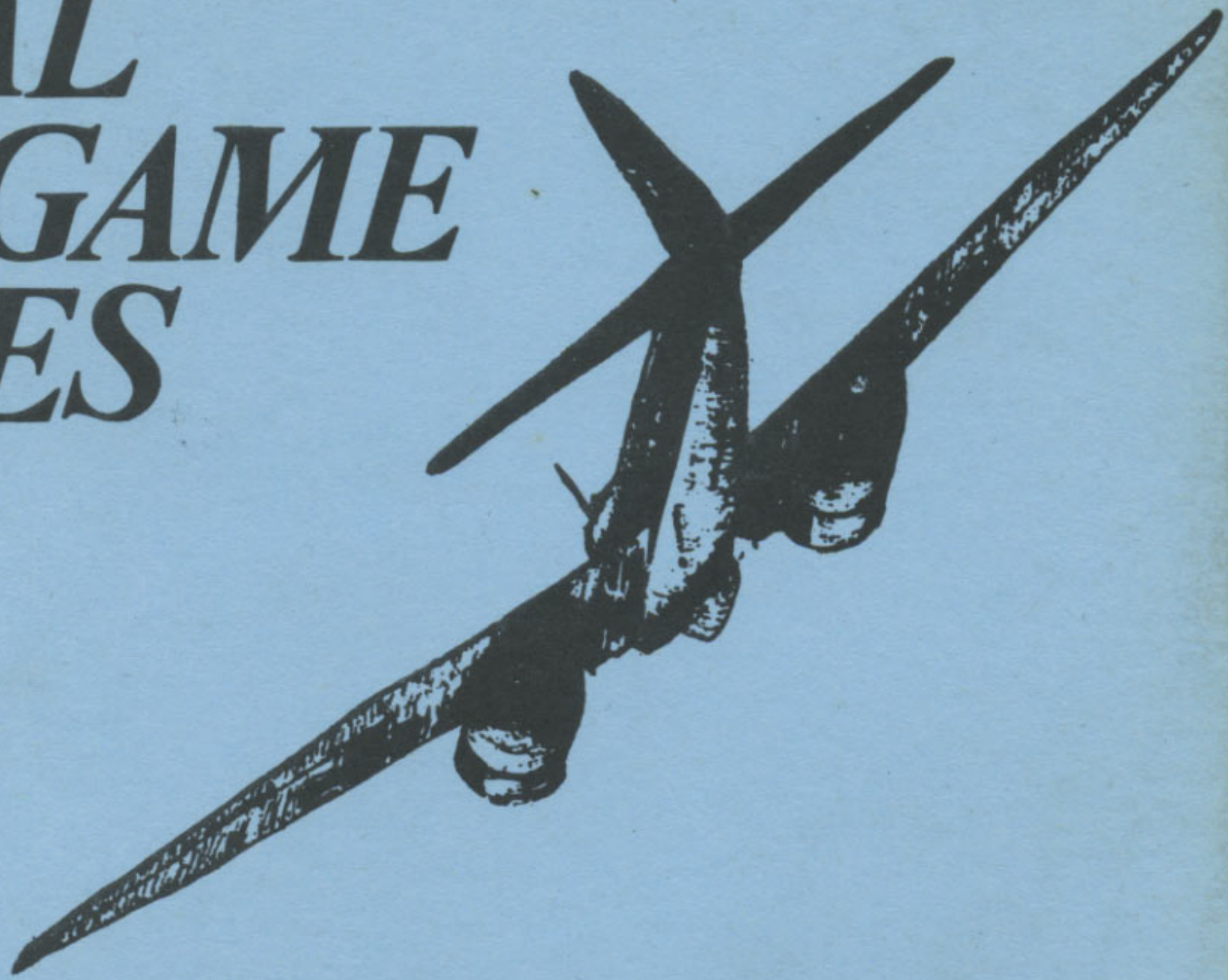


WORLD WAR TWO *NAVAL* *WARGAME* *RULES*



by

R A Ellard

& J E Hammond



WORLD WAR TWO NAVAL WARGAMING RULES

by R.A. Ellard & J.E. Hammond

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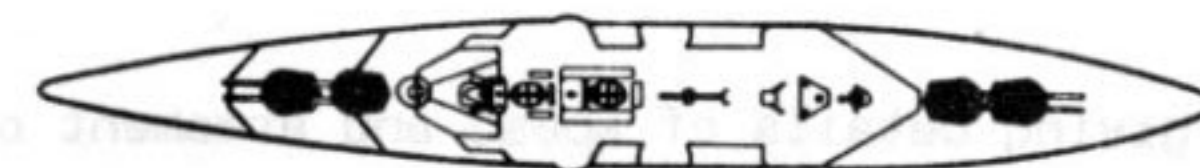
These rules are the culmination of several years thought and although capable of further refinement do provide an enjoyable simulation of naval actions for the period 1929-52. In this period gunnery was brought to a peak of efficiency and was eclipsed by airpower and the submarine fired torpedo as a method of gaining control of the seas.

To recreate the complexity of the period and yet still produce the possibility of fighting a fleet action involving many vessels in less than a day of playing time is a difficult task. Compromise is inevitable with strict realism and accuracy being subordinated to playability and maintenance of interest of all those participating. We realise that the former is important to some players and hope that the rules given herein will provide a base for further development to this section of the hobby. But we feel that most naval wargamers wish to enjoy their battles without too much paperwork and effort and yet still savour the emotions of command in various naval situations, to this section we dedicate our present work.

The rules are designed for use with models and we recommend the use of 1/3000th as the most balanced scale between size of playing area and ease of identification of models. If other scales are used a simple calculation is required to convert the distances appropriately. As our aim was essentially recreation of open sea actions we have not added special rules for light coastal forces or for convoy actions with submarines attacking. For the former we would recommend Coastal Warfare rules by Navwar and the latter U-BOAT by TABLETOP GAMES.

Any questions or comments you have will be most welcome but for replies please include a stamped self-addressed envelope with your letter.

J.E. HAMMOND & R.A. ELLARD, 1977.



HOOD

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Equipment

- Tape measure marked in cms for 1/3000th ideally 3 metres long
- " " " " 1/10" for 1/1200th ideally 15 ft. long
- Pair % dice
- Pair normal dice
- Order Pad
- Smokemarkers
- Damage control sheets giving details of speed and armament of vessel concerned.

A TYPICAL EXAMPLE OF A DAMAGE RECORD CHART

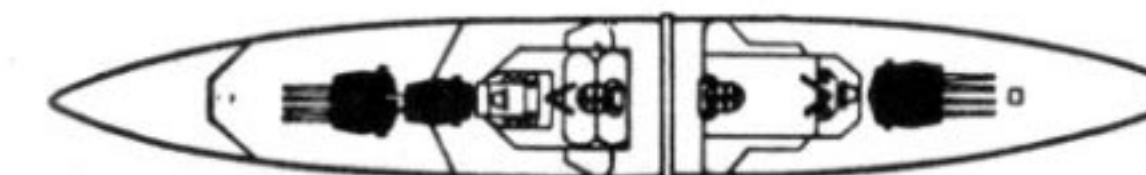
NAME DATE COMPLETED		TONNAGE ARMAMENT ARMOUR THICKNESSES:	SPEED
POINTS VALUE		AA VALUE ZONE A AA VALUE ZONE B	
Move on which damage occurs	Calibre of Shell hit	Amount Damage	Special Effect (if any)

HOW TO WORK OUT A SHIPS POINTS VALUE

Std. Tonnage + 10% if hull completed in 1920's
 20% if hull completed in 1930's
 30% if hull completed in 1940's

e.g. RODNEY = 34,500t + 10% (completed 1928)

34,500
 3,450
37,950 points



PRINCE of WALES

Scales

Sea Scale	1 Nautical mile	= 15cms
Model Scale	1 mm	= 10 ft. i.e. 1/3000th
Time Scale	1 move represents 2 minutes of real time.	
Speed Scale	$\frac{1}{2}$ cm per knot of vessel per move	

Weather

a. VISIBILITY

This is determined for the ensuing battle.

%	Max Visibility	Weather (N.Atlantic)	Pacific or Mediterranean
0 - 5	300cm/3 metres	Clear	Clear
6 - 15	240cm	Haze	Clear
16 - 30	180cm	Mist	Light Squall
31 - 50	150cm	Overcast -perhaps light rain	Light Squall
51 - 70	120cm	Dull - steady rain	Light Squall
71 - 85	100cm	Heavy rain	Heavy Squall
86 - 95	60cm	Sleet	Heavy Squall
96 - 100	30cm	Snow or Night	Storm or Night

Throw a % dice. The weather states are approximate and are intended to bring about situations in which smaller vessels can attack larger ships by taking advantage of poor visibility.

b. WIND (Speed and Direction)

Note: This is used in connection with smoke screens only - see relevant Section (7B)

Wind Direction.

Use 1-10 (%) Dice. Wind comes from.

1.	North
2.	North East
3.	East
4.	South East
5.	South
6.	South West
7.	West
8.	North West
9&10(0)	Dead Calm

Movement & Firing

The following sequence should normally be followed each move although it may be modified at the players discretion. This is most likely to happen in non-critical situations when speeding up play is advantageous to the game.

Ideally both players should write basic orders (speed and direction is usually sufficient) for the next move. Both players then execute these orders on the command "Now!" Both players then fire their ships guns. More realism can be induced by requiring orders to be written for 2 moves hence. This simulates the time-lag between the order and it taking full effect and thus encourages some degree of tactical planning.

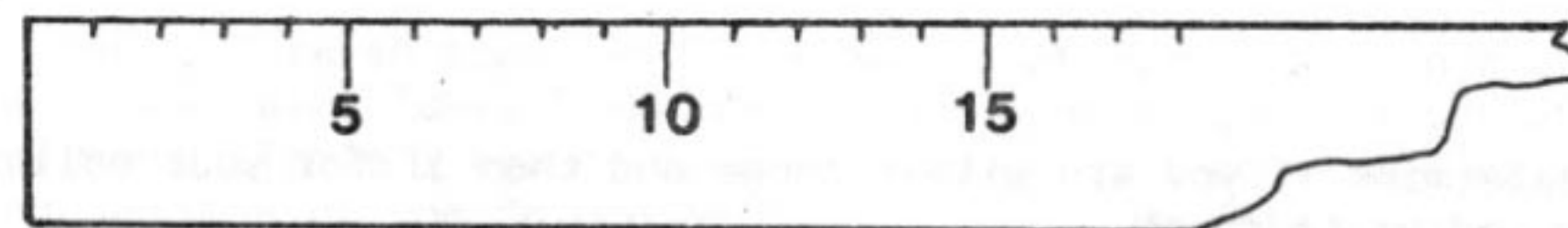
(a) MOVEMENT

Speed is $\frac{1}{2}$ cm per knot of real speed. E.g. a vessel doing 30 knots moves 15 cm. per move.

Increases in speed are restricted to 5 knots ($2\frac{1}{2}$ cm.) per move. Decreases in speed may be as much as 10 knots (5cm.)

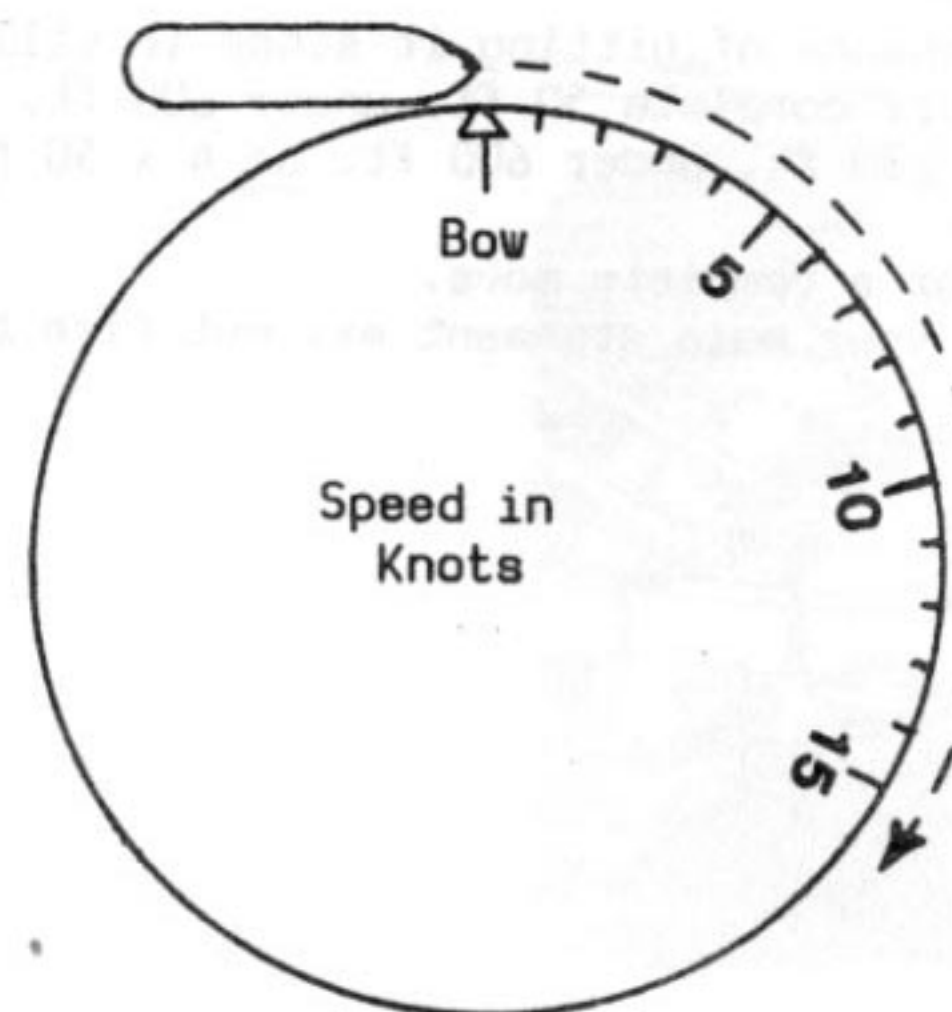
Orders may not be changed and must be adhered to unless battle damage (e.g. loss of speed due to boiler hits) makes this impossible.

For most movement a card Movement Ruler is sufficient. This is merely a strip of stout card marked off in $\frac{1}{2}$ cms. about 20 cms. long. Hence ships can be moved easily at the required speed.



For sharp turns in vital situations a set of three circles are used. Again these are marked off in $\frac{1}{2}$ cm. intervals (knots) and the ships are moved round the edge. Draw these circles again on stout card with a compass. Radii should be 3 cm., $4\frac{1}{2}$ cm., 6 cm. The smallest should be used for all destroyer turns and also cruisers if they are doing less than half speed. The medium one is for cruisers doing above half speed and Battleships, Battlecruisers, and Aircraft Carriers doing below half speed. The largest is for Battleships, Battlecruisers and Aircraft Carriers doing full speed.

Mark them as below and use them by placing the "Bow \uparrow " next to the bow of the ship and move the ship around the circle.



After movement is complete firing takes place.

(b) FIRING

In World War II firing usually occurred at medium to long range with ships dividing their main armament into two or more firing phases. Salvos as they were called were used in an effort to obtain consistent hitting of the target with a minimum of "wild" shots. A cruiser with 8 x 8" guns would fire one salvo of four shells; plot its fall relative to the target; correct the aim and then fire the second salvo and so on until consistent hitting was obtained. At long range one hit per salvo was all that could be hoped for - closing the range produced more likelihood of perhaps 2 or 3 hits per salvo and also made penetration of the opponent's armour more likely and thus the chance of causing vital damage, a possibility.

For long ranges guns needed to be elevated to near maximum - the shells thus have a high trajectory. This tended to produce deck and superstructure hits since the shells arrived near the target at a steep angle. Conversely at short ranges the shells followed a very flat trajectory and would rarely hit the deck - most hits would occur on the belt or the superstructure.

It will be seen from the tables and firing method we have tried to reflect all this in a simplified form. Salvos were fired as follows:-

A ship with 6 guns firing fires 2 x 3 gun salvos
A ship with 7 guns firing fires 1 x 3 gun salvo + 1 x 4 gun salvo
A ship with 8 guns firing fires 2 x 4 gun salvos
A ship with 9 guns firing fires 1 x 4 gun salvo + 1 x 5 gun salvo
A ship with 10 guns firing fires 2 x 5 gun salvos
A ship with 12 guns firing fires 3 x 4 gun salvos

To fire a ships guns:-

1. Consult Table 1 to determine if you are within range and then if for your calibre guns the range is long or medium to short.
2. Ensure that you are not firing through another ship. Any ship directly between you and your target impedes your fire unless you are larger than it and are at least 10 cm. away from it
3. Decide how many guns can fire. You cannot fire through your own superstructure or turrets. This is especially relevant when ships are fighting each other on less than parallel courses.
4. Guns of 8 in calibre and under fire twice per move thus simulating the higher rate of fire of smaller calibre guns.
5. Divide your firing guns into salvos as above.
E.G. British 8" gun cruiser firing six guns fires 2 x 3 gun salvos twice i.e. 4 x 3 gun salvos.
6. Measure the distance between opponents measuring from bow to bow. If this is over 180cm. consult Table 2; if under 180 cm use Table 3. These will give % chance of a hit or hits. Roll % dice for these.
7. If your target is small you will have less chance of hitting it since it will be correspondingly more manoevrable. So for every complete 50 ft. under 600 ft. add 5% to the % dice rolls. E.G. 370 ft. Destroyer is 230 ft. under 600 ft. or 4 x 50 ft. so add 4 x 5% - 20% - to any % dice rolls.
8. If you change target you must stop firing for a complete move.
9. If you turn your ship through more than 60° your main armament may not fire that move.

(c) EFFECT OF HITS

In all ships of cruiser size or larger, the vital parts of the vessel (e.g. engines, boilers, guns, etc) were protected by armour plate. It was necessary to damage or destroy these vital areas before the vessel could be caught and sunk. Hits on unarmoured parts usually caused extensive but superficial damage which did not normally impair the fighting efficiency of the ship to any great degree. To damage these vital parts the range had to be closed to the point at which the attackers shells would penetrate the armour protection thus allowing the explosive energy of the shell to be effective.

Sooner or later you will obtain hits on your target. We then use Table 4 to decide the position of these hits. Roll % dice for each hit. Refer to the column which is both the type of ship your target is and the range (Long or Medium- Short) that it is at. Refer back to Table (1) if necessary for the latter.

Hits on unarmoured parts automatically destroy them whilst those on armoured parts may or may not. Basic information on armour thickness is given in most reference books and we particularly recommend the Ian Allan series on World War II navies. The main areas of armour are the Belt, the Deck and the Turrets. The thickness of armour in these places is usually provided with 1/3000 models information sheets.

A shell which hits an unarmoured place will destroy it and cause the damage points for a non penetrating hit in Table (1). If it is a specific piece of equipment like a crane or a hanger it automatically becomes useless.

A shell which hits an armoured place may penetrate. Check your opponents armour thickness, the range and using Table 5 decide whether penetration has occurred. Remember shells fired at long range (Table 1 again) from large guns will penetrate half as much again at a given distance because of the "plunging fire" effect. Penetrating and non-penetrating hits cause damage points as indicated in Table 1.

Remember a penetrating hit is only caused by a shell that has penetrated armour, all others are non-penetrating hits. Again penetrating hits destroy specific pieces of equipment.

In addition to these damage points which are deducted from the target vessels there are special effects which hits on certain places cause. These, and the results of them are to be found on page 12 under special effect hits.



table 1 GUN RANGES & DAMAGE VALUES (15cm = 2000yds. = 1 nautical mile)

Gun	Long Range Max. Range	Med. & Short Range	Damage		Type of Ships
			Pene- trat- ing	N.-P	
16"	340-225	225-0	4535	1130	BRITISH Rodney Q.E.'s, "R" class, Hood, Repulse KG. V. class Most Heavy Cruisers Most Light Cruisers; Rodney 2ndary Hawkins K.G. V's 2ndary, Dido main DD's A-I, J,K,L,M,N,O S-Z Battles, Darings 2ndary. guns on many B.B. C.A. CL P class destroyers, Hunt class destroyers
15"	260-170	170-0	4375	1090	
14"	300-200	200-0	3540	885	
8"	240-160	160-0	581	145	
6"	195-130	130-0	254	60	
7.5"	170-110	110-0	500	120	
5.25"	190-125	125-0	192	45	
4.7"	170-110	110-0	113	25	
4.5"	170-110	110-0	125	30	
4"	150-100	100-0	70	15	
16"	300-200	200-0	4100	1050	GERMAN Planned for 'H' class battleships Bismark Scharnhorst, Spee, Lutzow, Scheer Hipper, Eugen C.L.'s, D.D.'s, Z23-34, Z37-42 D.D.'s, Z1-22 +35,36, T.22 AA. on all BB, BC, CA AA. on CL. Minesweepers and small escorts
15"	300-200	200-0	3990	995	
11"	350-230	230-0	1575	390	
8"	280-195	195-0	592	150	
5.9"	180-120	120-0	216	50	
5.1"	170-110	110-0	140	35	
4.1"	120- 80	80-0	75	15	
3.9"	120- 80	80-0	70	15	
16" new	300-200	200-0	6120	1530	U.S.A. Iowa, S.Dakota, N.Carolina Colorado, West Virginia New M. Ten. Cal CA CL DD. AA. on most CA, BB, CL Alaska
16" old	250-165	165-0	6120	1530	
14"	250-165	165-0	3175	790	
8"	240-160	160-0	590	145	
6"	220-160	160-0	260	75	
5"	130- 90	90-0	120	30	
12"	275-180	180-0	2500	625	
18"	360-240	240-0	7300	1825	JAPAN Yamato Nagato Ise; Fusu; Kongo All CA Yamato 2ndary, Agano, Oyodo CL. BB 2nd DD's. AA on most CA, BB, CV early DD's, 2nd AA some CA, CV
16"	340-225	225-0	4965	1240	
14"	310-205	205-0	3375	840	
8"	240-160	160-0	629	155	
6.1"	245-160	160-0	278	65	
5.5"	180-120	120-0	190	45	
5"	120- 80	80-0	115	25	
4.7"	120 -80	80-0	110	25	
15"	350-230	230-0	4410	1100	ITALIAN Littorio's Doria, Caesare CA CL. 2nd Littorio's Doria, Regolo Caesare. DD CA's Caesare. DD's Littorio's, Doria
12.6"	240-160	160-0	2625	655	
8"	245-160	160-0	600	150	
6"	190-125	125-0	240	60	
5.3"	160-105	105-0	160	40	
4.7"	170-110	110-0	115	25	
3.9"	125- 80	80-0	69	15	
3.5"	105- 70	70-0	50	10	
15"	350-230	230-0	4450	1110	FRENCH Richelieu Provence Dunquerque Courbet Suffron, Tourville, Algeria Richelieu 2nd. Light Cruisers Courbet & Provence, Mogador Dunquerque, DD's Jean Bart, Lorraine, Provence, Richelieu
13.4"	200-130	130-0	2770	690	
13"	340-225	225-0	2800	700	
12"	215-140	140-0	2160	540	
8"	240-160	160-0	600	150	
6"	220-145	145-0	270	65	
5.5"	130- 85	85-0	197	45	
5.1"	170-110	110-0	160	40	
3.9"	125- 80	80-0	74	15	

table 2 % CHANCE OF A HIT PER SALVO AT OVER 180CMS. (24,000 yds)

No. of guns per salvo.	Range (cm/yds)							
	180-195 24,000	195-210 26,000	210-225 28,000	225-240 30,000	240-255 32,000	255-270 34,000	270-285 36,000	285-300 38,000
2	20	18	14	12	10	8	5	5
3	30	26	18	14	12	10	5	5
4	35	28	23	16	13	11	5	5
5	40	30	25	20	15	13	8	5

table 3 HITS PER SALVO AT LESS THAN 180 CMS. (24,000 yds)

No. of guns per salvo		Range (cm/yds)						
		0-15 0-2000	15-37 2000- 5000	38-59 5000- 8000	60-90 8000- 12000	91-119 12000- 16000	120-150 16000- 20000	151-180 20000- 24000
1 or 2	A	36-99	31-85	26-70	21-60	16-50	11-40	11-30
	B	0-35	0-30	0-25	0-20	0-15	0-10	0-10
3	A	46-99	41-85	36-75	31-65	21-60	16-55	11-50
	B	26-45	21-40	16-35	11-30	6-20	0-15	0-10
	C	0-25	0-20	0-15	0-10	0-5	-	-
4	A	51-99	46-90	41-80	36-70	26-65	19-60	11-55
	B	31-50	26-45	21-40	16-35	11-25	6-18	0-10
	C	0-30	0-25	0-20	0-15	0-10	0-5	-
5	A	61-99	56-99	51-90	46-85	36-80	21-70	11-60
	B	36-60	31-55	26-50	21-45	16-35	11-20	6-10
	C	0-35	0-30	0-25	0-20	0-15	0-10	0-5

A = 1 hit
B = 2 hits
C = 3 hits

table 4

POSITION OF HITS ON THE TARGET

Port or Starboard (P/S) Hits occur always on the side of the vessel facing the enemy. If the position of the hit is in doubt or dispute the position may be determined using the diagram on the left of the chart.

Pos. of Hit	% Die Roll	Target Vessel Type			
		Aircraft Carrier	Battleship/Cruiser	Cruisers	Destroyers
		Long Range Bows	Short Range Bows	Long Range Bows	Short Range Bows
	1-5	Catapult (Deck)	"A" Turret	"A" Turret	"A" Mount
	6-10	Hull	"B" Turret	"B" Turret	"B" Mount
	11-15	P/S MainAA	Upp.Bridge	"C" Turret	"B" Mount
	16-20	P/S MainAA	Lwr.Bridge	Bridge	Bridge
	21-25	Bridge	P/S 2nd.Tur	P/S 2ndTur	Hull "A"
	26-30	Deck	Belt(?) "A"	End Deck	AA
	31-35	Deck (Alift)	Hanger Side	End Deck	Funnel "A"
	36-40	Deck	Hanger Side	P/S 2ndTur	"C" Turret
	41-45	AA	AA	Funnels/Deck "A"	Funnel "A"
	46-50	Deck	Hanger Side	P/S 2ndTur	1st TT/Deck
	51-55	Dk(B lift)	Hanger Side	Hanger/Dk.	S/L Platf. S/L Platf
	56-60	Deck	Belt(?) "B"	Mid.Deck/ Cranes "A"	2nd TT
	61-65	AA	AA	P/S 2ndTur	Deck B
	66-70	Deck	Hanger Side	Mid.Deck "B"	3rd TT/Deck
	71-75	Deck (C lift)	Hanger Side	End Deck	AA. Platf. AA. Platf
	76-80	Deck	Hanger Side	End Deck	4ft. TT/Deck
	81-85	P/S MainAA	P/S MainAA	Aft. SS (AA)	Deck
	86-90	P/S MainAA	P/S MainAA	Aft. SS (AA)	Aft. SS
	91-95	Round-down	Hull	X Turret	X Turret
	96-100	Stern	Stern	Y Turret	Y Mount
				Stern	Stern

Abbreviations

P/S = Port or Starboard
 TT = Torpedo Tubes
 S.S. = Superstructure

Cat. = Catapult
 AA = Anti-Aircraft
 SL = Search lights

N.B. When the chart gives a hit on equipment not present on the target vessel e.g. 4th set of TT when the target has only 3 sets of TT then the hit is regarded as a dud shell and no damage occurs.

table 5

RANGE AT WHICH VERTICAL ARMOUR IS PENETRATED (cm.)

GUN Cal	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
18"	ANY	280	270	260	250	240	230	220	210	200	190	180	170	160	150	140	130	120	110	100
16"	280	270	260	250	240	230	220	210	200	190	180	170	160	150	140	130	120	110	100	90
15"	260	250	240	230	220	210	200	190	180	170	160	150	140	130	120	110	100	90	80	70
14"	240	230	220	210	200	190	180	170	160	150	140	130	120	110	100	90	80	70	60	50
13"	220	210	200	190	180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	30
12"	200	190	180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	30	20	10
11"	180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	30	20	10		
8"	140	130	120	110	100	90	80	70	60	50	40	30	20	10						
7.5"	120	110	100	90	80	70	60	50	40	30	20	10								
6"	100	90	80	70	60	50	40	30	20	10										
5"	80	70	60	50	40	30	20	10												
4.7"	70	60	50	40	30	20	10													
4.5"	70	60	50	40	30	20	10													
4.0"	60	50	40	30	20	10														
3"	40	30	20	10																

At a gun's long range (see Chart 1) guns of 11" and over will penetrate $\frac{1}{2}$ as much armour again. e.g. between 225-340 cm. for a British 16". Range: 260 cm. vertical pen. 3" but = long range 4 $\frac{1}{2}$ " pen.

Special Effect Hits

In special cases hits cause more damage than merely deducting points from a ships value. This is detailed below.

1. Bows - reduce speed by 3 knots if shell 8" or more.
2. Turret - penetration destroys all guns within.
3. Bridge - upper bridge (BB,BC) and bridge hits may destroy vital equipment.
 - (1. Wheelhouse. Ship must continue on its present course for three moves while aft steering position is manned. If destroyed ship is beyond control. Must stop.
 - (2. Conning Tower. Capt. killed, maintain present course for next move while command is reorganised.
 - (3. Director out of action. 15% of chance of hits with gunnery.
 - (4. S/Light out and other minor items.
 - (5. Radar beacon shattered.
 - (6. No significant damage.
4. A.A. - dice Ship loses 1 - 6 AA points. (using 1 - 6 dice)
5. Deck - Check for penetration. End deck is always $\frac{1}{2}$ Mid. Deck thickness. Penetration at "A" (see table) means boiler rooms affected. Steam lost. Dice with a single % dice. Ships lose 1-10 knots speed. Dice each subsequent move with 1-6 dice, 4, 5, 6, = 2 knots regained.
6. Belt - Also check for penetration. End belt $\frac{1}{2}$ Mid. Belt thickness. Penetration at "B" (see table) means engine room affected. Machinery damaged - permanently. Ship loses 1-6 dice x 2 knots i.e. die = 3: 3 x 2 = 6 knots, ship loses 6 knots of speed until next refit/repair.
7. Hangers - 50/50 chance of AV. gas FIRE. 1-6 dice. 1-3 no: 4-6 yes. additional damage points occur every move until fire put out. initially 100 pts. then 200 (2nd turn) then 400 (3rd turn) then 800 (4th turn) etc. each move. Dice (1-6) 5 or 6 needed to put fire out.
8. Torpedo Tubes $1\frac{1}{2}$ times damage points. except Japanese 2 x damage pts.
9. Cranes and Catapults and Search Light hits makes the equipment inoperable.

The target is then made to suffer from hits in two ways. It receives hits which cause no specific damage, but gradually reduces its total points value. When this reaches 0 it will sink. Also occurring are hits which are not having a great effect on the ships points value but are knocking out important pieces of equipment vital to the ship's fighting efficiency. These will eventually affect its ability to defend itself and ultimately leave it helpless to prevent enemy vessels closing it and ultimately sinking it.

AN EXAMPLE OF THE FIRST SALVOS OF A SEA BATTLE

Renown encounters the Scharnhorst on an overcast day in the North Atlantic. Visibility is good since a 12 is thrown with % dice to give a haze on the horizon. The two ships are placed 240 cm. apart on the floor. Movement occur first, both ships are travelling at 30 knots or 15 cm. per turn. Firing now takes place. Scharnhorst having 9 x 11 in. guns fires one salvo of 4 shells and one of 5. These are fired at long range which for Scharnhorst is between 350-230 cm. (Table 1). The range is 237 cm. At 225-240 cm. range the 4 and 5 gun salvos have 16% and 20% chance respectively of obtaining one hit each. No hits are obtained.

Renown returns fire. She has 6 x 15 in. guns. These fire in 2 salvos of 3 shells each. They are also firing at long range which for Renown is between 260-170 cm. At 237 cm. range she has 14% chance of a hit from each salvo (Table 2). The first salvo is a miss (76%) but the second one obtains a hit (07%). The player then consults Table 4, rolls % dice (17) and finds he has hit the upper bridge. (The long range column is used). On consulting the Special Effects Hits instructions he discovers that he may have caused quite vital damage. He rolls a 1-6 dice and obtains a hit on the conning tower(2) killing the captain and so the Scharnhorst is unable to change course next move. The upper bridge has no armour protection to speak of so penetration is automatic and causes 1,090 damage points on Scharnhorst as a non vital penetrating hit. Had this shell hit and penetrated armour at this range the damage would have been 4,375 pts. as a vital penetrating hit. (The theory being that armour protects vital areas of the ship)

Torpedoes

These can have the effect of slowing the game down if used extensively. Accordingly, we advise a sparing use of these weapons thus reflecting their normal infrequent use in action.

The chance of a torpedo hit varies with many factors, we include only those causing the greatest likelihood of error.

(A) Torpedo firing and calculation of hits

1. Torpedoes are fired at the beginning of the move, before ship movement.
2. A mark is placed on the playing surface at the point of firing.
3. The player firing the torpedo notes on the marker name of target, torpedo speed, number of tubes fired, and torpedo depth settings - see tables (6) and (7)
4. Both players carry on with ship movement, firing guns etc.
5. Ship movement, firing etc. is all completed for the next move and then at the end of the move the chance of hitting is calculated using table (8). The range being measured from the firing marker to the bow of the target vessel.

table 6 TORPEDO RANGES

Torpedoes are set before firing with respect to their estimated run and depth. The latter will depend on the target as the ideal is to hit the weaker lower side and bottom of the target to cause maximum damage. This will naturally be deeper for battleships than for destroyers.

The estimated run or range to target is important as the shorter the run the faster the torpedo can travel using the same amount of propelling force.

RANGE TABLE

Type	Short Run	Normal Run	Long Run
British, German, French, Italian, and U.S.	65cm & 40kts	90cm & 35kts	115cm & 30kts
Japanese	180cm & 49kts	320cm & 36kts.	

table 7 DEPTH SETTING TABLE

Target Ship	Depth of Torpedoes		
	Shallow	Medium	Deep
BB, CV	Hit	Hit	Crit. Hit
CA, CL, CVE	Hit	Crit.Hit)
DD, DE	Crit.Hit	Runs under)
SS	Sunk	Runs under) Runs under
Merchants/ Tankers	Crit.Hit	Crit.Hit)

CALCULATION OF HITS

The basic chance of hitting a target with a torpedo travelling at 30 knots at different ranges is given in Table 8 for a 300 ft. target travelling at 15 knots.

A pair of % dice are thrown and the following additions and subtractions made where appropriate from the basic chance given in Table 8:-

ADD

- (1) 5 for each complete 150 ft. of the target's length over 300 ft. providing the range is under 90 cms.
- (2) 5 if the target is more than 30° broadside to the firing marker.
- (3) 5 for each 2 knots of target speed under 15 knots.
- (4) 1 for every knot of speed of torpedo over 30 knots.

SUBTRACT

- (1) 10 for each additional complete 5 knots of target speed over 15 knots.
- (2) 5 for each complete 50 ft. under 300 ft. of target length.
- (3) 15 if the target is less than 30° broadside to the firing marker, i.e. presents a smaller target.

table 8 BASIC CHANCE TORPEDO HIT TABLE

No. of Torpedoes Fired	Range of Target (cm/yds) from firing marker						
	15-30 (4000)	30-45 (4000-6000)	45-60 (6000-8000)	60-90 (8000-12000)	90-150 (12000-20000)	150-250 (20000-34000)	250+ (34000+)
1 A	0-50	0-30	0-10	0-5	0-5	-	-
1 B	-	-	-	-	-	-	-
2 A	26-55	6-35	0-15	0-7	0-5	-	-
2 B	0-25	0-5	-	-	-	-	-
3 A	31-60	11-40	6-20	0-10	0-7	0-5	-
3 B	0-30	0-10	0-5	-	-	-	-
4 A	33-65	13-45	8-25	6-12	0-7	0-5	-
4 B	0-32	0-12	0-7	0-5	-	-	-
5 A	36-70	16-50	11-30	6-15	6-10	0-7	0-5
5 B	0-35	0-15	0-10	0-5	0-5	-	-
6 A	38-75	18-55	13-35	11-17	8-10	0-7	0-5
6 B	0-37	0-17	0-12	0-10	0-7	-	-

A = one hit; B = two hits.

(B) **TORPEDO DAMAGE** Throw 1-6 dice 1 - 2 = forward (bow) hit
3 - 4 = amidships hit
5 - 6 = aft hit

Pt. Damage

Position of Hit		
Fwd.	Amidships	Aft
500	700	600
x 1 - 6 die score		

To the above basic damage points:-

ADD

- 1. Another 50% to original damage if hit is critical
- 2. 500 pts. if target moving at 30 knots+
- 3. 250 pts. if target moving at 20 knots+
- 4. 250 pts. each subsequent turn if the flooding is not controlled. To determine this a 6 must be thrown on a 1 - 6 die.

(1) Bow Hits - Throw 1 - 6 dice. Number on dice gives reduction of speed in knots

(2) Aft Hit - Throw 1 - 6 dice. 6 = hit on propellers and rudders; vessel immobilized

Aircraft

Aircraft in naval wargaming are a very complex problem. To construct a completely authentic set of rules that will cope with ships A.A. defence, different types of attacks on ships, escorting fighters (C.A.P.) etc. is very difficult and will, of necessity, be extensive in detail and more often than not drawn out in practice. Although we have the basis of such a set, it is as yet unrefined and would be out of place in this context being as it is a set of surface action rules. What follows is a rough and ready series of guide lines for players who wish to chance ships against aircraft. It uses as its basis waves of 5 Aircraft (available from Skyrex) which may be dive bombers, skip bombers or torpedo bombers. A.A. fire from the vessel attacked and others in close contact (see rules) may take its toll of the attackers and then the remaining aircraft deliver their bombs/torpedoes.

A. A.A.POINTS VALUE

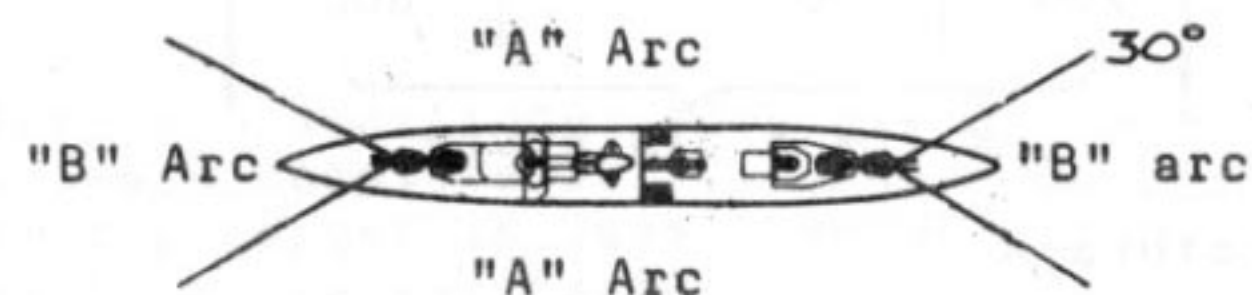
This is the combined value of the ships A.A. armament. To obtain this multiply the number of guns between 3" and 6" by 3, the number of guns between 30mm - 40mm by 2 and add the number of guns between 20mm - 29mm together.

Thus we may have

8 x 4in	=	(8x3)	=	24 pts
16 x 37mm	=	(16x2)	=	32 pts
10 x 20mm	=	(10x1)	=	10 pts

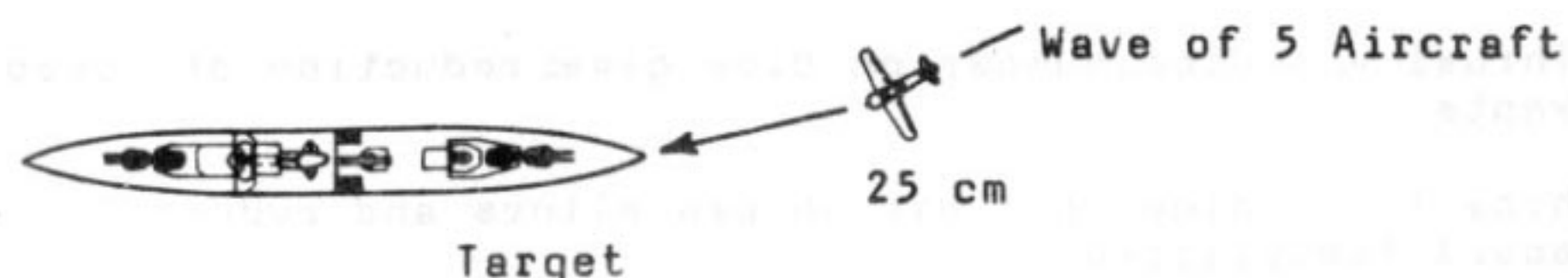
66 A.A. points

The A.A. points will give us the total A.A. firepower of the ship. The proportion that can fire will depend on the quarter from which the attackers come. The simplest way of deciding this is to use the diagram below and divide the ships A.A. umbrella into "A" arcs and "B" arcs into which $\frac{1}{2}$ and $\frac{1}{4}$ of the total A.A. value may fire respectively. If rather more authenticity (and perhaps argument) is required the attacker may be given 10 secs. to decide upon his line of attack and must then place his wave on the chosen quarter and the stated 25 cm. Then any A.A. that can bear on the wave without firing through superstructure - other turrets etc. may be added up and used in the A.A. firing value. This gives the attacker a quick glance to evaluate the most likely line of attack (i.e. least resistance) and brings some degree of skill into the attack.



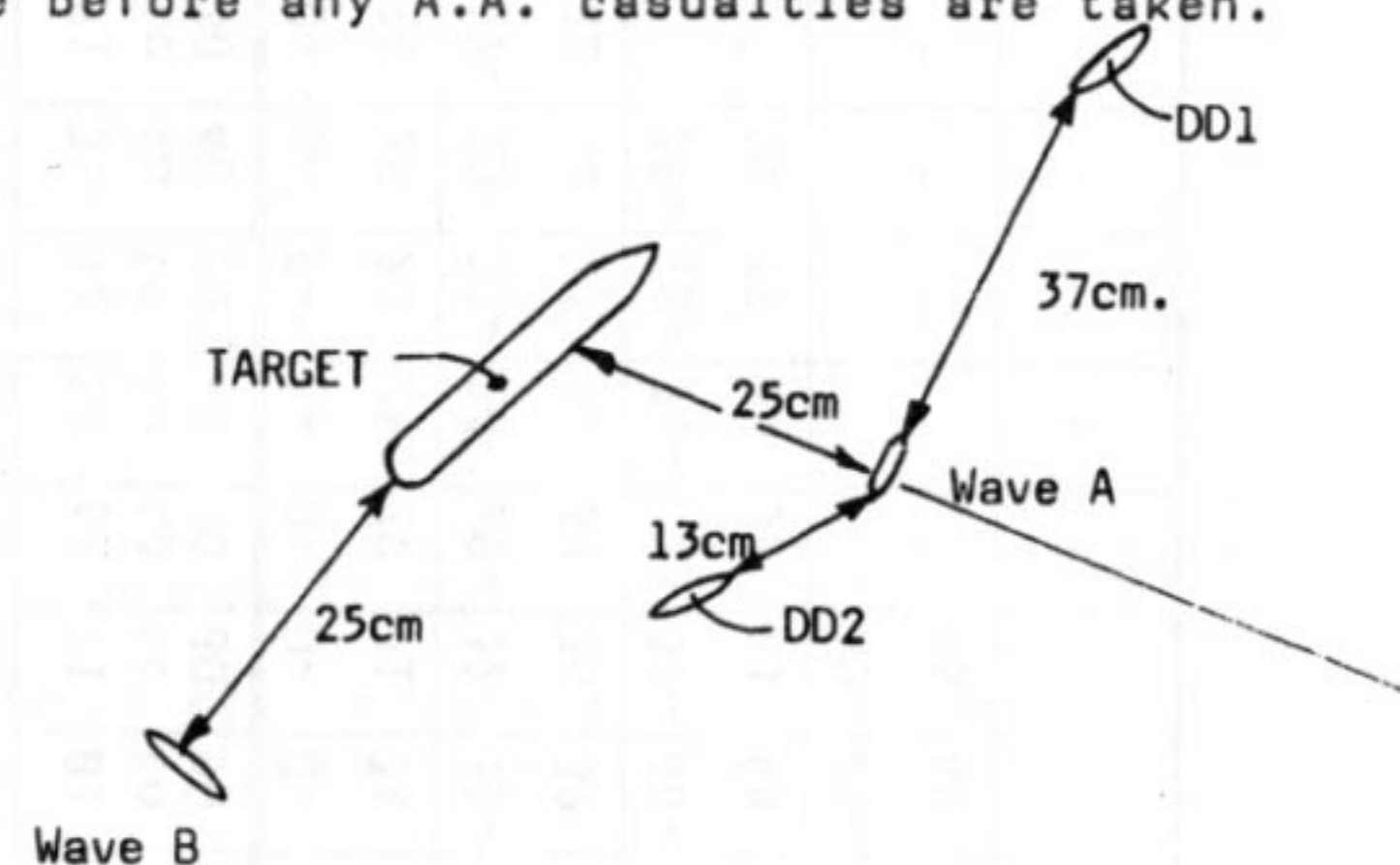
B. AIRCRAFT ATTACK SEQUENCE

The type of attack and the direction of the approach to the target is stated or shown by the player placing his wave or waves of aircraft on the floor/board 25 cm. from the target along the direction of the attack.



The defending player may now fire A.A. at these aircraft. Any ships within range may fire that proportion of their A.A. fire that is applicable ("A" or "B" arcs) or can bear depending on the players choice. This is also dependant on being in range (See Table 9). Each ship must designate its target wave before any A.A. casualties are taken.

Example



Waves A and B attack the same target a capital ship. This may fire at both of them but may need to divide its A.A. firepower. If using a + b arcs; A arc (= $\frac{1}{2}$ A.A. points total) may fire at wave A and B arc (= $\frac{1}{4}$ A.A. points total) may fire at B. D.D.2 can fire its Long and Medium range A.A. at Wave A as it passes although this must only be $\frac{1}{4}$ of these combined points values since it will be in DD.2's B arc. DD.1 may fire B arcs long range A.A. since it is just within range of Wave A.

table 9 AA GUN RANGES

Gun	Range	A.A. Pt. Value
3 - 6in	Long 80cm.	3
31mm- 40mm	Med. 40cm.	2
20mm- 30mm	Short 10cm	1



EXETER

table 10

AA CASUALTIES TABLE

		A.A POINTS FIRING																					
	0 to 10	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60	61 to 70	71 to 80	81 to 90	91 to 100	101 to 110	111 to 120	121 to 130	131 to 140	141 to 150	151 to 160	161 to 170	171 to 180	191 to 200	201 to 210	211 to 220	221 to 230	231 to 240
A	0-	0-	0-	0-	0-	0-	0-	0-	0-	0-	0-	0-	0-	0-	0-	0-	0-	0-	0-	0-	0-	0-	0-
B	11-15	14-18	17-22	20-24	23-27	26-30	29-33	32-36	35-39	38-42	41-45	44-48	47-51	50-54	53-57	56-60	59-63	62-66	65-69	68-72	71-75	74-78	77-81
C	-	-	-	25-29	28-32	31-35	34-38	37-41	40-44	43-47	46-50	49-53	52-56	55-59	58-62	61-65	64-68	67-71	70-74	73-77	76-80	79-83	82-86
D	-	-	-	-	-	-	-	42-46	45-49	48-52	51-55	54-58	57-61	60-64	63-67	66-70	69-73	72-76	75-79	78-82	81-85	84-88	87-91
E	-	-	-	-	-	-	-	-	-	-	-	-	62-66	65-69	68-72	71-75	74-78	77-81	80-84	83-87	86-90	89-93	92-96
		SKIP BOMBING																					

Dive Bombers deduct 10 from all figures in appropriate column
Torpedo Bombers add 5 to all figures in appropriate column.

- A = 1 damaged
- B = 1 Shot down
- C = 1 Shot down + 1 Damaged
- D = 1 Shot down + 2 Damaged
- E = 2 Shot down + 2 Damaged.

Each ship takes casualties separately. This is decided using percentage dice + Table 10. The table is for skip-bombing - if dive bombers are attacking take 10 off all the figures in the appropriate column. If torpedo bombers are used add 5 to these.

After all A.A. casualties have been recorded the remaining aircraft execute their attack.

- (i) Torpedo Attack.
This occurs in a very similar manner to destroyer/cruiser torpedo attacks. A marker is placed at the point from which the torpedoes are fired (i.e. 25cm) from the target. After two moves have elapsed possible torpedo hits and effects are calculated just as recounted in Section 5 on torpedoes. It should be noted that a torpedo's target and depth must be specified. The number of torpedoes per salvo is the number dropped per wave, i.e. the number of surviving attackers. All aerial torpedoes travel at 40 knots.
- (ii) Dive bombers all carry one 1000 lb bomb.
Skip bombers all carry 4 500 lb bombs

table 11 PERCENTAGE CHANCE OF BOMB HIT

Type of Ship	Skip Bombers	Dive Bombers
Carriers-Battleships	20% per bomb	30%
Cruisers	15% per bomb	20%
Destroyers, Escorts	10% per bomb	10%

Hits are calculated using Table 11 and % dice. Hits per bomb per surviving attacker.

Example: 5 skip bombers attack a cruiser.
2 are shot down. Between them the remaining 3 have 12 500lb bombs.
Throw 12 pairs % dice to determine number of hits,

Dive bombers with 1000 lb. bombs hit horizontal surfaces and will penetrate 6 inches of armour.

Skip bombers with 500 lb. bombs hit vertical surfaces (i.e. belt) and penetrate 3 inches of armour.

Point of impact is decided by using % dice and Table 4 and the long range columns for dive bombing and the medium-short range columns for skip bombing

Non-penetrating hits cause the same number of points damage as the poundage of the bomb i.e. 500 or 1000 respectively. Penetrating hits are this number multiplied by the score on a 1 - 6 dice roll.

Bomber	Bombs	Position of Hits	Will Penetrate	Damage	
				Pen	Non-Pen
Dive	1x1000 lb	Vertical surface using long range columns in Table 4.	6"	1-6x(1000)	1000
Skip	4x 500 lb	Horizontal surface using Med/Short range cols in Table 4.	3"	1-6x(500)	500

miscellaneous

(A) MINES

The mechanism for laying and sweeping mines will not be discussed in these rules.

However the effect of vessels entering minefields is relevant as minefields provide useful tactical obstructions and boundaries for a table top fleet action thus producing some constraint on freedom of action and enhance game play.

The chance of hitting or effecting the detonation of a mine (in the case of influence mines) varies with the density of the field and the type of mine present. The table below gives a guide to this. Throw a pair of % dice for each vessel entering the minefield for each move or part of a move that it is within the minefield boundaries.

Density of mines per square mile	10	20	30	40	50	60	70	80	90	100	120
% chance of a hit	5	10	15	20	25	30	35	40	45	50	55

double the above figures for magnetic mines unless the vessel concerned is degaussed.

DAMAGE BY MINES

Pts. damage = 1 - 6 dice throw x 1500

Special effect in all cases; an immediate reduction of speed by $\frac{1}{2}$ to simulate unseating of equipment and machinery.

(B) SMOKESCREENS-Protect threatened vessels from visually directed gun fire. A smokescreen can be laid by any vessel either chemically or by increasing the amount of unburnt fuel oil. They should be represented by laying cotton wool from the stern of the vessel producing the screen, the amount being produced per move equalling the distance moved by the vessel in that move. Smokescreens in still air will disperse slowly but if any sort of wind is present the screen will drift in the direction of the wind and disperse more rapidly. The chart below gives detail of speed of drift and dispersion.

Wind Speed	Speed of drift in direction of wind	Length of time each section of smokescreen remains present
Gentle	3 cms.	8 moves
Moderate	6 cms.	4 moves
Rough	12 cms.	2 moves
Still air	Nil	15 moves

