

BASIC COMBAT & SEARCH TABLES

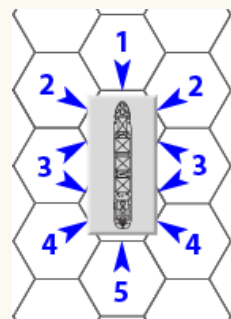
DAMAGE TABLE

DAMAGE TABLE															Damage Point Modifications	
Die Roll	Damage Factor														Magnetic Torpedo	Acoustic Torpedo
	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11		
1	0	1	1	1	1	2	2	2	4	6	8	10	10	10	+5	-5
2	0	0	1	1	1	1	1	2	2	4	6	8	10	10	+4	-4
3	0	0	0	1	1	1	1	1	1	2	4	6	8	8	+3	-3
4	0	0	0	0	1	1	1	1	1	1	2	4	4	6	+2	-2
5	0	0	0	0	0	0	1	1	1	1	1	2	2	4	+2	-2
6	0	0	0	0	0	0	0	0	0	0	0	1	1	1	+1	-1

DEPTH CHARGE ATTACK TABLE

Sub Defense Type	Depth Charge Type					
	250 or 300 lb.		600 lb.		Teardrop	
	Same Depth	Within 50 ft.	Same Depth	Within 50 ft.	Same Depth	Within 50 ft.
1	3	-1	4	1	5	3
2	4	0	5	2	6	4
3	4	1	5	3	6	5

TORPEDO DETONATION TABLE



Target Defense Type	Torpedo Attitude					Die Roll Modifications				
						TORPEDO TYPE			Shallow Running	Target "dead in water"
	U.S. Prior to F '43									
	Japanese	Acoustic								
1	1	1	3	2	1	0	0	-1	0	-1
2	1	2	3	2	1	0	+1	-1	0	-1
3	1	2	4	2	2	-1	+1	-2	0	-1
4	2	3	4	3	2	-1	+1	-2	+1	-1
5	2	3	5	4	3	-2	+1	-2	+2	-1

Note: Submarines cannot be targets

ATW ATTACK TABLE

Sub Def. Type	ATW TYPE				Damage Factor Modifications			
	HH	Squid			SUBMARINE DEPTH			
		S1	S2	S3	0-150	175-225	250-300	325-400
1	5	4	5	7	0	-1	-2	-2
2	6	5	6	8	0	0	-1	-1
3	7	6	7	9	0	0	0	-1

SONAR SEARCH TABLE

Escort Speed	Range (hexes)		Die Roll Modifications		
	0-15	0-30	Initial Echo	Japanese Sonar	Improved Sonar
0	5	4	+1	+1	-1
1	4	3	+1	+1	-1
2	3	2	+1	+1	-1
3-4	2	1	+1	+1	-1

SURFACE GUNNERY TABLE

Gunnery Strength	Range (hexes)					Damage Factor Modifications				NIGHT ACTION *			
	0-10	11-15	16-20	21-30	31-40	TARGET DEFENSE TYPE				Radar only	Star Shell		
						All Subs	1-2	3-4	5		Same hex	Adj. hex	None
1-2	2	3	2	1	0	0	0	0	+2	-2	0	-1	-2
3-5	3	4	3	2	1	0	0	0	+1	-2	0	-1	-2
6-9	3	4	4	3	2	0	0	0	0	-2	0	-1	-2
10-13	4	5	5	4	3	-1	-1	0	0	-2	0	-1	-2
14+	5	6	6	5	4	-2	-1	-1	0	-2	0	-1	-2

Maximum range: 40 hexes

* Use only the worst modifier (The General, 15-4)

RADAR SEARCH TABLE

Die Roll	Die Roll Mods			
	0 ft.	25 ft.	10cm Radar	3cm Radar
1	C	C	-1	-2
2	C	C	-1	-2
3	C	-	-1	-2
4	C	-	-1	-2
5	-	-	-1	-2
6	-	-	-1	-2

BASIC SUB DATA - GERMANY

ID	Class	Def. Type	Speed			Damage		Dive Rate	Rise Rate	Max Depth	Gunnery			Emer. Power	Torp. Tubes		Reloads		VP	Avail.
			Max. Surf.	Norm. Sub.	Max Sub.	Surf.	Sink				Fwd	Bde	Aft		Bow	Stern	Bow	Stern		
G5	VII B	1	3	1	3	2	4	50	25	600	1	1	-	5	4	1	8	1	23	F '39
G6	IX B	2	3	1	3	3	5	50	25	600	2	2	-	6	4	2	8	2	35	F '39
G7	VII C	1	3	1	3	2	4	50	25	750	1	1	-	5	4	1	8	1	26	F '40
G8	IX C	2	3	1	3	3	5	50	25	600	2	2	-	6	4	2	8	2	37	F '40
G9	IX D2	2	3	1	3	3	5	50	25	600	2	2	-	6	4	2	8	2	39	W '42
G10	XXI	2	2	2	3	3	7	75	50	1000	-	-	-	10	6	-	18	-	41	Sp '45
G11	XXIII	1	2	2	3	2	3	75	50	500	-	-	-	10	2	-	-	-	15	Sp '45

TORPEDOES

Type	Speed	Damage Factor	Propellant	Avail.	Notes
G7A	8	10	Steam	F '39	
G7E	5	11	Electric	S '40	
G7E (Mag)	5	11	Electric	W '43	Magnetic
T5	5	11	Electric	F '43	Acoustic

BASIC SUB DATA - JAPAN

ID	Class	Def. Type	Speed			Damage		Dive Rate	Rise Rate	Max Depth	Gunnery			Emer. Power	Torp. Tubes		Reloads		VP	Avail.
			Max. Surf.	Norm. Sub.	Max Sub.	Surf.	Sink				Fwd	Bde	Aft		Bow	Stern	Bow	Stern		
J12	RO-60	2	3	1	3	2	4	50	25	200	1	1	-	4	6	-	4	-	25	W '42
J13	I-153	3	3	1	3	4	7	50	25	200	2	2	-	5	8	-	8	-	35	W '42
J14	I-168	3	4	1	2	4	8	25	25	250	2	2	-	5	6	-	8	-	39	W '42
J15	RO-33	2	3	1	3	2	4	50	25	250	1	1	-	3	4	-	6	-	26	W '42
J16	I-15	3	4	1	2	4	8	25	25	325	3	3	-	4	8	-	12	-	40	W '42
J17	I-16	3	4	1	2	4	8	50	25	325	3	3	-	4	6	-	11	-	42	W '42
J18	RO-100	1	2	1	2	2	3	50	25	250	1	1	-	3	4	-	4	-	13	S '42
J19	RO-35	2	3	1	2	3	5	50	25	250	1	1	-	3	4	-	6	-	27	S '42
J20	I-400	3	3	1	2	5	10	25	25	325	-	3	3	5	8	-	12	-	50	S '44
J21	HA-201	1	2	2	3	2	3	50	25	350	-	-	-	10	2	-	2	-	17	S '45
J22	I-201	2	2	2	3	3	6	50	25	375	-	-	-	10	4	-	6	-	38	S '45

TORPEDOES

Type	Speed	Damage Factor	Propellant	Avail.
T95 Mod 1	9	11	Oxygen	W '42
T92 Mod 1	5	9	Electric	W '42
T95 Mod 2	9	11	Oxygen	W '43

BASIC SUB DATA - ITALY, FRANCE, RUSSIA

	ID	Class	Def. Type	Speed			Damage		Dive Rate	Rise Rate	Max Depth	Gunnery			Emer. Power	Torp. Tubes		Reloads		VP	Avail.
				Max. Surf.	Norm. Sub.	Max Sub.	Surf.	Sink				Fwd	Bde	Aft		Bow	Stern	Bow	Stern		
Italy	I4	Brin	2	3	1	2	2	4	50	25	375	1	1	-	4	6	2	6	2	24	Sp '40
	I5	Calvi	2	3	1	2	3	5	50	25	350	2	2	-	4	4	4	4	4	31	Sp '40
	I6	Adua	2	3	1	2	2	4	50	25	375	1	1	-	4	4	4	4	-	34	Sp '40
	I7	Marconi	1	2	1	2	2	3	50	25	375	1	1	-	4	4	2	4	2	20	Sp '40
	I8	Cagni	2	3	1	2	3	6	50	25	400	1	2	1	4	8	6	16	6	37	Sp '41
France	F1	Requin	2	3	1	2	3	5	50	25	275	1	1	-	4	4	2	4	2	34	F '39
	F2	Redoutable	3	3	1	3	3	6	50	25	275	1	1	-	4	4	-	4	-	38	F '39
	F3	Surcouf	3	3	2	3	5	9	25	25	400	11	11	-	5	4	4	6	4	48	F '39
	F4	L'Aurore	1	2	1	2	2	4	50	25	350	1	1	-	4	4	-	4	-	20	F '39
Russia	R3	"Shch"	1	2	1	2	2	3	50	25	300	-	-	-	4	4	2	4	2	18	Sp '41
	R4	S	2	3	1	2	2	4	50	25	300	1	1	-	4	6	-	6	-	28	Sp '41
	R5	Katyusha	3	3	1	2	4	8	50	25	400	1	3	1	4	6	4	6	4	40	Sp '41

TORPEDOES

	Type	Speed	Damage Factor	Propellant	Avail.	Notes
Italy	W.21	8	9	Steam	Sp '40	
	W.17.7	8	8	Steam	Sp '40	
France	24V	8	10	Steam	F '39	
	15.7	8	7	Steam	F '39	Max. range 15 hexes
Russia	21”	8	11	Steam	Sp '41	

BASIC SUB DATA - AMERICA

ID	Class	Def. Type	Speed			Damage			Gunnery					Torp. Tubes		Reloads		VP	Avail.	
			Max. Surf.	Norm. Sub.	Max Sub.	Surf.	Sink	Dive Rate	Rise Rate	Max Depth	Fwd	Bde	Aft	Emer. Power	Bow	Stern	Bow			Stern
A13	Old S	1	2	1	3	2	4	50	25	250	1	1	-	4	4	-	8	-	28	W '42
A14	New S	2	3	2	3	3	6	50	25	300	1	1	-	5	4	4	8	8	33	W '42
A15	T	2	3	2	3	3	6	50	25	300	1	1	-	5	6	4	10	4	40	W '42
A16	Gato	2	3	2	3	3	7	50	25	375	1	1	-	5	6	4	10	4	46	S '42
A17	Tench	2	3	2	3	4	8	50	25	600	-	2	2	5	6	4	10	4	50	W '45

TORPEDOES

Type	Speed	Damage Factor	Propellant	Avail.	Notes
Mk 10	6	9	Steam	W '42	
Mk 14 (Mag)*	8	10	Steam	W '42	Magnetic
Mk 14	8	10	Steam	F '43	
Mk 18	5	10	Electric	F '43	
Mk 18A	5	10	Electric	W '45	Acoustic

* Added Mk 14 (Mag) as a distinct torpedo type

BASIC SUB DATA - BRITAIN

ID	Class	Def. Type	Speed			Damage		Dive Rate	Rise Rate	Max Depth	Gunnery			Emer. Power	Torp. Tubes		Reloads		VP	Avail.
			Max. Surf.	Norm. Sub.	Max Sub.	Surf.	Sink				Fwd	Bde	Aft		Bow	Stern	Bow	Stern		
B21	S Type 1	1	3	1	3	2	4	50	25	200	1	1	-	3	6	-	6	-	25	F '39
B22	T Type 1	2	3	1	2	3	6	50	25	200	2	2	-	4	6	-	6	-	34	F '39
B23	U	1	3	1	3	2	4	50	25	200	1	1	-	5	4	-	4	-	23	F '39
B24	S Type 2	1	3	2	3	2	4	50	25	250	2	2	-	3	6	-	6	-	29	F '41
B25	T Type 2	2	3	1	2	3	6	50	25	350	2	2	-	4	6	-	6	-	38	Sp '42
B26	V	1	3	1	3	2	4	50	25	300	1	1	-	5	4	-	4	-	26	S '43

TORPEDOES

Type	Speed	Damage Factor	Propellant	Avail.
Mk VIII	8	10	Steam	F '39

BASIC SHIP DATA - GERMANY

ID	Type	Class	Def. Type	Speed	Damage	ASW			Gunnery			VP	Avail
						ATW	K-Gun	DC	Fwd	Bde	Aft		
G1	ML	R17	2	3	1	-	-	4	-	-	-	1	F '39
G2	DD	Z	1	6	10	-	-	4	5	10	6	14	F '39
G3	E	F	1	5	3	-	-	4	2	4	2	4	F '39
G4	ML	R151	2	3	1	-	-	4	-	-	-	1	Sp '40

CAPITAL SHIPS

C11	BC	Gneisenau	4	5	53	-	-	-	18	32	14	53	F '39
C12	PBB	Admiral Scheer	4	5	21	-	-	-	14	28	14	21	F '39
C13	CA	Prinz Eugen	4	5	22	-	-	-	12	24	12	22	W '41

MERCHANT SHIPS

Class	Def. Type	Damage	VP
C2 General Cargo	5	5	8
C3 General Cargo	5	7	12
T2 Tanker	5	8	27
T3 Super Tanker	5	10	32

BASIC SHIP DATA - JAPAN

ID	Type	Class	Def. Type	Speed	Damage	ASW			Gunnery			VP	Avail	Notes
						ATW	K-Gun	DC	Fwd	Bde	Aft			
J1	DD	Akatsuki	1	6	8	-	1	5	4	13	8	9	W '42	
J2	DD	Hatsuharu	1	6	7	-	1	5	3	10	6	9	W '42	
J3	DD	Kamikaze	1	6	5	-	1	5	2	5	2	7	W '42	
J4	SC	Sub Chaser #1	2	3	1	-	-	6	1	1	1	3	W '42	
J5	DD	Shimikaze	1	6	10	-	1	5	4	13	8	12	F '42	
J6	E	Etorufu	2	3	4	-	1	6	1	4	3	4	W '43	
J7	SC	Sub Chaser #28	2	3	2	-	-	6	1	1	1	3	F '43	
J8	E	Kaibokan I	2	3	3	-	3	3	1	2	1	3	Sp '44	
J9	E	Kaibokan II	2	3	3	-	3	3	1	2	1	3	Sp '44	
J10	E	Ukuru B	2	3	4	-	-	6	1	4	3	4	Sp '44	
J11	DD	Matsu	1	5	5	-	1	5	2	5	3	5	Sp '44	

CAPITAL SHIPS

C14	BB	Yamato	4	5	90	-	-	-	20	40	20	90	Sp '42*	* Errata, General 15-5
C15	CV	Shokaku	4	6	36	-	-	-	13	26	13	72	W '41	
C16	CL	Mogami	4	6	19	-	-	-	13	26	13	19	W '41	

MERCHANT SHIPS

Class	Def. Type	Damage	VP
C2 General Cargo	5	5	8
C3 General Cargo	5	7	12
T2 Tanker	5	8	27
T3 Super Tanker	5	10	32

BASIC SHIP DATA - ITALY, FRANCE, RUSSIA

	ID	Type	Class	Def. Type	Speed	Damage	ASW			Gunnery			VP	Avail
							ATW	K-Gun	DC	Fwd	Bde	Aft		
Italy	I1	TB	Spica	1	6	4	-	2	4	1	3	2	6	Sp '40
	I2	DE	Animoso	1	5	7	-	2	4	1	2	1	7	S '42
	I3	C	Gabbiano	2	3	3	-	2	4	1	1	-	3	F '42
Russia	R1	DD	7	1	6	9	-	1	4	4	8	4	10	Sp '41
	R2	SC	BO-2	2	3	1	-	-	6	-	-	-	1	S '41

MERCHANT SHIPS

Class	Def. Type	Damage	VP
C2 General Cargo	5	5	8
C3 General Cargo	5	7	12
T2 Tanker	5	8	27
T3 Super Tanker	5	10	32

BASIC SHIP DATA - AMERICA

ID	Type	Class	Def. Type	Speed	Damage	ASW			Gunnery			VP	Avail	Notes
						ATW	K-Gun	DC	Fwd	Bde	Aft			
A1	DD	Flush Deck	1	6	5	-	1	5	2	6	3	8	F '41	
A2	DD	Craven	1	6	6	-	1	5	5	11	5	9	W '42	
A3	DD	Benson	1	6	7	-	1	5	5	11	5	12	W '42	
A4	SC	Sub Chaser #1	2	3	3	-	-	2	1	1	-	3	W '42	
A5	SC	Sub Chaser #2	2	3	1	-	-	2	1	3	1	3	W '42	
A6	DD	Fletcher	1	6	9	-	1	5	6	13	6	9	Sp '42	
A7	DE	Evarts	2	3	5	H	2	5	2	4	1	6	F '42	
A8	DE	Buckly	1	4	6	H	2	6	5	8	2	7	W '43	
A9	DE	Cannon	2	3	5	H	2	5	5	8	2	7	Sp '43	
A10	DE	Edsall	2	3	5	H*	2	5	2	4	1	7	Sp '43	* 2H from W '44 on (Errata, General 15-5)
A11	PF	Frigate	2	3	6	-	2	4	3	5	2	8	S '43	
A12	DD	Sumner	1	6	10	-	1	5	8	13	4	12	W '44	

CAPITAL SHIPS

C7	BB	Iowa	4	5	69	-	-	-	18	36	18	69	W '43	
C8	BB	North Carolina	4	5	54	-	-	-	18	36	18	54	W '42*	* Errata, General 15-5
C9	CV	Enterprise	4	6	32	-	-	-	10	10	10	64	W '42*	* Errata, General 15-5
C10	CA	Indianapolis	4	5	16	-	-	-	15	24	9	16	W '42*	* Errata, General 15-5

MERCHANT SHIPS

Class	Def. Type	Damage	VP
C2 General Cargo	5	5	8
C3 General Cargo	5	7	12
T2 Tanker	5	8	27
T3 Super Tanker	5	10	32
EC2 Liberty	5	6	8
VC2 Victory	5	6	9

BASIC SHIP DATA - BRITAIN

ID	Type	Class	Def. Type	Speed	Damage	ASW			Gunnery			VP	Avail	Notes
						ATW	K-Gun	DC	Fwd	Bde	Aft			
B1	DD	V Type 1	1	6	6	H	1	5	1	2	1	10	F '39	
B2	DD	V Type 2	1	5	6	H	1	4	2	4	2	10	F '39	
B3	DD	W	1	5	6	H	1	4	2	4	2	10	F '39	
B4	DD	Town	1	6	5	H	1	7	1	4	2	8	F '39	
B5	DD	A	1	6	7	H	-	5	3	6	3	10	F '39	
B6	DD	I	1	6	7	H	-	5	3	6	3	10	F '39	
B7	DD	J	1	6	8	-	-	5	6	9	3	9	F '39	
B8	DD	M	1	6	9	-	-	5	6	9	3	9	F '39	
B9	DD	Tribal	1	6	9	-	1	4	3	13	9	12	F '39	
B10	S	Black Swan	2	3	7	H	1	5	5	7	2	7	F '39	
B11	DE	Hunt	1	4	4	H	1	5	2	4	2	4	F '39	
B12	S	Bittern	2	3	7	H	1	5	4	8	4	7	F '39	
B13	DE	Havant	1	6	7	H	1	5	3	6	3	8	W '40	
B14	C	Flower	2	3	4	H	1	5	1	1	-	5	W '41	
B15	DD	O	1	6	7	-	1	4	3	6	3	7	S '41	
B16	DD	Q	1	6	8	-	1	5	3	6	3	8	F '41	
B17	F	Captain	2	3	5	H	1	5	2	3	1	6	S '42	
B18	F	River	2	3	6	H	1	5	1	2	1	6	Sp '43	
B19	F	Loch	2	3	7	S	1	5	1	1	-	7	S '44	
B20	DD	Battle	1	6	10	H / S*	1	5	8	8	-	12	Sp '45	*Equip with either Hedgehog or Squid

MERCHANT SHIPS

Class	Def. Type	Damage	VP
C2 General Cargo	5	5	8
C3 General Cargo	5	7	12
T2 Tanker	5	8	27
T3 Super Tanker	5	10	32
EC2 Liberty	5	6	8
VC2 Victory	5	6	9

CAPITAL SHIPS

C1	BB	Barham	5	4	44	-	-	-	16	34	16	44	F '39	
C2	BB	Royal Oak	5	4	42	-	-	-	16	34	16	42	F '39	
C3	BB	King George V	4	5	57	-	-	-	14	28	14	57	F '39	
C4	CV	Ark Royal	4	5	33	-	-	-	11	11	11	56	F '39	
C5	CL	Ajax	4	5	10	-	-	-	12	24	12	13	F '39	
C6	CVE	Avenger	5	3	12	-	-	-	2	2	2	20	W '41	

ADVANCED SUB DATA - GERMANY

ID	Class	Def. Type	Speed					Damage		Dive Rate	Rise Rate	Max Depth	Gunnery			Emer. Power	Torp. Tubes		Reloads		VP	Avail.	Notes
			Max. Surf.	Norm. Sub.	Max Sub.	Silent Rng.	Snort	Surf.	Sink				Fwd	Bde	Aft		Bow	Stern	Bow	Stern			
G5	VIIB	1	5	1	2	1/2	-	2	4	100	50	600	1	1	-	60	4	1	8	1	23	F '39	
G6	IXB	2	5	1	2	1/2	-	3	5	100	50	600	2	2	-	60	4	2	8	2	35	F '39	
G7	VIIC	1	5	1	2	1/2	2	2	4	100	50	750	1	1	-	60	4	1	8	1	26	F '40	
G8	IXC	2	5	1	2	1/2	2	3	5	100	50	600	2	2	-	60	4	2	8	2	37	F '40	
G9	IXD2	2	5	1	2	1/2	2	3	5	100	50	600	2	2	-	60	4	2	8	2	39	W '42	
G10	XXI	2	4	3	5	3/2	2	4	7	175	100	1000	-	-	-	120	6	-	18	-	41	Sp '45	Must use T3 torpedo. Reload rate: 2 turns. Uses "S" gear.
G11	XXIII	0	3	2	4	3/2	3	2	3	175	100	500	-	-	-	120	2	-	-	-	15	Sp '45	Must use T3 torpedo. Uses "S" gear.
G12	IID	1	4	1	2	1/2	2	1	2	100	50	600	-	-	-	60	3	-	3	-	23	F '40	From General 19-6

TORPEDOES

Type	Speed	Propellant	Avail.	Notes
G7A	12	Steam	F '39	
G7E	8	Electric	S '40	
FAT	8	Electric	W '43	Circling
G7E (Mag)	8	Electric	W '43	Magnetic
T5	7	Electric	F '43	Acoustic
T3	7	Electric	Sp '45	Acoustic, Circling

SUBMARINE VISUAL RANGE (HEXES)

Conditions	Surface	25 ft. (periscope depth)	50-150 ft., Using "S" gear
	Unlimited	35	30
Sunny Day	Unlimited	35	30
Cloudy Day	Unlimited	25	30
Moonlit Night / Dusk	40	25	30
Dark Night	25	12	30

ADVANCED SUB DATA - JAPAN

ID	Class	Def. Type	Speed					Damage			Gunnery					Emer. Power	Torp. Tubes		Reloads		VP	Avail.
			Max. Surf.	Norm. Sub.	Max Sub.	Silent Rng.	Snort	Surf.	Sink	Dive Rate	Rise Rate	Max Depth	Fwd	Bde	Aft		Bow	Stern	Bow	Stern		
J12	RO-60	2	5	1	2	1/2	-	2	4	100	50	200	1	1	-	60	6	-	4	-	25	W '42
J13	I-153	3	6	1	2	1/2	-	4	7	75	50	200	2	2	-	60	8	-	8	-	35	W '42
J14	I-168	4	7	1	2	1/2	-	4	8	50	25	250	2	2	-	60	6	-	8	-	39	W '42
J15	RO-33	2	6	1	2	1/2	-	2	4	100	50	250	1	1	-	60	4	-	6	-	26	W '42
J16	I-15	4	7	1	2	1/2	-	4	8	50	25	325	3	3	-	60	8	-	12	-	40	W '42
J17	I-16	4	7	1	2	1/2	-	4	8	75	50	325	3	3	-	60	6	-	11	-	42	W '42
J18	RO-100	1	4	1	2	1/2	-	2	3	100	50	250	1	1	-	60	4	-	4	-	13	S '42
J19	RO-35	2	6	1	2	1/2	-	3	5	100	50	250	1	1	-	60	4	-	6	-	27	S '42
J20	I-400	5	5	1	2	1/2	1	5	10	50	25	325	-	3	3	60	8	-	12	-	50	S '44
J21	HA-201	1	3	2	4	1	1	2	3	150	75	350	-	-	-	120	2	-	2	-	17	S '45
J22	I-201	2	4	2	5	1	1	3	6	150	75	375	-	-	-	120	4	-	6	-	38	S '45

TORPEDOES

Type	Speed	Propellant	Avail.
T95 Mod 1	14	Oxygen	W '42
T92 Mod 1	8	Electric	W '42
T95 Mod 2	14	Oxygen	W '43

SUBMARINE VISUAL RANGE (HEXES)

Conditions	25 ft. Surface (periscope depth)	
	Unlimited	35
Sunny Day	Unlimited	25
Cloudy Day	40	25
Moonlit Night / Dusk	25	12
Dark Night		

ADVANCED SUB DATA - ITALY, FRANCE, RUSSIA

	ID	Class	Def. Type	Speed				Damage		Dive Rate	Rise Rate	Max Depth	Gunnery			Emer. Power	Torp. Tubes		Reloads		VP	Avail.	Notes	
				Max. Surf.	Norm. Sub.	Max Sub.	Silent Rng.	Snort	Surf.				Sink	Fwd	Bde		Aft	Bow	Stern	Bow				Stern
Italy	I4	Brin	2	5	1	2	1/2	-	2	4	75	50	375	1	1	-	60	6	2	6	2	24	Sp '40	
	I5	Calvi	2	5	1	2	1/2	-	3	5	75	50	350	2	2	-	60	4	4	4	4	31	Sp '40	
	I6	Adua	2	5	1	2	1/2	-	2	4	75	50	375	1	1	-	60	4	4	4	-	34	Sp '40	
	I7	Marconi	1	4	1	2	1/2	-	2	3	100	50	375	1	1	-	60	4	2	4	2	20	Sp '40	
	I8	Cagni	2	5	1	2	1/2	-	3	6	100	50	400	1	2	1	60	8	6	16	6	37	Sp '41	Must use W.17.7 torpedo
France	F1	Requin	2	5	1	3	1/2	-	3	5	100	50	275	1	1	-	60	4	2	4	2	34	F '39	External tubes: 4 (may be fired FWD or AFT)
	F2	Redoutable	3	5	1	3	1/2	-	3	6	75	50	275	1	1	-	60	4	-	4	-	38	F '39	Must use 15.7 torpedo. External tubes: 5 bow, 2 stern
	F3	Surcouf	4	5	2	3	1/2	-	5	9	50	50	400	11	11	-	60	4	4	6	4	48	F '39	Stern tubes must use 15.7 torpedo. External tubes: 4 stern
	F4	L'Aurore	1	4	1	3	1/2	-	2	4	100	50	350	1	1	-	60	4	-	4	-	20	F '39	External tubes: 3 bow, 2 stern
Russia	R3	"Shch"	1	4	1	2	1/2	-	2	3	100	50	300	-	-	-	60	4	2	4	2	18	Sp '41	
	R4	S	2	6	1	2	1/2	-	2	4	75	50	300	1	1	-	60	6	-	6	-	28	Sp '41	
	R5	Katyusha	3	6	1	2	1/2	-	4	8	50	50	400	1	3	1	60	6	4	6	4	40	Sp '41	
	R6	Amerikanski Golland	1	4	1	2	1/2	-	1	2	100	50	300	-	-	-	60	4	-	4	-	18	Sp '41	From General 19-6
	R7	Leninets	2	5	1	2	1/2	-	2	4	75	50	300	1	1	-	60	6	2	6	-	28	Sp '41	From General 19-6

TORPEDOES

	Type	Speed	Propellant	Avail.	Notes
Italy	W.21	13	Steam	Sp '40	
	W.17.7	12	Steam	Sp '40	
France	24V	13	Steam	F '39	
	15.7	13	Steam	F '39	Max. range 15 hexes
Russia	21"	12	Steam	Sp '41	

SUBMARINE VISUAL RANGE (HEXES)

Conditions	Surface	25 ft. (periscope depth)
Sunny Day	Unlimited	35
Cloudy Day	Unlimited	25
Moonlit Night / Dusk	40	25
Dark Night	25	12

ADVANCED SUB DATA - AMERICA

ID	Class	Def. Type	Speed					Damage			Gunnery					Torp. Tubes		Reloads		VP	Avail.	Notes	
			Max. Surf.	Norm. Sub.	Max Sub.	Silent Rng.	Snort	Surf.	Sink	Dive Rate	Rise Rate	Max Depth	Fwd	Bde	Aft	Emer. Power	Bow	Stern	Bow				Stern
A13	Old S	1	4	1	3	1/2	-	2	4	100	50	250	1	1	-	60	4	-	8	-	28	W '42	Must use Mk10 torpedo
A14	New S	3	6	1	3	1/2	-	3	6	100	50	300	1	1	-	60	4	4	8	8	33	W '42	
A15	T	3	6	1	3	1/2	-	3	6	100	50	300	1	1	-	60	6	4	10	4	40	W '42	
A16	Gato	3	6	1	3	1/2	-	4	7	100	50	375	1	1	-	60	6	4	10	4	46	S '42	
A17	Tench	3	6	1	3	1/2	-	4	8	100	50	600	-	2	2	60	6	4	10	4	50	W '45	

TORPEDOES

Type	Speed	Propellant	Avail.	Notes
Mk 10	10	Steam	W '42	
Mk 14 (Mag)*	13	Steam	W '42	Magnetic
Mk 14	13	Steam	F '43	
Mk 18	8	Electric	F '43	
Mk 18A	8	Electric	W '45	Acoustic

* Added Mk 14 (Mag) as a distinct torpedo type

SUBMARINE VISUAL RANGE (HEXES)

Conditions	25 ft. Surface (periscope depth)	
	Surface	25 ft.
Sunny Day	Unlimited	35
Cloudy Day	Unlimited	25
Moonlit Night / Dusk	40	25
Dark Night	25	12

ADVANCED SUB DATA - BRITAIN

ID	Class	Def. Type	Speed					Damage		Dive Rate	Rise Rate	Max Depth	Gunnery			Emer. Power	Torp. Tubes		Reloads		VP	Avail.	Notes
			Max. Surf.	Norm. Sub.	Max Sub.	Silent Rng.	Snort	Surf.	Sink				Fwd	Bde	Aft		Bow	Stern	Bow	Stern			
B21	S Type 1	1	4	1	3	1/2	-	2	4	100	50	200	1	1	-	60	6	-	6	-	25	F '39	
B22	T Type 1	2	4	1	2	1/2	-	3	6	100	50	200	2	2	-	60	6	-	6	-	34	F '39	External tubes: 2 bow, 2 stern
B23	U	1	3	1	2	1/2	-	2	4	100	50	200	1	1	-	60	4	-	4	-	23	F '39	External tubes: 2 bow
B24	S Type 2	1	4	1	2	1/2	-	2	4	100	50	250	2	2	-	60	6	-	6	-	29	F '41	
B25	T Type 2	2	4	1	2	1/2	-	3	6	100	50	350	2	2	-	60	6	-	6	-	38	Sp '42	External tubes: 4 bow, 1 stern
B26	V	1	4	1	2	1/2	-	2	4	100	50	300	1	1	-	60	4	-	4	-	26	S '43	

TORPEDOES

Type	Speed	Propellant	Avail.
Mk VIII	12	Steam	F '39

SUBMARINE VISUAL RANGE (HEXES)

Conditions	25 ft. Surface (periscope depth)	
	Unlimited	35
Sunny Day	Unlimited	25
Cloudy Day	40	25
Moonlit Night / Dusk	25	12
Dark Night		

ADVANCED SHIP DATA - GERMANY

ID	Type	Class	Def. Type	Speed	Damage	ASW			Gunnery			VP	Avail	Notes
						ATW	K-Gun	DC	Fwd	Bde	Aft			
G1	ML	R17	2	6	1	-	-	4	-	-	-	1	F '39	
G2	DD	Z	1	11	10	-	-	4	5	10	6	14	F '39	
G3	E	F	1	8	3	-	-	4	2	4	2	4	F '39	
G4	ML	R151	2	6	1	-	-	4	-	-	-	1	Sp '40	

CAPITAL SHIPS

C11	BC	Gneisenau	4	9	53	-	-	-	33	50	17	53	F '39	
C12	PBB	Admiral Scheer	4	8	21	-	-	-	17	34	17	21	F '39	
C13	CA	Prinz Eugen	4	9	22	-	-	-	16	32	16	22	W '41	
C21	BB	Tirpitz	4	9	63	-	-	-	31	63	31	63	F '41	From General 19-6. Use the Torpedo Detonation values of Gneisenau and subtract one from the white die.
C22	CL	Leipzig / Koln	4	9	10	-	-	-	10	26	16	10	F '39	From General 23-3
C23	CL	Nurnberg	4	9	11	-	-	-	10	26	16	11	F '39	From General 23-3

MERCHANT SHIPS

Class	Def. Type	Damage	VP
C2 General Cargo	5	5	8
C3 General Cargo	5	7	12
T2 Tanker	5	8	27
T3 Super Tanker	5	10	32

ADVANCED SHIP DATA - JAPAN

ID	Type	Class	Def. Type	Speed	Damage	ASW			Gunnery			VP	Avail	Notes
						ATW	K-Gun	DC	Fwd	Bde	Aft			
J1	DD	Akatsuki	1	11	8	-	1	5	4	13	8	9	W '42	
J2	DD	Hatsuharu	1	10	7	-	1	5	3	10	6	9	W '42	
J3	DD	Kamikaze	1	10	5	-	1	5	2	5	2	7	W '42	
J4	SC	Sub Chaser #1	2	6	1	-	-	6	1	1	1	3	W '42	
J5	DD	Shimikaze	1	12	10	-	1	5	4	13	8	12	F '42	
J6	E	Etorufu	2	6	4	-	1	6	1	4	3	4	W '43	
J7	SC	Sub Chaser #28	2	5	2	-	-	6	1	1	1	3	F '43	
J8	E	Kaibokan I	2	5	3	-	3	3	1	2	1	3	Sp '44	
J9	E	Kaibokan II	2	5	3	-	3	3	1	2	1	3	Sp '44	
J10	E	Ukuru B	2	6	4	-	-	6	1	4	3	4	Sp '44	
J11	DD	Matsu	1	8	5	-	1	5	2	5	3	5	Sp '44	

CAPITAL SHIPS

C14	BB	Yamato	4	8	90	-	-	-	54	81	27	90	Sp '42*	* Errata, General 15-5
C15	CV	Shokaku	4	10	36	-	-	-	20	20	20	72	W '41	
C16	CL	Mogami	4	10	19	-	-	-	24	40	16	19	W '41	
C17	CA	Kako	4	6	18	-	-	-	13	26	13	13	W '41	From General 18-6
C18	CVE	Taiyo	4	6	40	-	-	-	10	20	10	40	W '41	From General 18-6
C19	CV	Unryu	4	6	40	-	-	-	15	20	10	40	Sp '44	From General 18-6
C20	CL	Kuma	4	9	10	-	-	-	10	26	16	10	F '39	From General 18-6

MERCHANT SHIPS

Class	Def. Type	Damage	VP
C2 General Cargo	5	5	8
C3 General Cargo	5	7	12
T2 Tanker	5	8	27
T3 Super Tanker	5	10	32

ADVANCED SHIP DATA - ITALY, FRANCE, RUSSIA

	ID	Type	Class	Def. Type	Speed	Damage	ASW			Gunnery			VP	Avail
							ATW	K-Gun	DC	Fwd	Bde	Aft		
Russia	I1	TB	Spica	1	10	4	-	2	4	1	3	2	6	Sp '40
	I2	DE	Animoso	1	8	7	-	2	4	1	2	1	7	S '42
	I3	C	Gabbiano	2	5	3	-	2	4	1	1	-	3	F '42
Italy	R1	DD	7	1	10	9	-	1	4	4	8	4	10	Sp '41
	R2	SC	BO-2	2	6	1	-	-	6	-	-	-	1	S '41

MERCHANT SHIPS

Class	Def. Type	Damage	VP
C2 General Cargo	5	5	8
C3 General Cargo	5	7	12
T2 Tanker	5	8	27
T3 Super Tanker	5	10	32

ADVANCED SHIP DATA - AMERICA

ID	Type	Class	Def. Type	Speed	Damage	ASW			Gunnery			VP	Avail	Notes
						ATW	K-Gun	DC	Fwd	Bde	Aft			
A1	DD	Flush Deck	1	10	5	-	1	5	2	6	3	8	F '41	
A2	DD	Craven	1	10	6	-	1	5	3	7	3	9	W '42	
A3	DD	Benson	1	10	7	-	1	5	4	10	5	12	W '42	
A4	SC	Sub Chaser #1	2	5	3	-	-	2	1	2	1	3	W '42	
A5	SC	Sub Chaser #2	2	6	1	-	-	2	1	1	-	3	W '42	
A6	DD	Fletcher	1	10	9	-	1	5	4	10	5	9	Sp '42	
A7	DE	Evarts	2	6	5	H	2	5	2	4	1	6	F '42	
A8	DE	Buckly	1	7	6	H	2	6	2	4	1	7	W '43	
A9	DE	Cannon	2	6	5	H	2	5	2	4	1	7	Sp '43	
A10	DE	Edsall	2	6	5	H*	2	5	2	4	1	7	Sp '43	* 2H from W '44 on (Errata, General 15-5)
A11	PF	Frigate	2	6	6	-	2	4	1	3	2	8	S '43	
A12	DD	Sumner	1	10	10	-	1	5	8	13	4	12	W '44	

CAPITAL SHIPS

C7	BB	Iowa	4	9	69	-	-	-	48	72	24	69	W '43	
C8	BB	North Carolina	4	8	54	-	-	-	48	72	24	54	W '42*	* Errata, General 15-5
C9	CV	Enterprise	4	10	32	-	-	-	10	10	10	64	W '42*	* Errata, General 15-5
C10	CA	Indianapolis	4	9	16	-	-	-	24	36	12	16	W '42*	* Errata, General 15-5

MERCHANT SHIPS

Class	Def. Type	Damage	VP
C2 General Cargo	5	5	8
C3 General Cargo	5	7	12
T2 Tanker	5	8	27
T3 Super Tanker	5	10	32
EC2 Liberty	5	6	8
VC2 Victory	5	6	9

ADVANCED SHIP DATA - BRITAIN

ID	Type	Class	Def. Type	Speed	Damage	ASW			Gunnery			VP	Avail	Notes
						ATW	K-Gun	DC	Fwd	Bde	Aft			
B1	DD	V Type 1	1	10	6	H	1	5	1	2	1	10	F '39	
B2	DD	V Type 2	1	7	6	H	1	5	2	4	2	10	F '39	
B3	DD	W	1	7	6	H	1	5	2	4	2	10	F '39	
B4	DD	Town	1	9	5	H	1	6	1	4	2	8	F '39	
B5	DD	A	1	10	7	H	-	5	3	6	3	10	F '39	
B6	DD	I	1	10	7	H	-	5	3	6	3	10	F '39	
B7	DD	J	1	10	8	-	-	5	6	9	3	9	F '39	
B8	DD	M	1	10	9	-	-	5	6	9	3	9	F '39	
B9	DD	Tribal	1	10	9	-	1	4	3	13	9	12	F '39	
B10	S	Black Swan	2	6	7	H	1	5	5	7	2	7	F '39	
B11	DE	Hunt	1	7	4	H	1	5	2	4	2	4	F '39	
B12	S	Bittern	2	6	7	H	1	5	4	8	4	7	F '39	
B13	DE	Havant	1	9	7	H	1	5	3	6	3	8	W '40	
B14	C	Flower	2	5	4	H	1	5	1	1	-	5	W '41	
B15	DD	O	1	10	7	-	1	5	3	6	3	7	S '41	
B16	DD	Q	1	10	8	-	1	5	3	6	3	8	F '41	
B17	F	Captain	2	6	5	H	1	5	2	3	1	6	S '42	
B18	F	River	2	6	6	H	1	5	1	2	1	6	Sp '43	
B19	F	Loch	2	6	7	S	1	5	1	1	-	7	S '44	
B20	DD	Battle	1	10	10	H / S*	1	5	8	8	-	12	Sp '45	* Original table shows no ATW, but Basic Data table shows H / S.

MERCHANT SHIPS

Class	Def. Type	Damage	VP
C2 General Cargo	5	5	8
C3 General Cargo	5	7	12
T2 Tanker	5	8	27
T3 Super Tanker	5	10	32
EC2 Liberty	5	6	8
VC2 Victory	5	6	9

CAPITAL SHIPS

C1	BB	Barham	5	7	44	-	-	-	30	60	30	44	F '39	
C2	BB	Royal Oak	5	6	42	-	-	-	30	60	30	42	F '39	
C3	BB	King George V	4	8	57	-	-	-	42	70	28	57	F '39	
C4	CV	Ark Royal	4	9	33	-	-	-	9	9	9	56	F '39	
C5	CL	Ajax	4	9	10	-	-	-	12	24	12	13	F '39	
C6	CVE	Avenger	5	5	12	-	-	-	2	2	2	20	W '41	

WEAPON AVAILABILITY - GERMANY

	'39	1940				1941				1942				1943				1944				1945				Notes
	F	W	Sp	S	F	W	Sp	S	F	W	Sp	S	F	W	Sp	S	F	W	Sp	S	F	W	Sp	S		
300 lb. Depth Charge																										Max. depth 300 ft.
G7A Torpedo																										
G7E Torpedo																										
Sonar																										
Improved Sonar																										
FAT Torpedo																										Circling torpedo
G7E (Mag) Torpedo																										Magnetic torpedo
Radar																										
T5 Torpedo																										Acoustic torpedo
Schnorkel																										Enables use of diesel engines while submerged
T3 Torpedo																										Acoustic, Circling torpedo
“S” Gear																										XXI and XXIII subs only. Can fire torpedoes from up to 150 ft. deep.

RADAR AND SONAR FIT (24.1)

Die Roll	Ship Type		
	DD, Capital Ship*	DE, E, TB	C, PF, S, SC, ML
1	Fit	Fit	Fit
2	Fit	Fit	-
3	Fit	-	-
4 – 6	-	-	-

* Radar only

WEAPON AVAILABILITY - JAPAN

	1942				1943				1944				1945			Notes
	W	Sp	S	F	W	Sp	S	F	W	Sp	S	F	W	Sp	S	
250 lb. Depth Charge																Max. depth 250 ft.
Sonar																
T95 Mod 1 Torpedo																
T92 Mod 1 Torpedo																
T95 Mod 2 Torpedo																
10cm Radar																
Schnorkel *																Enables use of diesel engines while submerged

* Not included game charts, but included here because Class **HA 201** and **I 201** submarines list a “Snort” speed.

RADAR AND SONAR FIT (24.1)			
Die Roll	Ship Type		
	DD, Capital Ship*	DE, E, TB	C, PF, S, SC, ML
1	Fit	Fit	Fit
2	Fit	Fit	-
3	Fit	-	-
4 – 6	-	-	-

* Radar only

WEAPON AVAILABILITY - ITALY, FRANCE, RUSSIA

ITALY

	1940				1941				1942				1943				1944				1945			Notes
	Sp	S	F	W	Sp	S	F	W	Sp	S	F	W	Sp	S	F	W	Sp	S	F	W	Sp	S		
250 lb. Depth Charge																							Max. depth 150 ft.	
W.21 Torpedo																								
W.17.7 Torpedo																								
300 lb. Depth Charge																							Max. depth 300 ft.	
Sonar																								

FRANCE

	1940			1941			1942			1943			1944			1945			Notes
	Sp	S	F	W	Sp	S	F	W	Sp	S	F	W	Sp	S	F	W	Sp	S	
24V Torpedo																			
15.7 Torpedo																		Max. range 15 hexes	

RUSSIA

	1941				1942				1943				1944				1945				Notes
	Sp	S	F	W	Sp	S	F	W	Sp	S	F	W	Sp	S	F	W	Sp	S			
300 lb. Depth Charge																			Max. depth 300 ft.		
21" Torpedo																					

RADAR AND SONAR FIT (24.1)			
Die Roll	Ship Type		
	DD, Capital Ship*	DE, E, TB	C, PF, S, SC, ML
1	Fit	Fit	Fit
2	Fit	Fit	-
3	Fit	-	-
4 – 6	-	-	-
* Radar only			

WEAPON AVAILABILITY - AMERICA

	1942				1943				1944				1945			Notes
	W	Sp	S	F	W	Sp	S	F	W	Sp	S	F	W	Sp	S	
300 lb. Depth Charge																Max. depth 300 ft.
Sonar																
Radar																
Mk 10 Torpedo																
Mk 14 (Mag) Torpedo																Magnetic torpedo
600 lb. Depth Charge																Max. depth 550 ft. (750 ft. after Sp '43)
300 lb. Teardrop																Max. depth 550 ft. (750 ft. after Sp '43)
Improved Sonar																
10cm Radar																
Hedgehog																
“Q” Attachment																Improves sonar depth detection
Mk 14 Torpedo																
Mk 18 Torpedo																
“Foxer”																Acoustic torpedo decoy
Squid																
Mk 18A Torpedo																Acoustic torpedo
3cm Radar																

RADAR AND SONAR FIT (24.1)			
Die Roll	Ship Type		
	DD, Capital Ship*	DE, E, TB	C, PF, S, SC, ML
1	Fit	Fit	Fit
2	Fit	Fit	-
3	Fit	-	-
4 – 6	-	-	-

* Radar only

WEAPON AVAILABILITY - BRITAIN

	'39	1940				1941				1942				1943				1944				1945				Notes
	F	W	Sp	S	F	W	Sp	S	F	W	Sp	S	F	W	Sp	S	F	W	Sp	S	F	W	Sp	S		
300 lb. Depth Charge																										Max. depth 300 ft.
ASDIC																										
Mk VIII Torpedo																										
Radar																										
600 lb. Depth Charge																										Max. depth 550 ft. (750 ft. after Sp '43)
Mk X (1 ton) Depth Charge																										Max. depth 550 ft. (750 ft. after Sp '43)
300 lb. Teardrop																										Max. depth 550 ft. (750 ft. after Sp '43)
Improved ASDIC																										
10cm Radar																										
Hedgehog																										
“Q” Attachment																										Improves sonar depth detection
“Foxer”																										Acoustic torpedo decoy
Squid																										
3cm Radar																										

RADAR AND SONAR FIT (24.1)

Die Roll	Ship Type		
	DD, Capital Ship*	DE, E, TB	C, PF, S, SC, ML
1	Fit	Fit	Fit
2	Fit	Fit	-
3	Fit	-	-
4 – 6	-	-	-

* Radar only

ADVANCED DATA - AXIS ML & MTB

From “War in the Shallow Seas”, *General 23-3*

	ID	Type	Class	Def. Type	Speed	Damage	Torp. Tubes	ASW			Gunnery *			VP	Avail
								ATW	K-Gun	DC	Fwd	Bde	Aft		
Germany	G1	ML	R17	2	6	1	-	-	-	4	-	-	-	1	F '39
	G4	ML	R151	2	8	1	-	-	-	4	-	-	-	1	Sp '40
	G12	MTB	S2	1	11	1	2	-	-	-	(1)	(1)	-	1	W '30
	G13	MTB	S7	1	11	1	2	-	-	-	(2)	(2)	-	1	F '34
	G14	MTB	S15	1	12	2	2	-	-	-	(2)	(4)	(2)	2	F '38
	G15	MTB	S26	1	12	2	2	-	-	-	(2)	(6)	(4)	2	F '40
	G16	MTB	S119	1	12	2	2	-	-	-	2(4)	2(6)	(2)	2	S '43
	G17	MTB	S193	1	13	2	2	-	-	4	2(2)	3(4)	2(2)	2	S '44
	G18	MTB	S218	1	13	2	4	-	-	4	3(4)	3(6)	3(4)	3	W '44
	G19	ML	R5	2	7	1	-	-	-	-	1(3)	1(4)	(2)	1	S '38
Japan	J23	MTB	T1	2	11	1	2	-	-	-	1 (2)	2(2)	2(2)	1	Sp '41
	J24	ML	T1 Var I	2	11	1	-	-	-	6	1(2)	2(2)	1(2)	1	Sp '41
	J25	MTB	T51	2	9	2	4	-	-	8	(3)	(3)	(1)	2	S '43
	J26	MTB	T14	1	10	2	2	-	-	-	(2)	(2)	-	1	S '44
	J27	ML	MG7	1	10	1	-	-	-	-	1(3)	2(5)	1(3)	1	W '40
	J28	ML	MG7 Var I	1	10	1	-	-	-	4	(3)	(3)	(3)	1	W '40
	J29	ML	Shinyo	1	9	1	-	-	-	-	-	-	-	-	F '44
Italy	I1	MTB	Spica	1	10	4	2	-	-	4	1(2)	2(4)	(2)	3	Sp '39
	I9	MTB	MAS 423	1	12	2	2	-	-	-	(1)	(1)	-	1	S '29
	I10	MTB	MAS 502	1	12	2	2	-	-	6	(2)	(2)	-	1	Sp '36
	I11	MTB	MAS 526	1	12	3	2	-	-	6	(2)	(2)	-	2	W '37
	I12	ML	MS 11	2	10	4	2	-	4	10	(4)	(4)	(2)	3	F '41
	I13	ML	MS 51	1	10	4	4	-	4	12	(4)	(4)	(2)	3	F '42
	I14	ML	VAS 201	2	5	5	2	-	4	20	(2)	(2)	-	3	Sp '42
	I15	ML	VAS 231	2	5	5	2	-	4	20	(4)	(4)	(2)	3	Sp '43

* Gunnery strengths in parentheses represent small caliber weaponry, effective only against ML, MTB, and Submarines

ADVANCED DATA - ALLIED ML & MTB

From "War in the Shallow Seas". *General 23-3*

	ID	Type	Class	Def. Type	Speed	Damage	Torp. Tubes	ASW			Gunnery *			VP	Avail
								ATW	K-Gun	DC	Fwd	Bde	Aft		
America	A18	MTB	Elco	1	12	2	4	-	2	-	(2)	(2)	-	2	Sp '40
	A19	MTB	Higgins	1	12	2	4	-	-	2	(2)	(2)	-	2	Sp '40
Britain	B27	MTB	BPB	1	9	1	2	-	-	-	(1)	(1)	(1)	1	W '35
	B28	MTB	Vosper I	1	12	2	2	-	-	-	1(2)	2(2)	1(2)	1	S '39
	B29	MTB	Vosper II	1	12	2	2	-	-	-	2(2)	2(2)	(2)	2	S '42
	B30	MTB	Vosper II Var I	1	12	2	2	-	-	-	3(6)	3(6)	-	2	W '43
	B31	MTB	Vosper III	1	12	2	4	-	-	-	1(3)	1(6)	(3)	3	Sp '44
	B32	ML	MA/SB	2	7	1	-	-	-	2	(2)	(2)	(1)	1	Sp '39
	B33	ML	MA/SB Var.	2	7	1	-	-	-	-	1(2)	(2)	(1)	1	F '40
	B34	ML	MGB	1	12	1	-	-	-	2	2(4)	2(6)	(3)	2	Sp '42
	B35	ML	HDML	3	3	2	-	-	-	6	1(2)	(2)	-	1	Sp '40
	B36	ML	Fairmile A	2	7	2	-	-	-	-	2(3)	(2)	-	1	Sp '40
	B37	ML	Fairmile B	2	6	3	-	-	-	-	2(3)	(2)	-	1	W '40
	B38	ML	Fairmile C	2	8	4	-	-	-	-	3(4)	(6)	(3)	2	W '41
	B39	ML	Fairmile D	2	9	4	-	-	-	2	2(4)	(4)	(2)	3	F '42
	B40	MTB	Fairmile D Var I	2	8	4	4	-	-	-	4(6)	2(6)	(2)	4	F '42
	B41	MTB	Fairmile D Var II	2	9	4	2	-	-	-	2(4)	(4)	(2)	3	F '42

* Gunnery strengths in parentheses represent small caliber weaponry, effective only against ML, MTB, and Submarines

ADVANCED SURFACE COMBAT

SURFACE GUNNERY TABLE

Damage Factor Modifications

Gunnery Strength	Range (hexes)					TARGET DEFENSE TYPE				First Fire	Target Sub Fires	NIGHT ACTION *			
	0-10	11-15	16-20	21-30	31+	All Subs	1-2	3-4	5			Star Shell		Visual only	Radar only
												Same hex	Adj. hex		
1	1	2	1	1	0	0	0	0	0	-1	+1	0	-1	-2	-3
2	2	3	2	1	1	-1	0	0	0	-1	+1	0	-1	-2	-3
3	3	4	3	2	2	-1	-1	0	0	-2	+1	0	-1	-2	-3
4	4	5	4	2	2	-2	-1	0	0	-3	+2	0	-1	-2	-3
5 - 6	4	6	6	3	3	-2	-1	-1	0	-4	+2	0	-1	-2	-3
7 - 8	4	7	7	4	3	-3	-2	-1	0	-5	+2	0	-1	-2	-3
9 - 10	4	8	8	5	4	-3	-2	-1	0	-6	+3	0	-1	-2	-3
11 - 14	4	9	9	6	4	-4	-2	-1	0	-7	+3	0	-1	-2	-3
15+	4	10	10	7	5	-4	-2	-1	0	-8	+3	0	-1	-2	-3

* Use only the **worst** modifier (Errata, General 15-4)
Modification values updated per General 15-5 Errata

SURFACE DAMAGE TABLE

Damage Factor

Dice Roll	1	2	3	4	5	6	7	8	9	10
64 - 66	10	12	14	16	18	20	22	24	26	28
61 - 63	8	10	12	14	16	18	18	20	20	22
54 - 56	6	8	10	10	14	15	16	16	16	16
51 - 53	4	6	8	8	10	10	14	14	14	14
44 - 46	2	4	6	6	8	8	10	10	10	10
41 - 43	0	2	4	4	6	6	8	8	8	8
34 - 36	0	0	2	2	4	4	6	6	6	6
31 - 33	0	0	0	0	2	2	4	4	4	4
24 - 26	0	0	0	0	0	0	2	2	2	2
11 - 23	0	0	0	0	0	0	0	0	0	0

A Damage Factor of less than 1 results in no damage

TORPEDO ATTACK - GERMANY

DUD TABLE

Dice Roll	G7A	G7E	FAT	G7E (Mag)	T5	T3
64 - 66	DUD	DUD	DUD	DUD	DUD	DUD
61 - 63	DUD			DUD		
54 - 56				DUD		
11 - 53						

DAMAGE TABLE

Dice Roll	G7A	G7E	FAT	G7E (Mag)	T5	T3
65 - 66	100	135	135	135	50	50
63 - 64	94	126	126	130	45	45
61 - 62	89	119	119	125	42	42
55 - 56	84	112	112	120	40	40
53 - 54	78	105	105	115	38	38
51 - 52	73	98	98	110	35	35
45 - 46	68	91	91	105	33	33
43 - 44	62	84	84	100	30	30
41 - 42	57	77	77	95	28	28
35 - 36	52	70	70	90	25	25
33 - 34	46	63	63	85	23	23
31 - 32	41	56	56	80	20	20
25 - 26	36	49	49	75	18	18
23 - 24	30	42	42	70	15	15
21 - 22	25	35	35	65	13	13
15 - 16	20	28	28	60	10	10
13 - 14	14	21	21	55	7	7
11 - 12	10	14	14	50	5	5

TORPEDO DATA

Type	Speed	Propellant	Avail.	Notes
G7A	12	Steam	F '39	
G7E	8	Electric	S '40	
FAT	8	Electric	W '43	Circling
G7E (Mag)	8	Electric	W '43	Magnetic
T5	7	Electric	F '43	Acoustic
T3	7	Electric	Sp '45	Acoustic, Circling

ACOUSTIC TORPEDO HIT TABLE (51.2.3)

Die Roll	First Acoustic Torpedo	Subsequent Acoustic Torpedoes*
1	Ship	Ship
2	Foxer	Ship
3	Foxer	Ship
4	Foxer	Foxer
5	Foxer	Foxer
6	Foxer	Foxer

* In the same turn

T3 ACOUSTIC TORPEDO HIT TABLE (51.4.3)

Die Roll	Object Hit
1 - 4	Foxer
5 - 6	Ship

UN-AIMED TORPEDO TABLE

Dice Roll	Torpedo speed on turn of fire
64 - 66	1
61 - 63	2
54 - 56	3
51 - 53	4
44 - 46	5
41 - 43	6
34 - 36	7
31 - 33	8 / 4
24 - 26	9 / 1
21 - 23	10 / 7
14 - 16	11 / 5
11 - 13	12 / 3

Use larger number when it is less than or equal to the torpedo's max speed. Otherwise, use the smaller number (35.3.6).

AIMED TORPEDO FIRE (35.2.2)

Crew Quality	Aimed Torpedo Targets *
Novice	3
Experienced	4
Professional	5

* Max. allowed per turn

SUBMARINE VISUAL RANGE

Conditions	Surface	25 ft. (periscope depth)	50-150 ft., Using "S" gear
Sunny Day	Unlimited	35	30
Cloudy Day	Unlimited	25	30
Moonlit Night / Dusk	40	25	30
Dark Night	25	12	30

TORPEDO ATTACK - JAPAN

DUD TABLE

Dice Roll	T95 Mod 1	T92 Mod 1	T95 Mod 2
64 - 66	DUD	DUD	DUD
61 - 63	DUD		DUD
54 - 56			
11 - 53			

TORPEDO DATA

Type	Speed	Propellant	Avail.
T95 Mod 1	14	Oxygen	W '42
T92 Mod 1	8	Electric	W '42
T95 Mod 2	14	Oxygen	W '43

SUBMARINE VISUAL RANGE

Conditions	Surface	25 ft. (periscope depth)
Sunny Day	Unlimited	35
Cloudy Day	Unlimited	25
Moonlit Night / Dusk	40	25
Dark Night	25	12

DAMAGE TABLE

Dice Roll	T95 Mod 1	T92 Mod 1	T95 Mod 2
65 - 66	113	82	150
63 - 64	107	77	142
61 - 62	101	73	134
55 - 56	95	69	126
53 - 54	89	64	118
51 - 52	83	60	110
45 - 46	77	56	102
43 - 44	71	51	94
41 - 42	65	47	86
35 - 36	59	43	78
33 - 34	53	38	70
31 - 32	47	34	62
25 - 26	41	30	54
23 - 24	35	25	46
21 - 22	29	21	38
15 - 16	23	17	30
13 - 14	17	12	22
11 - 12	11	8	15

UN-AIMED TORPEDO TABLE

Dice Roll	Torpedo speed on turn of fire
64 - 66	1
61 - 63	2
54 - 56	3
51 - 53	4
44 - 46	5
41 - 43	6
34 - 36	7
31 - 33	8 / 4
24 - 26	9 / 1
21 - 23	10 / 7
14 - 16	11 / 5
11 - 13	12 / 3

Use larger number when it is less than or equal to the torpedo's max speed. Otherwise, use the smaller number (35.3.6).

AIMED TORPEDO FIRE (35.2.2)

Crew Quality	Aimed Torpedo Targets *
Novice	3
Experienced	4
Professional	5

* Max. allowed per turn

TORPEDO ATTACK - ITALY, FRANCE, RUSSIA

DUD TABLE

Dice Roll	Italy		France		Russia
	W.21	W.17.7	24V	15.7	
64 - 66	DUD	DUD	DUD	DUD	DUD
61 - 63	DUD	DUD	DUD	DUD	DUD
54 - 56					DUD
11 - 53					

TORPEDO DATA

	Type	Speed	Propellant	Avail.	Notes
Italy	W.21	13	Steam	Sp '40	
	W.17.7	12	Steam	Sp '40	
France	24V	13	Steam	F '39	
	15.7	13	Steam	F '39	Max. range 15 hexes
Russia	21"	12	Steam	Sp '41	

DAMAGE TABLE

Dice Roll	Italy		France		Russia
	W.21	W.17.7	24V	15.7	
65 - 66	75	55	94	50	100
63 - 64	71	52	89	45	94
61 - 62	67	49	84	42	89
55 - 56	63	46	79	40	84
53 - 54	59	43	74	38	78
51 - 52	55	40	69	35	73
45 - 46	51	37	64	33	68
43 - 44	47	34	59	30	62
41 - 42	43	31	54	28	57
35 - 36	39	28	49	25	52
33 - 34	35	25	44	23	46
31 - 32	31	22	39	20	41
25 - 26	27	19	34	18	36
23 - 24	23	16	29	15	30
21 - 22	19	13	24	13	25
15 - 16	15	10	19	10	20
13 - 14	11	7	14	7	14
11 - 12	7	5	9	5	10

UN-AIMED TORPEDO TABLE

Dice Roll	Torpedo speed on turn of fire
64 - 66	1
61 - 63	2
54 - 56	3
51 - 53	4
44 - 46	5
41 - 43	6
34 - 36	7
31 - 33	8 / 4
24 - 26	9 / 1
21 - 23	10 / 7
14 - 16	11 / 5
11 - 13	12 / 3

Use larger number when it is less than or equal to the torpedo's max speed. Otherwise, use the smaller number (35.3.6).

SUBMARINE VISUAL RANGE

Conditions	25 ft. (periscope depth)	
	Surface	
Sunny Day	Unlimited	35
Cloudy Day	Unlimited	25
Moonlit Night / Dusk	40	25
Dark Night	25	12

AIMED TORPEDO FIRE (35.2.2)

Crew Quality	Aimed Torpedo Targets *
Novice	3
Experienced	4
Professional	5

* Max. allowed per turn

TORPEDO ATTACK - AMERICA

DUD TABLE

Dice Roll	Mk 10	Mk 14 (Mag)	Mk 14	Mk 18	Mk 18A
64 - 66	DUD	DUD	DUD	DUD	DUD
61 - 63	DUD	DUD	DUD		
54 - 56		DUD			
51 - 53		DUD			
44 - 46		DUD			
41 - 43		DUD			
34 - 36		DUD			
31 - 33		DUD			
11 - 26					

DAMAGE TABLE

Dice Roll	Mk 10	Mk 14 (Mag)	Mk 14	Mk 18	Mk 18A
65 - 66	62	113	113	113	50
63 - 64	58	107	107	107	45
61 - 62	55	101	101	101	42
55 - 56	52	95	95	95	40
53 - 54	48	89	89	89	38
51 - 52	45	83	83	83	35
45 - 46	42	77	77	77	33
43 - 44	38	71	71	71	30
41 - 42	35	65	65	65	28
35 - 36	32	59	59	59	25
33 - 34	28	53	53	53	23
31 - 32	25	47	47	47	20
25 - 26	22	41	41	41	18
23 - 24	18	35	35	35	15
21 - 22	15	29	29	29	13
15 - 16	12	23	23	23	10
13 - 14	8	17	17	17	7
11 - 12	6	11	11	11	5

TORPEDO DATA

Type	Speed	Propellant	Avail.	Notes
Mk 10	10	Steam	W '42	
Mk 14 (Mag)*	13	Steam	W '42	Magnetic
Mk 14	13	Steam	F '43	
Mk 18	8	Electric	F '43	
Mk 18A	8	Electric	W '45	Acoustic

* Added Mk 14 (Mag) as a distinct torpedo type

UN-AIMED TORPEDO TABLE

Dice Roll	Torpedo speed on turn of fire
64 - 66	1
61 - 63	2
54 - 56	3
51 - 53	4
44 - 46	5
41 - 43	6
34 - 36	7
31 - 33	8 / 4
24 - 26	9 / 1
21 - 23	10 / 7
14 - 16	11 / 5
11 - 13	12 / 3

Use larger number when it is less than or equal to the torpedo's max speed. Otherwise, use the smaller number (35.3.6).

AIMED TORPEDO FIRE (35.2.2)

Crew Quality	Aimed Torpedo Targets *
Novice	3
Experienced	4
Professional	5

* Max. allowed per turn

ACOUSTIC TORPEDO HIT TABLE (51.2.3)

Die Roll	First Acoustic Torpedo	Subsequent Acoustic Torpedoes*
1	Ship	Ship
2	Foxer	Ship
3	Foxer	Ship
4	Foxer	Foxer
5	Foxer	Foxer
6	Foxer	Foxer

* In the same turn

SUBMARINE VISUAL RANGE

Conditions	Surface	25 ft. (periscope depth)
Sunny Day	Unlimited	35
Cloudy Day	Unlimited	25
Moonlit Night / Dusk	40	25
Dark Night	25	12

TORPEDO ATTACK - BRITAIN

DUD TABLE

Dice Roll	Mk VIII
64 - 66	DUD
61 - 63	DUD
54 - 56	
51 - 53	
44 - 46	
41 - 43	
34 - 36	
31 - 33	
11 - 26	

DAMAGE TABLE

Dice Roll	Mk VIII
65 - 66	94
63 - 64	89
61 - 62	84
55 - 56	79
53 - 54	74
51 - 52	69
45 - 46	64
43 - 44	59
41 - 42	54
35 - 36	49
33 - 34	44
31 - 32	39
25 - 26	34
23 - 24	29
21 - 22	24
15 - 16	19
13 - 14	14
11 - 12	9

TORPEDO DATA

Type	Speed	Propellant	Avail.
Mk VIII	12	Steam	F '39

UN-AIMED TORPEDO TABLE

Dice Roll	Torpedo speed on turn of fire
64 - 66	1
61 - 63	2
54 - 56	3
51 - 53	4
44 - 46	5
41 - 43	6
34 - 36	7
31 - 33	8 / 4
24 - 26	9 / 1
21 - 23	10 / 7
14 - 16	11 / 5
11 - 13	12 / 3

Use larger number when it is less than or equal to the torpedo's max speed. Otherwise, use the smaller number (35.3.6).

SUBMARINE VISUAL RANGE

Conditions	Surface	25 ft. (periscope depth)
Sunny Day	Unlimited	35
Cloudy Day	Unlimited	25
Moonlit Night / Dusk	40	25
Dark Night	25	12

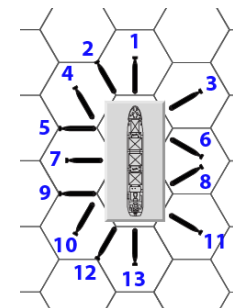
AIMED TORPEDO FIRE (35.2.2)

Crew Quality	Aimed Torpedo Targets *
Novice	3
Experienced	4
Professional	5

* Max. allowed per turn

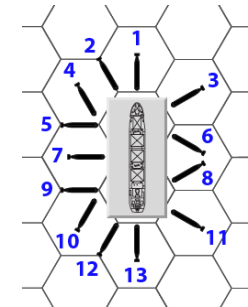
TORPEDO DETONATION - GERMANY

Class	Torpedo Attitude													Modifications to Colored Die		
	1	2	3	4	5	6	7	8	9	10	11	12	13	"Dead in water"	Un-aimed Torpedo	Shallow Running
R17	14	14	16	14	23	21	66	22	23	13	15	13	12	-1	+1	+1
Z	16	26	42	32	54	48	66	51	54	31	41	25	15	-1	+1	+1
F	14	21	26	22	35	33	66	34	35	21	25	16	13	-1	+1	+1
R151	14	14	16	14	23	21	66	22	23	13	15	13	12	-1	+1	+1
	1	2	3	4	5	6	7	8	9	10	11	12	13			
Gneisenau	31	44	66	53	66	66	66	66	66	52	65	43	26	-1	+1	+1
Admiral Scheer	23	36	61	44	66	66	66	66	66	43	56	35	22	-1	+1	+1
Prinz Eugen	23	36	62	44	66	66	66	66	66	43	61	35	22	-1	+1	+1
Tirpitz	General 19-6: Use values for Gneisenau and subtract 1 from white die													-1	+1	+1
Leipzig / Koln	21	32	56	66	66	66	66	66	66	41	55	31	16	-1	+1	+1
Nurnberg	21	32	56	66	66	66	66	66	66	41	55	31	16	-1	+1	+1
	1	2	3	4	5	6	7	8	9	10	11	12	13			
C2	21	31	45	34	61	54	66	55	61	33	44	26	16	-1	+1	+1
C3	22	32	51	35	63	55	66	56	63	34	46	31	21	-1	+1	+1
T2	22	33	52	35	64	56	66	61	64	34	51	32	21	-1	+1	+1
T3	23	34	54	35	64	56	66	61	64	34	53	33	22	-1	+1	+1



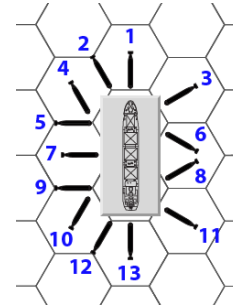
TORPEDO DETONATION - JAPAN

Class	Torpedo Attitude													Modifications to Colored Die		
	1	2	3	4	5	6	7	8	9	10	11	12	13	"Dead in water"	Un-aimed Torpedo	Shallow Running
Akatsuki	15	24	36	26	51	43	66	44	51	25	35	23	14	-1	+1	+1
Hatsuharu	15	24	35	26	46	43	66	44	46	25	34	23	14	-1	+1	+1
Kamikaze	14	23	34	25	45	42	66	43	45	24	33	22	13	-1	+1	+1
Sub Chaser #1	12	21	26	22	35	33	66	34	35	21	25	16	11	-1	+1	+1
Shimikaze	15	25	42	32	54	46	66	51	54	31	41	24	14	-1	+1	+1
Etorufu	15	21	26	22	36	33	66	34	35	21	25	16	14	-1	+1	+1
Sub Chaser #28	13	14	22	15	25	23	66	24	25	14	21	13	12	-1	+1	+1
Kaibokan I	14	18	24	21	33	31	66	32	33	16	23	15	13	-1	+1	+1
Kaibokan II	14	16	25	21	35	31	66	32	33	16	24	15	13	-1	+1	+1
Ukuru B	14	21	26	22	35	33	66	34	35	21	25	16	13	-1	+1	+1
Matsu	14	23	33	25	43	41	66	42	43	24	32	22	13	-1	+1	+1
	1	2	3	4	5	6	7	8	9	10	11	12	13			
Yamato	34	46	66	55	66	66	66	66	66	54	65	45	33	-1	+1	+1
Shokaku	25	45	66	54	66	66	66	66	66	53	65	44	24	-1	+1	+1
Mogami	23	36	62	44	66	66	66	66	66	43	61	35	22	-1	+1	+1
Kako	General 18-6: no data provided													-1	+1	+1
Taiyo	General 18-6: no data provided													-1	+1	+1
Unryu	General 18-6: no data provided													-1	+1	+1
Kuma	General 18-6: no data provided													-1	+1	+1
	1	2	3	4	5	6	7	8	9	10	11	12	13			
C2	21	31	45	34	61	54	66	55	61	33	44	26	16	-1	+1	+1
C3	22	32	51	35	63	55	66	56	63	34	46	31	21	-1	+1	+1
T2	22	33	52	35	64	56	66	61	64	34	51	32	21	-1	+1	+1
T3	23	34	54	35	64	56	66	61	64	34	53	33	22	-1	+1	+1



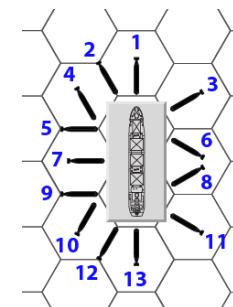
TORPEDO DETONATION - ITALY, FRANCE, RUSSIA

		Torpedo Attitude													Modifications to Colored Die		
Class		1	2	3	4	5	6	7	8	9	10	11	12	13	"Dead in water"	Un-aimed Torpedo	Shallow Running
Italy	Spica	14	22	31	23	36	34	66	35	36	22	26	21	13	-1	+1	+1
	Animoso	15	22	32	24	41	35	66	36	41	23	31	21	14	-1	+1	+1
	Gabbiano	14	16	25	21	33	31	66	32	33	16	24	15	13	-1	+1	+1
Russia	7	15	25	41	31	53	45	66	46	53	26	36	24	14	-1	+1	+1
	BO-2	13	15	22	16	25	24	66	25	25	15	21	14	12	-1	+1	+1
	C2	21	31	45	34	61	54	66	55	61	33	44	26	16	-1	+1	+1
	C3	22	32	51	35	63	55	66	56	63	34	46	31	21	-1	+1	+1
	T2	22	33	52	35	64	56	66	61	64	34	51	32	21	-1	+1	+1
	T3	23	34	54	35	64	56	66	61	64	34	53	33	22	-1	+1	+1



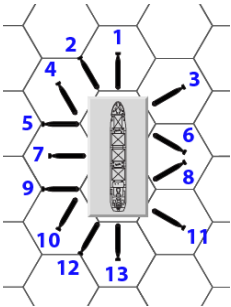
TORPEDO DETONATION - AMERICA

Class	Torpedo Attitude													Modifications to Colored Die		
	1	2	3	4	5	6	7	8	9	10	11	12	13	"Dead in water"	Un-aimed Torpedo	Shallow Running
Flush Deck	14	23	34	25	44	41	66	42	44	24	33	22	13	-1	+1	+1
Craven	15	24	35	26	46	43	66	44	46	25	34	23	14	-1	+1	+1
Benson	15	25	41	31	52	45	66	46	52	26	36	24	14	-1	+1	+1
Sub Chaser #1	13	15	23	16	26	25	66	26	26	15	22	14	12	-1	+1	+1
Sub Chaser #2	15	15	23	16	31	25	66	26	31	15	22	14	14	-1	+1	+1
Fletcher	16	24	36	26	46	43	66	44	46	25	35	23	15	-1	+1	+1
Evarts	15	22	33	24	42	36	66	41	42	23	32	21	14	-1	+1	+1
Buckly	15	23	33	25	43	36	66	41	43	24	32	22	14	-1	+1	+1
Cannon	15	23	33	25	43	36	66	41	43	24	32	22	14	-1	+1	+1
Edsall	15	23	33	25	43	36	66	41	43	24	32	22	14	-1	+1	+1
Frigate	15	22	33	24	42	36	66	41	42	23	32	21	14	-1	+1	+1
Sumner	16	25	41	31	52	45	66	46	52	26	36	24	15	-1	+1	+1
	1	2	3	4	5	6	7	8	9	10	11	12	13			
Iowa	32	52	66	61	66	66	66	66	66	56	65	51	31	-1	+1	+1
North Carolina	32	43	66	52	66	66	66	66	66	51	65	42	31	-1	+1	+1
Enterprise	25	45	66	53	66	66	66	66	66	52	65	44	24	-1	+1	+1
Indianapolis	23	36	61	43	66	66	66	66	66	42	56	35	22	-1	+1	+1
	1	2	3	4	5	6	7	8	9	10	11	12	13			
C2	21	31	45	34	61	54	66	55	61	33	44	26	16	-1	+1	+1
C3	22	32	51	35	63	55	66	56	63	34	46	31	21	-1	+1	+1
T2	22	33	52	35	64	56	66	61	64	34	51	32	21	-1	+1	+1
T3	23	34	54	35	64	56	66	61	64	34	53	33	22	-1	+1	+1
EC2	24	26	44	33	56	53	66	54	56	32	43	25	23	-1	+1	+1
VC3	24	31	45	33	56	53	66	54	56	32	44	26	23	-1	+1	+1



TORPEDO DETONATION - BRITAIN

Class	Torpedo Attitude													Modifications to Colored Die		
	1	2	3	4	5	6	7	8	9	10	11	12	13	"Dead in water"	Un-aimed Torpedo	Shallow Running
V Type 1	14	23	33	24	43	36	66	41	43	23	32	22	13	-1	+1	+1
V Type 2	14	23	33	24	43	36	66	41	43	23	32	22	13	-1	+1	+1
W	14	23	33	24	43	36	66	41	43	23	32	22	13	-1	+1	+1
Town	14	23	34	25	44	41	66	42	44	24	33	22	13	-1	+1	+1
A	14	23	34	25	44	41	66	42	44	24	33	22	13	-1	+1	+1
I	14	23	34	25	44	41	66	42	44	24	33	22	13	-1	+1	+1
J	15	24	35	26	46	43	66	44	46	25	34	23	14	-1	+1	+1
M	15	24	35	26	51	43	66	44	51	25	34	23	14	-1	+1	+1
Tribal	15	24	36	26	51	44	66	45	51	25	35	23	14	-1	+1	+1
Black Swan	15	22	32	24	42	35	66	36	42	23	31	21	14	-1	+1	+1
Hunt	14	22	32	23	41	34	66	35	41	22	31	21	13	-1	+1	+1
Bittern	16	22	32	23	41	34	66	35	41	22	31	21	14	-1	+1	+1
Havant	14	23	33	24	43	36	66	41	43	23	32	22	13	-1	+1	+1
Flower	15	16	24	21	32	26	66	31	32	16	23	15	14	-1	+1	+1
O	15	24	35	26	46	43	66	44	46	25	34	23	14	-1	+1	+1
Q	15	24	35	25	45	42	66	43	45	24	34	23	14	-1	+1	+1
Captain	15	23	33	24	43	36	66	41	43	23	32	22	14	-1	+1	+1
River	15	22	32	24	42	35	66	36	42	23	31	21	14	-1	+1	+1
Loch	15	22	32	24	42	35	66	36	42	23	31	21	14	-1	+1	+1
Battle	16	24	36	26	51	44	66	45	51	25	35	23	15	-1	+1	+1
	1	2	3	4	5	6	7	8	9	10	11	12	13			
Barham	26	36	61	43	66	66	66	66	66	42	56	35	25	-1	+1	+1
Royal Oak	26	35	56	43	66	66	66	66	66	42	55	34	25	-1	+1	+1
King George V	31	43	66	51	66	66	66	66	66	46	65	42	26	-1	+1	+1
Ark Royal	26	42	65	46	66	66	66	66	66	45	64	41	25	-1	+1	+1
Ajax	21	33	53	41	66	62	66	66	66	36	52	32	16	-1	+1	+1
Avenger	23	32	46	34	63	55	66	56	63	33	45	31	22	-1	+1	+1
	1	2	3	4	5	6	7	8	9	10	11	12	13			
C2	21	31	45	34	61	54	66	55	61	33	44	26	16	-1	+1	+1
C3	22	32	51	35	63	55	66	56	63	34	46	31	21	-1	+1	+1
T2	22	33	52	35	64	56	66	61	64	34	51	32	21	-1	+1	+1
T3	23	34	54	35	64	56	66	61	64	34	53	33	22	-1	+1	+1
EC2	24	26	44	33	56	53	66	54	56	32	43	25	23	-1	+1	+1
VC3	24	31	45	33	56	53	66	54	56	32	44	26	23	-1	+1	+1



ASW ATTACK BY AXIS ESCORT

Used by Allied Submarine player when under ASW attack by Axis Escorts

DEPTH CHARGE DAMAGE

Dice Roll	250 LB. DEPTH CHARGE			300 LB. DEPTH CHARGE		
	Same depth	Within 25ft.	Within 50 ft.	Same depth	Within 25ft.	Within 50 ft.
64 - 66	17	13	8	20	15	10
61 - 63	15	11	6	18	12	8
54 - 56	13	9	4	16	10	6
51 - 53	11	7	2	14	8	4
44 - 46	9	5	1	12	6	2
41 - 43	7	3	1	10	4	1
34 - 36	6	2	1	6	2	1
31 - 33	4	2	1	6	2	1
24 - 26	3	1	0	4	1	0
21 - 23	2	1	0	2	1	0
14 - 16	1	0	0	1	0	0
11 - 13	0	0	0	1	0	0

Subs between 200-375 ft. (inclusive) take double damage

DICE ROLL MODIFICATIONS

Sub Def. Type	Colored Die	White Die	Sub Depth	Colored Die	White Die
0	-1		25 - 150	+1	
1		-4	175 - 250		+3
2		-2	275 - 350		0
3		0	375 - 450		-3
4		+3	475 - 600	-1	
5	+1		625 - 750	-2	
			775+	-3	

ASW ATTACK BY ALLIED ESCORT

Used by Axis Submarine player when under ASW attack by Allied Escorts

DEPTH CHARGE DAMAGE

Dice Roll	300 LB. D.C., Mk X* D.C., or SQUID			600 LB. DEPTH CHARGE			300 LB. TEARDROP		
	Same depth	Within 25ft.	Within 50 ft.	Same depth	Within 25ft.	Within 50 ft.	Same depth	Within 25ft.	Within 50 ft.
64 - 66	20	15	10	30	20	12	20	15	10
61 - 63	18	12	8	25	18	10	19	14	9
54 - 56	16	10	6	20	15	8	18	13	8
51 - 53	14	8	4	15	12	6	16	12	7
44 - 46	12	6	2	12	9	4	14	11	6
41 - 43	10	4	1	10	6	2	12	10	5
34 - 36	6	2	1	8	4	1	10	8	4
31 - 33	6	2	1	6	2	1	8	6	3
24 - 26	4	1	0	3	1	1	6	4	2
21 - 23	2	1	0	2	1	1	4	2	1
14 - 16	1	0	0	1	1	0	2	1	1
11 - 13	0	0	0	1	0	0	2	1	1

Subs between 200-375 ft. (inclusive) take double damage
Subs 400 ft. or deeper take triple damage

* Mk X depth charge causes quadruple damage (51.5.3)

DICE ROLL MODIFICATIONS - DEPTH CHARGE

Sub Def. Type	Colored Die	White Die	Sub Depth	Colored Die	White Die
0	-1		25 - 150	+1	
1		-4	175 - 250		+3
2		-2	275 - 350		0
3		0	375 - 450		-3
4		+3	475 - 600	-1	
5	+1		625 - 750	-2	
			775+	-3	

HEDGEHOG DAMAGE

Dice Roll	Submarine Depth					
	25-100	125-175	200-275	300-375	400-475	500+
64 - 66	40	50	75	100	100	120
61 - 63	30	40	60	80	50	0
54 - 56	20	30	50	50	0	0
51 - 53	20	25	40	0	0	0
44 - 46	20	20	0	0	0	0
41 - 43	20	0	0	0	0	0
34 - 36	20	0	0	0	0	0
31 - 33	20	0	0	0	0	0
11 - 26	0	0	0	0	0	0

DICE ROLL MODIFICATIONS - HEDGEHOG

Sub Def. Type	Colored Die	White Die	Sub Current Speed	Colored Die	White Die
0		-4	0	+1	
1		-2	1		0
2		0	2		-3
3		+2	3	-1	
4		+4	4	-2	
5	+1		5	-3	

RADAR & VISUAL SEARCH BY ALLIED VESSEL

Used by Axis Submarine player when Allied vessels conduct search

RADAR & NIGHT VISUAL SEARCH RANGE					RADAR & NIGHT VISUAL RANGE MODIFICATIONS	
Dice Roll	RADAR SEARCH				NIGHT VISUAL SEARCH *	
	Standard Radar	10cm Radar	3cm Radar		Sub Depth	
			Surface	"Snort" deployed	0 ft.	25 ft.
65 - 66	36	46	46	18	28	9
63 - 64	34	40	40	18	20	8
61 - 62	32	36	38	17	16	7
55 - 56	30	34	36	15	14	6
53 - 54	28	32	34	13	12	5
51 - 52	26	30	32	12	10	4
45 - 46	24	28	30	10	9	4
43 - 44	22	26	28	9	8	4
41 - 42	20	24	27	8	7	4
35 - 36	18	22	26	7	6	4
33 - 34	16	20	25	6	5	4
31 - 32	12	16	24	6	4	4
25 - 26	10	12	23	5	4	4
23 - 24	10	10	22	5	4	4
21 - 22	10	10	21	5	4	4
15 - 16	10	10	20	5	4	4
13 - 14	10	10	19	5	4	4
11 - 12	10	10	19	5	4	4

Results less than 0 are treated as 0

* German Escorts add 1 to Colored Die

Crew Quality *	Professional	+4
	Experienced	+2
Weather	Clear	0
	Rough	-4
	Storm	-7
	Gale	-10

* Applies to Radar Search only. Modifiers are cumulative

RADAR & VISUAL SEARCH BY AXIS VESSEL

Used by Allied Submarine player when Axis vessels conduct search

RADAR & NIGHT VISUAL SEARCH RANGE				
Dice Roll	RADAR SEARCH		NIGHT VISUAL SEARCH	
	Japanese Radar	Other Radars	Sub Depth	
			0 ft.	25 ft.
65 - 66	15	36	28	9
63 - 64	14	34	20	8
61 - 62	13	32	16	7
55 - 56	12	30	14	6
53 - 54	11	28	12	5
51 - 52	10	26	10	4
45 - 46	9	24	9	4
43 - 44	9	22	8	4
41 - 42	8	20	7	4
35 - 36	8	18	6	4
33 - 34	7	16	5	4
31 - 32	7	12	4	4
25 - 26	6	10	4	4
23 - 24	6	10	4	4
21 - 22	5	10	4	4
15 - 16	5	10	4	4
13 - 14	5	10	4	4
11 - 12	5	10	4	4

Results less than 0 are treated as 0

RADAR & NIGHT VISUAL RANGE MODIFICATIONS		
Crew Quality *	Professional	+4
	Experienced	+2
Weather	Clear	0
	Rough	-4
	Storm	-7
	Gale	-10

* Applies to Radar Search only. Modifiers are cumulative

SUBMARINE VISUAL RANGE		
Conditions	Surface	25 ft. (periscope depth)
	Unlimited	35
Sunny Day	Unlimited	25
Cloudy Day	40	25
Moonlit Night / Dusk	25	12
Dark Night		

SONAR SEARCH BY ALLIED ESCORT

Used by Axis Submarine player when Allied Escorts conduct search

SONAR / ASDIC SWEEP RANGE

Dice Roll	Sonar/ ASDIC	Improved Sonar/ ASDIC
65 - 66	15	30
63 - 64	13	28
61 - 62	12	26
55 - 56	11	24
53 - 54	10	22
51 - 52	9	20
45 - 46	8	18
43 - 44	6	16
41 - 42	5	14
35 - 36	5	12
33 - 34	5	10
31 - 32	5	9
25 - 26	5	8
23 - 24	5	7
21 - 22	5	6
15 - 16	5	5
13 - 14	5	5
11 - 12	5	5

A Sonar Sweep cannot be conducted at speed greater than 3.

Results less than 0 are treated as 0.

DEPTH CONTACT

Range (hexes)	No "Q" Apparatus	With "Q" Apparatus
0	25	50
1	50	125
2	100	200
3	150	275
4	200	350
5	250	425
6	300	500
7	350	575
8	400	650
9	450	725
10	500	800
11	550	875
12	600	950
13	650	1000
14	700	-
15	750	-
16	800	-
17	850	-
18	900	-
19	950	-
20	1000	-

SONAR HOMING

Dice Roll	Escort Speed					Sonar/ASDIC Improved Sonar/ASDIC
	0-1	2	3	4	5	
63 - 66	-	-	-	-	-	
61 - 62	C	-	-	-	-	
55 - 56	C	C	-	-	-	
53 - 54	C	C	C	-	-	
51 - 52	C	C	C	-	-	
45 - 46	C	C	C	C	-	
43 - 44	C	C	C	C	-	
41 - 42	C	C	C	C	C	
35 - 36	C	C	C	C	C	
33 - 34	C	C	C	C	C	
31 - 32	C	C	C	C	C	
25 - 26	C	C	C	C	C	
23 - 24	C	C	C	C	C	
21 - 22	C	C	C	C	C	
15 - 16	C	C	C	C	C	
13 - 14	C	C	C	C	C	
11 - 12	C	C	C	C	C	

A submarine beyond maximum sonar sweep range cannot be detected by sonar homing

SONAR / ASDIC SWEEP RANGE MODIFICATIONS

Crew Quality	Professional	+4
	Experienced	+2
Weather	Clear	0
	Rough	-4
	Storm	-7
	Gale	-10
"Foxyer"	"Foxyer" deployed	-7

Modifiers are cumulative

SONAR HOMING MODIFICATIONS

Situation	Colored Die
Submarine is: • Reloading torpedo tubes • Using Emergency Power • Making repairs	-1
Submarine silent running within depth contact	+1
Submarine silent running below depth contact	+4
Escort has "Foxyer" deployed	+2

SONAR SEARCH BY AXIS ESCORT

Used by Allied Submarine player when Axis Escorts conduct search

SONAR SWEEP RANGE

Dice Roll	Sonar	Improved Sonar
65 - 66	15	28
63 - 64	13	25
61 - 62	12	22
55 - 56	11	19
53 - 54	10	16
51 - 52	9	14
45 - 46	8	12
43 - 44	6	10
41 - 42	5	9
35 - 36	5	8
33 - 34	5	7
31 - 32	5	6
25 - 26	5	5
23 - 24	5	5
21 - 22	5	5
15 - 16	5	5
13 - 14	5	5
11 - 12	5	5

A Sonar Sweep cannot be conducted at speed greater than 3

Results less than 0 are treated as 0

DEPTH CONTACT

Range (hexes)	
0	25
1	50
2	100
3	150
4	200
5	250
6	300
7	350
8	400
9	450
10	500
11	550
12	600
13	650
14	700
15	750
16	800
17	850
18	900
19	950
20	1000

SONAR HOMING

Dice Roll	Escort Speed					Japanese Sonar	Sonar	Improved Sonar
	0-1 2 3							
	0-1 2 3 4							
	0-1	2	3	4	5			
63 - 66	-	-	-	-	-			
61 - 62	C	-	-	-	-			
55 - 56	C	C	-	-	-			
53 - 54	C	C	C	-	-			
51 - 52	C	C	C	-	-			
45 - 46	C	C	C	C	-			
43 - 44	C	C	C	C	-			
41 - 42	C	C	C	C	C			
35 - 36	C	C	C	C	C			
33 - 34	C	C	C	C	C			
31 - 32	C	C	C	C	C			
25 - 26	C	C	C	C	C			
23 - 24	C	C	C	C	C			
21 - 22	C	C	C	C	C			
15 - 16	C	C	C	C	C			
13 - 14	C	C	C	C	C			
11 - 12	C	C	C	C	C			

A submarine beyond maximum sonar sweep range cannot be detected by sonar homing

SONAR / ASDIC SWEEP RANGE MODIFICATIONS

Crew Quality	Professional	+4
	Experienced	+2
Weather	Clear	0
	Rough	-4
	Storm	-7
	Gale	-10

Modifiers are cumulative

SONAR HOMING MODIFICATIONS

Situation	Colored Die
Submarine is: • Reloading torpedo tubes • Using Emergency Power • Making repairs	-1
Submarine silent running within depth contact	+1
Submarine silent running below depth contact	+4

PROLONGED ATTACK

PROLONGED ATTACK (34.75)

Attack Points

Each vessel without sonar	1
Each vessel with Japanese sonar	2
Each vessel with ordinary sonar	3
Each vessel with improved sonar	4

Defense Points

Sub max. submerged speed = 1	1
Sub max. submerged speed = 2	2
Sub max. submerged speed = 3	3
Sub max. submerged speed = 4	4
Sub max. submerged speed = 5+	5

Point Difference (Attack - Defense)

Dice Roll	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9+
65 - 66	20	25	30	35	40	42	44	46	48	50	52	54	56	58
63 - 64	18	23	28	33	38	40	42	43	45	46	48	49	50	50
61 - 62	16	21	26	31	36	38	40	41	42	43	44	45	46	47
55 - 56	14	19	24	29	34	36	38	40	41	42	43	44	45	46
53 - 54	12	17	22	27	32	34	36	38	40	41	42	43	44	45
51 - 52	10	15	20	25	30	32	34	36	38	40	41	42	43	44
45 - 46	8	13	18	23	28	30	32	34	36	38	40	41	42	43
43 - 44	6	11	16	21	26	28	30	32	34	36	38	40	41	42
41 - 42	4	9	14	19	24	26	28	30	32	34	36	38	40	41
35 - 36	2	7	12	17	22	24	26	28	30	32	34	36	38	40
33 - 34	-	5	10	15	20	22	24	26	28	30	32	34	36	38
31 - 32	-	3	8	13	18	20	22	24	26	28	30	32	34	36
25 - 26	-	1	6	11	16	18	20	22	24	26	28	30	32	34
23 - 24	-	-	4	9	14	16	18	20	22	24	26	28	30	32
21 - 22	-	-	2	7	12	14	16	18	20	22	24	26	28	30
15 - 16	-	-	-	5	10	12	14	16	18	20	22	24	26	28
13 - 14	-	-	-	3	8	10	12	14	16	18	20	22	24	26
11 - 12	-	-	-	1	6	8	10	12	14	16	18	20	22	24

MISCELLANEOUS TABLES

WEATHER (50.3)

Dice Roll	Scenario Location		
	Pacific	Atlantic / North Sea	Mediterranean
66	Gale	Gale	Gale
64 - 65	Gale	Gale	Storm
61 - 63	Storm	Gale	Storm
54 - 56	Storm	Storm	Rough
41 - 53	Rough	Storm	Rough
34 - 36	Clear	Rough	Rough
21 - 33	Clear	Rough	Clear
11 - 16	Clear	Clear	Clear

CREW QUALITY (49.6)

Die Roll *	Crew Quality
4 - 6	Novice
2 - 3	Experienced
1	Professional

* Order reversed to match other charts

SUB VS. SUB TORPEDO DETONATION (54.3)

Sub Defense Type	Japanese Detonation Table Entry
0	Sub Chaser #28
1	Kaibokan II
2	Ukuru B
3	Kamikaze
4	Akatsuki
5	Shimikaze

EVASION (40.9)

Dice Roll	Target Speed								
	10+			9 – 5			4 – 1		
	Torpedo Propellant			Torpedo Propellant			Torpedo Propellant		
	steam	oxygen	electric	steam	oxygen	electric	steam	oxygen	electric
64 - 66	Turn (1)	Turn (1)	Turn	Turn (1)	Turn (1)	Turn	Turn	Turn	Turn
61 - 63	Turn (1)	Turn (1)	0	Turn (1)	Turn (1)	0	Turn	Turn	0
54 - 56	Turn (1)	Turn (1)	0	Turn (1)	Turn (1)	0	Turn	Turn	0
51 - 53	Turn (1)	Turn (1)	0	Turn (1)	Turn	0	Turn	Turn	0
44 - 46	Turn (1)	Turn	0	Turn	Turn	0	Turn	Turn	0
41 - 43	Turn (1)	Turn	0	Turn	Turn	0	Turn	Turn	0
34 - 36	Turn	0	0	Turn	0	0	Turn	0	0
31 - 33	Turn	0	0	Turn	0	0	Turn	0	0
24 - 26	0	0	0	0	0	0	0	0	0
21 - 23	0	0	0	0	0	0	0	0	0
14 - 16	0	0	0	0	0	0	0	0	0
11 - 13	0	0	0	0	0	0	0	0	0

Shallow running torpedo: Add 1 to colored die

RELOAD RATE (59.1)

Crew Rating	Turns to Reload	
	Advanced game	Basic / Optional game
Professional	12	24
Experienced	15	30
Novice	18	36

DESIGN YOUR OWN SCENARIOS

DEPTH CHARGE AVAILABILITY (61.2)

Escort Type	Nationality					
	German	Italian	Russian	British	American	Japanese
DD	A		A	B	C	B
DE		B		E	E	
E	B					E
C		B		D		
PF or F				C	D	
S				D		
SC			B		B	B
ML	B					
TB		B				

Dice Roll	Table A	Table B	Table C	Table D	Table E
64 - 66	18	36	50	75	120
61 - 63	18	36	50	75	120
54 - 56	18	36	50	75	120
51 - 53	12	30	40	65	110
44 - 46	12	30	40	65	110
41 - 43	12	30	40	55	100
34 - 36	12	24	40	55	90
31 - 33	12	24	30	45	80
24 - 26	6	24	30	45	70
21 - 23	6	18	30	35	60
14 - 16	6	18	20	35	50
11 - 13	6	12	20	25	40

TORPEDO AVAILABILITY (62.2)

Dice Roll	Availability Decimal
64 - 66	1.0
61 - 63	1.0
54 - 56	1.0
51 - 53	0.7
44 - 46	0.7
41 - 43	0.7
34 - 36	0.5
31 - 33	0.5
24 - 26	0.5
21 - 23	0.4
14 - 16	0.3
11 - 13	0.2

ATW AVAILABILITY (61.5)

Dice Roll	ATW Rounds Available
64 - 66	10
61 - 63	10
54 - 56	9
51 - 53	9
44 - 46	8
41 - 43	8
34 - 36	6
31 - 33	6
24 - 26	5
21 - 23	5
14 - 16	4
11 - 13	3

CARGO (60.2)

C2, EC, VC: General Cargo

Dice Roll	Cargo	Log Code	V. P.
66	Military Stores	MS	15
64 - 65	Explosives	E	18 **
61 - 63	Sugar	S	10
54 - 56	Timber	T	8 *
43 - 53	Grain	Gr	15
26 - 42	Ore	O	12
11 - 25	General	G	8

C3: Reefer (refrigerated cargo)

Dice Roll	Cargo	Log Code	V. P.
65 - 66	Military Stores	MS	20
62 - 64	Grain	Gr	18
53 - 61	Perishables	P	20
43 - 52	General	G	15
11 - 42	Meat	M	18

T2: Tanker

Dice Roll	Cargo	Log Code	V. P.
65 - 66	Lubricating Oil	LO	32
63 - 64	Crude Oil	CO	24
55 - 62	Naval Fuel	NF	30
46 - 54	Diesel Oil	DF	28
32 - 45	Fuel Oil	FO	26
11 - 31	Aviation Fuel	AF	32 **

Note: A T-3 Tanker is always worth 32 VP's

* Triple number of hit points needed to sink

** Double amount of damage received

Editor's note: Reversed row order to match other charts

SEQUENCE OF PLAY: BASIC / OPTIONAL GAME

1. Movement Plotting (7)

1. Plot Submarine Movement (7.3)
2. Plot Torpedo Movement Plot (11.4)
3. Plot Convoy Movement (7.6.2)

2. Surface Gunnery Attack (17)

3. (Optional) *Fire / Remove Star Shells (25)*

4. Convoy Movement (7.6)

5. Escort Movement (6, 8.1, 8.2)

1. Launch ASW Attacks (15)
2. (Optional) *Conduct Radar and Sonar Search (22, 23)*

6. (Optional) *Hide Submarines Lost by Sonar Homing (22.6)*

7. Torpedo Launch and Movement (11, 12)

8. Submarine Movement and Depth Change (6, 8.3)

9. Anti-Submarine Attack Resolution (15, 16)

10. (Optional) *Hide Submarines out of Visual or Radar Contact (23.7)*