visibility. The referee may impose a maximum spotting range, or a combination of a maximum range with a range multiplier. For example, in rain, all spotting ranges may be halved, with a maximum spotting range of 6 miles (30cm). Thus, a FAC would be spotted out to 20cm, a destroyer out to 22.5cm, but carriers and merchants only to 30cm.

Missile Detection

If a task group comes under missile attack, roll a d6 and add the highest Ops rating in the group. If the roll is 3 or more adequate warning has been given and AD attacks on the missiles may be made, otherwise response is limited to PD rated weapons on the target ships. In this case PD response may also only be carried out by ships attempting and succeeding in a similar roll to detect the missile - d6 plus the ops rating, looking for a result of 3+.

A group AD roll assumes the presence of a data link - if ships are not Linked, roll a d6 per ship, add the Ops rating of the ship, and allow AD action by those ships which roll 3 or more.

Sonar Detection

Surface ships and submarines may be detected using sonar.

Range	Direct Path					Convergence Zone	
	0-10	10-20	20-30	30-40	40-50	125-175	250-350
Active	1-9	1-7	1-6	1-3	1	-	-
Passive	1-9	1-7	1-6	1-4	1-4	1-4	1-4

Modifiers:

Passive

- +? Sonar rating
- ? Submarine noise rating
- +2 Submarine at 15 knots +
- 2 Searcher at 15 knots +
- +2 Target released a weapon

Active

- +? Sonar rating

Notes:

1. Convergence Zone sonar contacts are only available in Deep water to sonars with ratings of +1 or more.
2. Ships and submarines not streaming Towed Arrays have a blind spot extending 30° each side of the ship's centreline aft.
3. Submarines may be below a Thermal Layer (the referee will decide if a layer is present). The effect of a layer is to reduce the maximum detection range by direct path to 30cm. Convergence Zone detection is unaffected.

Submerged submarines detect ships using the same method. A passive contact is sufficient to allow SSMs to be fired using BOL, or wake homing torpedoes, or active torpedoes.

Contact is maintained until :

1. A target moves out of range
2. There is an underwater explosion , e.g. a torpedo hits, a depth charge is fired etc.

Ship Data

Gunnery Factors

1	Single or twin 76mm manual
2	5" manual, single 76mm auto, 4.5" Mk5
3	4.5" Mk6, Soviety 100mm auto
4	4.5" Mk8, 5" auto, single 130mm auto
5	8" auto, 130mm twin auto, 6-8" multiple mount manual
6	larger guns

Factors are per mount. A Sovremenny with 2 130mm mounts has a gunfire factor of 10. Ships with multiple sizes e.g. Italian destroyers with 5"/54 and 76mm treat as main and secondary.

Typical Air Defence Factors

PD: Point Defence, AD: Area Defence

	PD	AD	Range
20mm, 40mm	1*	-	
Gatling or Fast '40	4	-	
76mm	2	-	
4.5"/5"/130mm	3	-	
PDMS (e.g. Seawolf)	4	-	
ADMS (e.g. Seadart)	1	4	

*only used if ship has no other PD rated weapons.

The ratings quoted above are typical and may vary depending on weapon types. Note that ships with effective command systems can add up to 2 to their AD rating (signified by a number in the Ops box)

Ship systems (weapons, different sensor classes and CIC) are grouped into Systems. Different size class ships have a different number of systems.

FAC, Patrol Craft	6
Frigates, Destroyers	10
Cruisers	12
Carriers	20

For example, a Type 23 has the following systems:

1. 4.5" Gun
2. VL Seawolf
3. MTLs
4. Sonar
5. Radar
6. Ops Room
7. Helicopter
8. Harpoon
9. Small Calibre Gun
10. Blank

If the red die calls for 3 System hits, 3d10 are rolled. If the score is 1, 4, 6 this would mean the 4.5" gun, the Sonar and the Ops Room had been hit. If a ship does not have enough systems to fill the required number of system boxes the rest are treated as blanks, and no system is lost if that number is rolled.

If a ship has excess systems they should be grouped geographically. The Russian Sovremenny is an example:

1. 130mm auto
2. SA-N-7
3. Radar, RBU
4. Sonar, CIWS
5. Ops
6. SS-N-22
7. 533mm TT, CIWS
8. SA-N-7
9. 130mm Auto
10. Helicopter

In this example the Sonar and CIWS are grouped together; a roll of 4 would wipe out both systems

Systems

If a system is lost it is destroyed. The various capabilities of systems are listed below.

Ops

This represents the operations room and the combat system of the ship. Loss of the Ops room sends all guns to local control and Data Link is lost. A number following Ops in the AD or PD columns means the command system increases the effectiveness of the ships air defence system, and that number is added to the ship's PD and/or AD rating.

Radar

This covers all on board radar systems. radar effectiveness is largely factored into the tables already, but particularly good radars add 10% to the stated ranges, whilst poor radars lose 10%.

Sonar

This covers all on board sonar equipment. A number following the word 'sonar' denotes a particularly effective system which can use Convergence Zone targeting. The number is a modifier to sonar detection rolls.

Noise

Unless stated all ships and submarines have a noise rating of 0. The noise rating is a modifier to enemy passive sonar detection attempts. For example, a quiet submarine may have a noise rating of -2, a noisy transport ship may have a rating of +2 etc.

Expendables

This represents ammunition for particular systems - SSMs and torpedoes. Other systems are assumed to have sufficient ammunition for the whole game (although in a campaign each system - guns, CIWS, AD/PD etc. may be limited to 20 rounds of use before resupply is needed). As missiles are fired or torpedoes launched, the relevant boxes are crossed off.

Strategic Rules

1 hex equals 30 nautical miles

1 turn equals two hours

Serial	Activity	Sub 1	Sub2
1	Communications	Check for interception	
2	Plot Movement	Surface Submarine Air Search Speculative Strike LRMP	Arrange pickets up to 2 hexes away Check speed for detection. inc. CAP and ASW Helo ASW, Shadows
3	Check contacts	Visual Radar Sonar	Same hex
4	Launch air strikes	Including helo deck CAP vs subs	
5	Contact	Missile fire Air strikes Torpedoes/ASW Task Groups in adjacent hexes Damage Resolution	CAP vs attackers Deck CAP launches OK? Strike vs AAGW Strike vs ships Tabletop action, or resolve using abstract system Tabletop action.
6	Shadowing	Air Surface	air following returning strikes air following ships, subs ships following TFs TA ships following contacts
		General	Check to see if target detects shadows Check to see if target takes out shadows
7	Return air phase	Aircraft to re-arm boxes	

S1. COMMUNICATIONS.

Players pass messages between commands at this stage. If they send a message roll 1-4 for the transmission to be detected, 1-6 if detecting units have specialist, well developed ESM systems.

S2. PLOT MOVEMENT.

2.1/2.2 Surface Ships and Submarines

Speed (knots)	Data Sheet Speed	Type	Movement
8	3	SSK, Merchants	1 hex per 2 turns
15	6	Merchants, RFA	1 hex per turn
23	9	RFA, slow warships	1 hex on odd turns, 2 hexes on even turns
30	13	Warships, SSN	2 hexes per turn
38	16	FAC, SSN	2 hexes on odd turns, 3 hexes on even turns
45	18	Russian SSN	3 hexes per turn

SSNs are likely to suffer detection penalties if travelling at more than 1 hex per turn..

2.3(a) Air Search

Specify a search hex for each search aircraft sent out. Specify which level the aircraft will fly at, and whether radar is to be on whilst in transit.

2.3(b) CAP

Specify which aircraft are on CAP. CAP may be airborne or Deck CAP, launching only when targets are detected, but reacting slower. CAP may be BARCAP (anti aircraft), SUBCAP (ASW), or SURCAP (anti surface). Specify which type of CAP and whether they are Deck or airborne. If airborne specify a hex in which the aircraft are flying, up to 3 hexes away from the parent base/carrier, or up to 1 hex if helicopters. Specify whether radar is to be used.

2.4 Speculative Strike (inc. Strikes at Land Bases)

Specify the aircraft taking part and their target hexes. Strikes fly at Level 2 unless stated otherwise. Specify whether the strike is to engage targets of opportunity. Specify whether the strike will use radar during the mission.

2.5 LRMP

LRMP aircraft may be in 1 of 2 modes; Surface Search or ASW. In either case they are assigned a target hex, and are assumed to be orbiting within an area of radius 2 hexes. If in Surface Search add 2 hexes to their detection range. If in ASW mode they are at level 1. Roll a d10 to detect any submarines in the area, requiring 1-2 for success, 1-3 for advanced systems such as those on the Nimrod or P-3.

LRMP may travel on passage at level 2+ up to 20 hexes, or at Level 1 for 15 hexes. They may use MAD to detect subs if at Level 1, requiring a roll of 1 to succeed.

S3. DETECTION.

Radar

The following table gives maximum detection ranges in hexes between ships of different sizes, and aircraft. Detection is automatic provided the ship's radar systems are operational and switched on. (Optional: 'Leakers (single aircraft) at level 1 get through on 8+)

Radar Horizon Ranges - Theoretical Maximum Ranges

Ranges in Nautical Miles and (hexes), assuming 30nm hexes.

	Spotter								
	Aircraft at Altitude Level					Surface Ship			
	VHigh	High	Medium	Low	VLow	Large	Medium	Small	VSmall
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High	580 (19)	460 (15)	325 (11)	240 (8)	220 (7)	260 (9)	240 (8)	240 (8)	230 (8)
Medium	445 (15)	325 (11)	190 (6)	135 (4)	110 (4)	110 (4)	110 (4)	105 (4)	95 (3)
Low	390 (13)	240 (8)	135 (4)	80 (3)	50 (2)	50 (2)	50 (2)	50 (2)	40 (1)
VLow	360 (12)	220 (7)	110 (4)	50 (2)	25 (1)	25 (1)	25 (1)	20 (1)	15 (S)
Large	360 (12)	260 (9)	110 (4)	50 (2)	25 (1)	30 (1)	25 (1)	25 (1)	15 (1)
Medium	360 (12)	240 (8)	110 (4)	50 (2)	25 (1)	25 (1)	25 (1)	20 (1)	15 (S)
Small	360 (12)	240 (8)	105 (4)	50 (2)	20 (1)	25 (1)	20 (1)	20 (1)	10 (S)
VSmall	350 (12)	230 (8)	95 (3)	40 (1)	15 (S)	15 (1)	15 (S)	10 (S)	1 (S)

Passive detection ranges are multiplied by 1.5, rounded up. For example, a Small frigate using radar can detect a Very Small FAC at 10 miles, in the same hex. However, the FAC can detect the frigate's emissions up to 15 miles away, possibly in an adjacent hex, giving the FAC a chance to fire or evade. Missiles can be fired on Passive contacts, but are BOL (Bearing Only Launch) and targets are selected at random.

Ranges above assume high spec military radars (except in the case of merchants where an 8nm range marine set is assumed). Some systems may have limited capabilities, in which case their maximum range will be noted.

Radar detection is automatic at the ranges above. If jammers are used (optional rule) the jamming ship is treated as having its radar on, but all detection attempts need to roll 1-4 for success.

Passive detection allows SSMs to be fired in BOL mode. Guns and anti aircraft systems cannot be fired using passive contacts.

Visual Detection

The following table gives maximum visual detection ranges between ships of different sizes, and aircraft. Visual detection is automatic, except for detection of FACs and aircraft at level 1 where a roll of 1-7 is required.. Visual detection ranges assume good visibility. The referee may impose a maximum spotting range, or a combination of a maximum range with a range multiplier. For example, in rain, spotting may be disallowed in adjacent hexes

Visual Horizon Ranges - Theoretical Maximum Ranges

Ranges in Nautical Miles and (hexes), assuming 30nm hexes.

	Spotter								
	Aircraft at Altitude Level					Surface Ship			
	VHigh	High	Medium	Low	VLow	Large	Medium	Small	VSmall
VHigh	50 (2)	50 (2)	50 (2)	50 (2)	50 (2)	50 (2)	50 (2)	50 (2)	50 (2)
High	50 (2)	50 (2)	50 (2)	50 (2)	50 (2)	50 (2)	50 (2)	50 (2)	50 (2)
Medium	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)
Low	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)
VLow	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)	6 (S)
Large	30 (1)	30 (1)	30 (1)	30 (1)	17 (1)	19 (1)	17 (1)	15 (S)	11 (S)

Medium	30 (1)	30 (1)	30 (1)	20 (1)	15 (S)	17 (1)	14 (S)	12 (S)	6 (S)
Small	30 (1)	20 (1)	20 (1)	17 (1)	14 (S)	15 (S)	12 (S)	10 (S)	5 (S)
VSmall	20 (1)	20 (1)	20 (1)	15 (S)	10 (S)	11 (S)	6 (S)	5 (S)	1 (S)

Missile Detection

If a task group comes under missile attack, roll a d6 and add the highest Ops rating in the group. If the roll is 3 or more adequate warning has been given and AD attacks on the missiles may be made, otherwise response is limited to PD rated weapons on the target ships. This assumes the presence of a data link - if ships are not Linked, roll a d6 per ship, add the Ops rating of the ship, and allow AD action by those ships which roll 4 or more.

Sonar Detection

	Direct Path	Convergence Zone	
Range	Same	2 only	4 only
Active	1-5	-	-
Passive	1-5	1-4	1-4

Die Roll Modifiers:

Passive

- +/-? Sonar rating
- +/-? Submarine noise rating
- 2 Submarine at 2 hex speed
- +2 Searcher at 2 hex speed
- 2 Target released a weapon last turn
- +2 Target in Shallow water

Active

- +/-? Sonar rating
- +2 Target in Shallow water

Notes:

1. Convergence Zone sonar contacts are only available in Deep water to sonars with ratings of +1 or more.

Submarines may be below a Thermal Layer (the referee will decide if a layer is present). The effect of a layer is to reduce the maximum detection range by direct path to 30cm. Convergence Zone detection is unaffected.

Submerged submarines detect ships using the same method. A passive contact is sufficient to allow SSMs to be fired using BOL, or wake homing torpedoes, or active torpedoes.

NB Ships or submarines with CZ contacts on targets may attempt to shadow their target's movement. To succeed they must make a successful detection roll at +2. If so they are moved by the referee to a point where they may maintain contact. If they lose contact they are informed of the general direction in which the target was moving when contact was lost, but they remain in the hex they started in, or move 1 hex in the direction following the target (referee rolls a d6; 1-2, 1 hex side left, 3,4 accurate heading, 5,6 1 hexside right).

S4. LAUNCH AIR STRIKES (AIR OPERATIONS)

If new targets have been detected and aircraft are available, air strikes may be launched. Specify the number of aircraft involved, the target hex, level to fly at (2 assumed), whether radar is to be used etc. Check passage to see if the strike encounters any enemy CAP. If so, go to S5.2

Refuelling

If IFR is available, strike aircraft may double their combat range. If so, they must assign a hex as their IFR base hex, in which the tankers are based. If the IFR hex is within enemy CAP range (6 hexes +/- CAP rating) IFR is cancelled (the tankers are too valuable to lose) and the mission is scrubbed. If players are desperate to mount the mission they may countermand this and go ahead. CAP will automatically be able to attack the CAP hex (friendly fighters may be allocated to the CAP hex to defend it).

S5.1 MISSILE FIRE

Missile fire is treated as a one way air strike. Once a target has been detected the firing player allocates missiles to the strike. If the target has been detected by active radar the firer can specify which missiles are fired at which target. The attack is fought out using the tactical rules.

1. Roll for Area defence missile fire: Add the AD ratings of all ships in the target group.
2. Lay out the ships of the target group in their steaming formation. Allocate missiles to targets and note the flight paths of the missiles.
3. Point defence systems now engage the missiles. Point defence systems other than CIWS can only engage missiles which are aimed at the ship on which the system is mounted, or if the missile flight path passes within 4" of the ship. CIWS can only engage missiles aimed at the carrying ship, or which pass over the carrying ship.
4. If a point defence system could engage a missile aimed at the ship it is carried on or a second ship, it will always engage the missile targetting its own ship.
5. Once anti missile fire has been completed, roll to see if the surviving missiles hit their targets.

S5.2 AIR STRIKES

1. Strike launches long range missiles (see S5.1), CAP intercepts if able
2. Resolve CAP vs strike
3. Strike launches medium range missiles (see S5.1)
4. Resolve area air defence against strike
5. Strike launches short range missiles (see S5.1)
6. Resolve point defence against strike
7. Strike launches very short range missiles, rockets, strafes, bombs etc.

CAP

CAP forces attack any enemy aircraft passing through their hex, To intercept aircraft further out, roll a d6 and exceed the range, counting the CAP hex AND the target hex, so a plane in an adjacent hex is intercepted on 2+, one at 5 hexes on 6+. Add the aircraft's CAP modifier (e.g. 0 for Sea Harrier, 3 for Tomcat etc.)

NB: CAP is also effective against opposing CAP, enemy air search units, LRMP etc.

S5.3 TORPEDO/ASW PHASE

If submarines and surface ships in same hex, or sub in same hex as ASW aircraft or helo.

Torpedo/ASW Resolution Chart		
1	Submarine detected? (already decided)	y: goto 5 n: goto 2
2.	Submarine decides to attack	y: goto 3 n: goto 6
3.	Submarine selectes targets and fires	see torpedo attacks in tactical rules : goto 4
4.	New detection phase - submarine detected after firing?	y: goto 5 n: goto 2
5.	ASW Attack Phase - determine most effective weapon, and roll to hit (+2 to die for double skinned subs, -1 for Coastal subs, -1 if more than one wepaon system of that type employed). KO as in tactical rules. ASW Helo 1-6 ASW Helo on Deck CAP 1-4 ASW Missile 1-6 STWS 1-2 Submarine torpedo 1-8 Mortar/rocket 1 Submarine KO'd ?	y: end combat phase n: goto 2
6	Send Contact Report?	y: Roll for detection of transmission n: disengage, or rejoin for attack, goto 3.

In the case of 2 submarines in the same hex, if neiher detects the other there is no combat

If both detect each other, attacks are simultaneous.

If one detects the other, but the other fails the detecting sub goes through the above table.

For submarines tryiong to attack large task forces with ASW screens, this system needs to be run through twice; once against the outer screen and once against the main body.

As an alterative, the whole process can be resolved as a tabletop action rather than using the abstract system.

S6. SHADOWING

Determine whether shadowing units will be assigned to enemy units.

S7. RETURN AIR PHASE

Once an air mission is resolved move the aircraft to the Rearm 2 box on their carrier/base display. Next move, place them in the Rearm 1 box. The following turn move them to the Ready box. Helicopters and aircraft on CAP go straight from missions to the Rearm 1 box.

S8 MISCELLANEOUS

RAS

May be required in a scenario. Takes 1 campaign turn per 4 ships per RFA, so 6 ships and 1 RFA takes 2 turns, 8 ships and 2 RFAs takes 1 turn.

Modern Gunnery Table									
A U T O		76mm 3"	105mm 4.5"	130mm 5"	150mm 6"	203mm 8"	400mm 16"		L O C A L
	1-4	40	55	70	60	70	105	1-2	
	1-5	36	50	67	54	67	95	1-3	
	1-6	32	45	62	48	62	85	1-4	
	1-7	28	40	56	42	56	74	1-5	
	1-8	8	15	18	12	18	20	1-7	
1-9	4	10	10	6	10	10	1-8		

Gunnery Modifiers

CG target -1
CV, merchant target -2

Laser Designators:

Measure range from designator to target
maximum range of weapon remains the same.

Gunnery Damage Table - Hull											
Die Roll		1/3	1/2	2/3	1/1	3/2	2/1	3/1	4/1	5/1	6/1
	1	½	1	1	1	1½	2	2	3	4	5
	2	C	½	½	1	1½	2	2	3	3	4
	3	-	C	½C	1C	1C	1C	2C	2C	3C	3C
	4	-	-	-	½	1	1	1	1.5	2	2
	5	-	-	-	-	-	½	1	1	1	1
	6	-	-	-	-	-	-	½	1	1	1

Result is the number of Hull boxes lost.

Gunnery Damage Table - Systems											
Die Roll		1/3	1/2	2/3	1/1	3/2	2/1	3/1	4/1	5/1	6/1
	1	1	1	2	2	2	3	4	5	6	7
	2	-	1	1	2	2	2	3	4	5	6
	3	-	-	-	1	1	2	2	3	4	5
	4	-	-	-	-	1	1	2	2	3	4
	5	-	-	-	-	-	1	1	1	2	3
	6	-	-	-	-	-	-	1	1	1	2

Result is the number of System die rolls to be made.

Critical Hits - roll a d10

1	EDC Hit - all systems inoperative next turn
2,3	Ops room shaken - treat as if ops room were destroyed. Roll 1-4 per turn to restore ops capability
4	Gearbox failure. Multi shafted ships have speed reduced to that in next hull box. Single screwed ships (or multi screwed with a gearbox hit already) stop.
5	Rudder damaged - 2cm of movement are used for each 45° turn
6,7	Fire - lose 1/2 hull box per turn and roll for one system hit per turn. Roll 1-4 to bring under control.
8	Flooding - lose one extra hull box due to extensive flooding
9	System damage - roll for 3 extra system hits.
10	Magazine hit and explodes - determine which weapon system explodes - lose 2 hull boxes.

Air Defence Table											
	1	2	3	4	5	6	7-8	9-10	11-12	13-14	15-18
1	-/1	-/1	1/1	1/2	1/2	2/2	2/2	2/2	3/2	3/3	4/3
2	1/-	-/1	-/1	-/1	1/1	1/2	1/2	1/2	2/2	2/3	3/3
3	-	1/-	1/-	1/-	1/1	1/1	1/1	2/1	2/1	2/2	2/3
4	-	-	-/1	-/1	-/1	-/1	1/1	1/1	1/2	1/2	2/2
5	-	-	-	1/-	1/-	1/-	1/-	1/-	1/-	2/1	2/1
6	-	-	-	-	-	-	-	-	-	1/-	1/-

Area Defence is used against all air targets attacking the task group as a first attack. Point Defence is used against air targets attacking the target ship only, or passing within weapons range and with clear lines of sight.

Double AD/PD ratings against missiles at Medium or higher, except 'High Divers', and against Large aircraft.

Reduce AD/PD ratings against targets at Vlow, including Sea Skimming missiles, to 1 unless the weapon is marked *

Halve AD ratings, and PD ratings of CIWS against supersonic missiles

Result is number disbursed/destroyed. For anti missile fire add results for number of missiles destroyed.

Air-Air Fire.

1. Use aircraft Air Combat rating (ACR). Subtract 1 from an aircraft's ACR if it is carrying air to ground ordnance (i.e. bombs, ASMs etc.). ACRs reduced below 0 count as 0.
2. When rolling on the above table, add or subtract the target's ACR rating from the die roll.

Bomb Hit Table														
No. of Bombs		-2	-1	0	1	2	3	4	5	6	7	8	9+	
1	1	1	1	1	1	-	-	-	-	-	-	-	-	1
2	1	1	1	1	1	1	1	-	-	-	-	-	-	2
3	3	2	2	1	1	1	1	-	-	-	-	-	-	3
4	4	3	3	2	2	2	2	1	1	-	-	-	-	4
5	5	4	4	3	3	2	2	2	1	1	-	-	-	5
6	6	6	6	5	4	3	3	2	2	1	1	-	-	6

- +1 DD/FF
- +2 FAC or smaller
- +2 Dropped from High or Very High
- 2 Target stationary

Weapon	250lb bombs	500lb bombs	SSM or 1000lb bombs	Large SSMs
Attack Factor	4	6	12	20

Missiles

For each missile which reaches the target, roll a d10. Hits as on table below (or see missile tables):

Missile Type	Roll to hit	Examples
1st generation	1-5	Styx (early missiles)
2nd generation	1-7	Exocet, Harpoon, (most contemporary missiles)
3rd generation	1-8	Harpoon Block 1D (later missiles)

Missile Die Roll Modifiers:

Warship target, standard ECM (radar intact)	0
Warship target, superior ECM (radar intact)	+1
Merchant target, or warship with damaged radar	-2
FAC target	+2

Treat each hit as a separate hit, i.e. do not add missile AFs

Missile hits which cause 1 or more hull box damage automatically start a fire.

