

H2

HIT DETERMINATION – ADVANCED METHOD

1 TARGET SIZE		
01 to 40 DP	-	4
41 to 80 DP	-	2
81 to 200 DP		0
201 to 500 DP	+	2
501 to 1000 DP	+	4
Over 1000 DP	+	6
2 BEARING FROM TARGET		
Position A (0 to 15 degrees)		0
Position B (16 to 45 degrees)	+	8
Position C (46 to 90 degrees)	+	15
3 FIRING SHIP UNDER FIRE		
Hit during last turn	-	8
4 OVER CONCENTRATION		
1 ship only firing at target		0
2 to 3 ships firing at target	-	5
4 or more ships firing at target	-	10
5 FIRE CONTROL SYSTEM		
Post 1930 DCT System	+	26
Post 1930 Local RF	+	19
1914-30 DCT System	+	15
1914-30 Top RF	+	12
1914-30 Local RF	+	8
1900-1919 Top RF	+	3
1900-1919 Local RF	-	2
1880-99 Top spot	-	8
1880-99 Local spot	-	12
6 RADAR ASSISTED FIRE CONTROL		
1939-42 FC Radars	+	14
1942-44 FC Radars	+	22
1944-45 FC Radars	+	30
7 RANGE TO TARGET		
Less than 4,000 yards	+	21
4,000 to 8,000 yards	+	18
8,100 to 12,000 yards	+	15
12,100 to 16,000 yards	+	10
16,100 to 20,000 yards	+	4
20,100 to 24,000 yards		0
24,100 to 30,000 yards	-	5
More than 30,000 yards	-	12
8 CHANGE OF TARGET		
Firing on new target	-	14
9 SPEED OF TARGET		
Less than 5 knots	+	15
5 to 10 knots	+	11
11 to 15 knots	+	6
16 to 20 knots		0
21 to 25 knots	-	3
26 to 30 knots	-	5
31 to 36 knots	-	8
More than 36 knots	-	12
10 SPOTTER AIRCRAFT		
Aircraft spotting shell splashes	+	10
11 EVASIVE MANEUVER		
Target only in evasive maneuver	-	6
Firing ship only in evasive maneuver	-	12
Both ships in evasive maneuver	-	18
12 SEA STATE		
Beaufort 0 to 6		0
Beaufort 7 (ships under 200 DP)	-	4
Beaufort 8 (ships under 400 DP)	-	8
Beaufort 9 (ships under 600 DP)	-	14
Beaufort 10 (all ships)	-	30
13 SMOKE SCREENS		
Target behind chemical screen	-	16
Target behind funnel smoke	-	6
14 VISIBILITY		
DURING DAYLIGHT		
Code 9 (Exceptionally Clear)	+	4
Code 8 (Very Clear)		0
Code 7 (Clear)	-	4
Code 5 or 6 (Haze)	-	8
Patchy fog	-	16
MORNING/EVENING TWILIGHT		
Target afire or silhouetted	+	2
Target in darkness	-	10
None of above	-	4
NIGHT		
No moonlight	-	18
Moonlight	-	9
Target afire or silhouetted	+	2
Target illuminated by searchlight		0
Target using a searchlight	-	4
Target in a starshell pattern	-	2

PROCEED TO **CHART 11** TO DETERMINE NUMBER OF HITS

11

SURFACE GUNFIRE COMBAT RESOLUTION

NUMBER OF SHELLS	HITS	01-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140
1	1	01-01	01-02	01-03	01-04	01-05	01-06	01-07	01-08	01-09	01-10	01-11	01-12	01-13	01-14
2	1	01-02	01-04	01-06	01-08	01-10	01-12	01-14	02-15	02-17	02-19	02-21	02-23	03-24	03-26
	2	-----	-----	-----	-----	-----	-----	-----	01-01	01-01	01-01	01-01	01-01	01-02	01-02
3	1	01-03	01-06	01-09	01-12	02-14	02-17	02-20	03-22	03-25	04-27	04-30	05-32	06-34	06-36
	2	-----	-----	-----	-----	01-01	01-01	01-01	01-02	01-02	01-03	01-03	01-04	01-05	01-05
4	1	01-04	01-08	02-11	02-15	02-19	03-22	04-25	04-28	05-31	06-34	07-37	08-40	09-43	12-45
	2	-----	-----	01-01	01-01	01-01	01-02	01-03	01-03	01-04	01-05	01-06	02-07	02-08	02-11
	3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	01-01	01-01	01-01
5	1	01-05	01-10	02-14	02-18	03-23	04-27	05-30	06-34	08-38	09-41	11-44	12-47	14-50	17-56
	2	-----	-----	01-01	01-01	01-02	01-03	01-04	01-05	02-07	02-08	02-10	02-11	03-13	03-15
	3	-----	-----	-----	-----	-----	-----	-----	-----	01-01	01-01	01-01	01-01	01-02	01-02
6	1	01-06	02-11	02-17	03-22	04-26	06-31	07-35	09-39	11-43	12-47	14-50	17-53	19-57	21-60
	2	-----	01-01	01-01	01-02	01-03	01-05	02-06	02-08	02-10	03-11	03-13	04-16	04-18	05-20
	3	-----	-----	-----	-----	-----	-----	01-01	01-01	01-01	01-02	01-02	01-03	01-03	01-04
7	1	01-07	02-13	03-19	04-25	05-30	07-35	09-40	11-44	14-48	16-52	19-56	21-59	24-62	27-65
	2	-----	01-01	01-02	01-03	01-04	02-06	02-08	02-10	03-13	04-15	04-18	05-20	06-23	07-26
	3	-----	-----	-----	-----	-----	01-01	01-01	01-01	01-02	01-03	01-03	02-04	02-05	02-06
	4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	01-01	01-01	01-01
8	1	01-08	02-15	03-22	05-28	07-34	09-39	11-44	14-49	17-53	20-57	23-61	26-64	29-67	32-70
	2	-----	01-01	01-02	01-04	02-06	02-08	02-10	03-13	04-16	05-19	06-22	07-25	08-28	10-31
	3	-----	-----	-----	-----	01-01	01-01	01-01	01-02	01-03	02-04	02-05	02-06	02-07	03-09
	4	-----	-----	-----	-----	-----	-----	-----	-----	-----	01-01	01-01	01-01	01-01	01-02
9	1	01-09	02-17	04-24	06-31	08-37	11-43	14-48	17-53	20-57	24-61	27-65	31-68	34-71	38-74
	2	-----	01-01	01-03	01-05	02-07	02-10	03-13	04-16	05-19	06-23	08-26	09-30	11-33	13-37
	3	-----	-----	-----	-----	01-01	01-01	01-02	01-03	02-04	02-05	02-07	03-08	03-10	04-12
	4	-----	-----	-----	-----	-----	-----	-----	-----	01-01	01-01	01-01	01-02	01-02	01-03
10	1	01-10	03-18	04-26	07-34	10-40	13-46	16-52	20-57	24-61	27-65	31-69	35-72	39-75	43-78
	2	-----	01-02	01-03	02-06	02-09	03-12	04-15	05-19	06-23	08-26	10-30	12-34	14-38	16-42
	3	-----	-----	-----	01-01	01-01	01-02	01-03	02-04	02-05	02-07	03-09	03-11	04-13	05-15
	4	-----	-----	-----	-----	-----	-----	-----	01-01	01-01	01-01	01-02	01-02	01-03	01-04

1 TARGET SIZE			
01 to 40 DP	+	2	
41 to 80 DP	+	4	
81 to 200 DP	+	6	
201 to 500 DP	+	8	
501 to 1000 DP	+	10	
Over 1000 DP	+	12	
2 BEARING FROM TARGET			
Position A (0 to 15 degrees)		0	
Position B (16 to 45 degrees)	+	12	
Position C (46 to 90 degrees)	+	22	
3 SEA STATE			
Beaufort 0 to 6		0	
Beaufort 7 (ships under 200 DP)	-	4	
Beaufort 8 (ships under 400 DP)	-	8	
Beaufort 9 (ships under 600 DP)	-	12	
Beaufort 10 (all ships)	-	20	
4 FIRING SHIP UNDER FIRE			
Hit during last turn	-	4	
5 OVER CONCENTRATION			
1 ship only firing at target		0	
2 to 3 ships firing at target	-	3	
4 or more ships firing at target	-	6	
6 FIRE CONTROL SYSTEM			
Post 1930 DCT System	+	48	
Post 1930 Local RF	+	35	
1914-30 DCT System	+	28	
1914-30 Top RF	+	23	
1914-30 Local RF	+	16	
1900-1919 Top RF	+	10	
1900-1919 Local RF	+	6	
1880-99 Top spot	+	2	
1880-99 Local spot	-	2	
7 RADAR ASSISTED FIRE CONTROL			
1939-42 FC Radars	+	25	
1942-44 FC Radars	+	40	
1944-45 FC Radars	+	54	
8 SPOTTER AIRCRAFT			
Aircraft spotting shell splashes	+	16	
9 SMOKE SCREENS			
Target behind chemical screen	-	16	
Target behind funnel smoke	-	6	
10 EVASIVE MANEUVER			
Target only in evasive maneuver	-	5	
Firing ship only in evasive maneuver	-	10	
Both ships in evasive maneuver	-	15	
11 VISIBILITY			
DURING DAYLIGHT			
Code 9 (Exceptionally Clear)	+	4	
Code 8 (Very Clear)		0	
Code 7 (Clear)	-	4	
Code 5 or 6 (Haze)	-	8	
Patchy fog	-	16	
MORNING/EVENING TWILIGHT			
Target afire or silhouetted	+	2	
Target in darkness	-	10	
None of above	-	4	
NIGHT			
No moonlight	-	18	
Moonlight	-	9	
Target afire or silhouetted	+	2	
Target illuminated by searchlight		0	
Target using a searchlight	-	4	
Target in a starshell pattern	-	2	
12 ACQUIRED FIRE			
Same target hit last turn	+	4	

PROCEED TO **CHART I1** TO DETERMINE NUMBER OF HITS

NUMBER OF SHELLS	HITS	01-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120	121-130	131-140
1	1	01-01	01-02	01-03	01-04	01-05	01-06	01-07	01-08	01-09	01-10	01-11	01-12	01-13	01-14
	2	-----	-----	-----	-----	-----	-----	-----	01-01	01-01	01-01	01-01	01-01	01-02	01-02
3	1	01-03	01-06	01-09	01-12	02-14	02-17	02-20	03-22	03-25	04-27	04-30	05-32	06-34	06-36
	2	-----	-----	-----	-----	01-01	01-01	01-01	01-02	01-02	01-03	01-03	01-04	01-05	01-05
4	1	01-04	01-08	02-11	02-15	02-19	03-22	04-25	04-28	05-31	06-34	07-37	08-40	09-43	12-45
	2	-----	-----	01-01	01-01	01-01	01-02	01-03	01-03	01-04	01-05	01-06	02-07	02-08	02-11
	3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	01-01	01-01	01-01
5	1	01-05	01-10	02-14	02-18	03-23	04-27	05-30	06-34	08-38	09-41	11-44	12-47	14-50	17-56
	2	-----	-----	01-01	01-01	01-02	01-03	01-04	01-05	02-07	02-08	02-10	02-11	03-13	03-15
	3	-----	-----	-----	-----	-----	-----	-----	-----	01-01	01-01	01-01	01-01	01-02	01-02
6	1	01-06	02-11	02-17	03-22	04-26	06-31	07-35	09-39	11-43	12-47	14-50	17-53	19-57	21-60
	2	-----	01-01	01-01	01-02	01-03	01-05	02-06	02-08	02-10	03-11	03-13	04-16	04-18	05-20
	3	-----	-----	-----	-----	-----	-----	01-01	01-01	01-01	01-02	01-02	01-03	01-03	01-04
7	1	01-07	02-13	03-19	04-25	05-30	07-35	09-40	11-44	14-48	16-52	19-56	21-59	24-62	27-65
	2	-----	01-01	01-02	01-03	01-04	02-06	02-08	02-10	03-13	04-15	04-18	05-20	06-23	07-26
	3	-----	-----	-----	-----	-----	01-01	01-01	01-01	01-02	01-03	01-03	02-04	02-05	02-06
	4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	01-01	01-01	01-01
8	1	01-08	02-15	03-22	05-28	07-34	09-39	11-44	14-49	17-53	20-57	23-61	26-64	29-67	32-70
	2	-----	01-01	01-02	01-04	02-06	02-08	02-10	03-13	04-16	05-19	06-22	07-25	08-28	10-31
	3	-----	-----	-----	-----	01-01	01-01	01-01	01-02	01-03	02-04	02-05	02-06	02-07	03-09
	4	-----	-----	-----	-----	-----	-----	-----	-----	-----	01-01	01-01	01-01	01-01	01-02
9	1	01-09	02-17	04-24	06-31	08-37	11-43	14-48	17-53	20-57	24-61	27-65	31-68	34-71	38-74
	2	-----	01-01	01-03	01-05	02-07	02-10	03-13	04-16	05-19	06-23	08-26	09-30	11-33	13-37
	3	-----	-----	-----	-----	01-01	01-01	01-02	01-03	02-04	02-05	02-07	03-08	03-10	04-12
	4	-----	-----	-----	-----	-----	-----	-----	-----	01-01	01-01	01-01	01-02	01-02	01-03
10	1	01-10	03-18	04-26	07-34	10-40	13-46	16-52	20-57	24-61	27-65	31-69	35-72	39-75	43-78
	2	-----	01-02	01-03	02-06	02-09	03-12	04-15	05-19	06-23	08-26	10-30	12-34	14-38	16-42
	3	-----	-----	-----	01-01	01-01	01-02	01-03	02-04	02-05	02-07	03-09	03-11	04-13	05-15
	4	-----	-----	-----	-----	-----	-----	-----	01-01	01-01	01-01	01-02	01-02	01-03	01-04

G1 HIT LOCATION

ROLL		LOCATION			
SHORT RANGE	LONG RANGE	BB CB CA CL DD	CV		
01-08	01-30	D DECK	D FLIGHT DECK		
09-40	31-40	B SIDEBELT	H HANGAR		
41-55	41-50	C CON	C CON		
56-65	51-70	T TURRET	S ISLAND		
66-85	71-82	S SUPERSTRUCTURE	B SIDEBELT		
86-00	83-00	I DUD	I DID		

G2 SHELL DAMAGE MODIFIERS

	SHELL TYPE			
	APC	SAP	COM	HE/HC
PENETRATION FACTOR	1.0	0.7	0.4	---
DAMAGE FACTOR MODIFIER (NO PENETRATION)	1.0	1.3	1.6	2.0
DAMAGE FACTOR MODIFIER (PENETRATION)	3.0	3.5	4.0	---
PROBABILITY OF CRITICAL DAMAGE (NO PENETRATION)	*20%	*20%	*20%	*20%
PROBABILITY OF CRITICAL DAMAGE (PENETRATION)	*65%	*65%	*65%	---
PROBABILITY OF PASS-THROUGH	45%	40%	30%	0

R1 NAVAL ORDNANCE PENETRATION (AVERAGE)

GUN	CLASS	BASE DP	RANGE TO TARGET									
			0 2,500	2,600 7,500	7,600 12,500	12,600 17,500	17,600 22,500	22,600 27,500	27,600 32,500	32,600 37,500	37,600 42,500	
20.0"/45	A1	34	18.5	16.7	15.6	14.7	14.2	14.0	13.5	16.1	17.8	
18.0"/45	B1	30	17.5	15.5	14.0	13.0	12.3	11.9	11.2	13.0	14.1	
18.0"/40	B2	30	17.3	14.8	12.9	11.6	10.5	9.9	8.9	10.0	10.5	
16.0"/50	C1	26	15.8	14.1	12.9	12.1	11.5	11.3	10.7	12.6	13.8	
16.0"/45	C2	26	15.5	13.4	11.8	10.7	9.9	9.4	8.6	9.7	10.4	
15.0"/50	D1	24	15.3	13.5	12.2	11.3	10.6	10.3	9.7	11.2	12.2	
15.0"/45	D2	24	15.0	12.7	10.9	9.7	8.7	8.0	7.2	8.1	8.3	
15.0"/42	D3	24	14.8	12.3	10.2	8.9	7.8	7.0	6.2	6.7	6.7	
14.0"/50	E1	22	14.8	12.6	11.0	9.8	9.0	8.4	7.6	8.5	9.0	
14.0"/45	E2	22	14.5	12.0	10.0	8.6	7.6	7.1	6.2	6.8	6.8	
13.5"/45	F1	21	14.0	11.5	9.4	8.0	7.0	6.2	5.4	5.8	5.8	
13.5"/30	F2	21	13.2	9.7	7.1	5.3	4.1	3.3	---	---	---	
13.0"/50	G1	20	13.8	11.5	9.8	8.5	7.6	6.9	6.2	---	---	
13.0"/35	G2	20	13.0	9.3	7.4	5.7	4.5	3.7	---	---	---	
12.6"/44	H1	19	13.0	10.4	8.3	6.9	5.8	5.1	4.3	4.5	4.4	
12.0"/50	H2	18	12.8	10.4	8.5	7.3	6.3	5.6	4.9	5.3	5.2	
12.0"/45	H3	18	12.5	9.9	7.8	6.4	5.4	4.6	3.8	4.0	3.8	
12.0"/40	H4	18	12.3	9.3	7.1	5.6	4.5	3.7	---	---	---	
12.0"/35	H5	18	12.0	8.8	6.5	4.8	3.7	2.9	---	---	---	
11.0"/54	J1	16	12.0	10.2	8.7	7.6	6.9	6.4	5.7	6.4	6.6	
11.0"/50	J2	16	11.8	9.4	7.5	6.2	5.3	4.6	---	---	---	
11.0"/45	J3	16	11.5	8.9	6.9	5.5	4.4	3.7	---	---	---	
11.0"/40	J4	16	11.3	8.4	6.2	4.7	3.7	3.0	---	---	---	
10.0"/45	K1	14	10.5	7.9	6.0	4.6	3.6	2.9	---	---	---	
10.0"/40	K2	14	10.3	7.4	5.4	4.0	3.0	2.3	---	---	---	
10.0"/35	K3	14	10.0	7.0	4.9	3.5	2.6	---	---	---	---	
9.4"/45	L1	13	10.0	7.5	5.6	4.2	3.3	2.6	---	---	---	
9.4"/40	L2	13	9.8	7.0	5.1	3.7	2.7	2.1	---	---	---	
9.4"/35	L3	13	9.5	6.6	4.6	3.2	2.3	---	---	---	---	
8.0"/60	M1	10	9.3	7.5	6.1	5.1	4.3	3.8	3.3	3.5	3.4	
8.0"/55	M2	10	9.0	7.0	5.4	4.3	3.4	2.9	2.4	2.4	2.2	
8.0"/50	M3	10	8.8	6.5	4.9	3.7	2.9	2.3	1.9	1.7	---	
8.0"/45	M4	10	8.5	6.1	4.4	3.3	2.4	1.9	1.5	1.2	---	
8.0"/40	M5	10	8.3	5.7	4.0	2.9	2.1	1.6	---	---	---	
8.0"/35	M6	10	8.0	5.3	3.6	2.5	1.8	1.3	---	---	---	
7.5"/50	N1	9	8.3	6.1	4.5	3.4	2.6	2.0	1.6	---	---	
7.5"/45	N2	9	8.0	5.7	4.1	3.0	2.2	1.7	1.3	---	---	
6.0"/55	P1	7	7.0	5.2	3.9	3.0	2.4	2.1	1.9	---	---	
6.0"/50	P2	7	6.8	4.8	3.4	2.5	1.9	1.5	1.3	---	---	
6.0"/45	P3	7	6.5	4.4	3.1	2.2	1.6	1.2	1.1	---	---	
6.0"/40	P4	7	6.3	4.1	2.7	1.9	1.4	1.0	---	---	---	
6.0"/30	P5	7	5.6	3.5	2.2	1.4	1.0	---	---	---	---	
5.5"/50	Q1	6	6.3	4.3	3.1	2.2	1.6	1.3	1.1	---	---	
5.25"/50	R1	6	5.9	4.1	2.8	2.0	1.5	1.2	---	---	---	
5.0"/55	S1	5	6.0	4.3	3.1	2.3	1.8	1.4	1.3	---	---	
5.0"/50	S2	5	5.8	3.9	2.7	2.0	1.5	1.1	1.0	---	---	
5.0"/45	S3	5	5.5	3.6	2.4	1.7	1.2	1.0	---	---	---	
5.0"/40	S4	5	5.3	3.3	2.2	1.5	1.1	1.0	---	---	---	
5.0"/25	S5	5	4.5	2.5	1.5	1.0	1.0	1.0	---	---	---	
4.0"/65	T1	4	5.5	4.0	2.9	2.1	1.7	1.2	---	---	---	
4.0"/50	T2	4	4.8	3.1	2.1	1.5	1.1	---	---	---	---	
4.0"/45	T3	4	4.5	2.8	1.9	1/3	1.0	---	---	---	---	
4.0"/40	T4	4	4.3	2.6	1.7	1.1	1.0	---	---	---	---	
3.0"/50	U1	3	3.8	2.4	1.6	1.1	1.0	---	---	---	---	
3.0"/45	U2	3	3.5	2.1	1.4	1.0	---	---	---	---	---	
3.0"/40	U3	3	3.2	1.8	1.1	1.0	---	---	---	---	---	
SMALLER	X1	1	1.8	1.2	1.0	---	---	---	---	---	---	

G3 RATE OF FIRE BY RANGE

RANGE TO TARGET	MAXIMUM RATE OF FIRE (PER GUN PER 2 MINUTES)
2,500 yards or less	10
2,600 to 5,000 yards	8
5,100 to 10,000 yards	6
10,100 to 17,500 yards	4
17,600 to 24,000 yards	3
24,100 to 30,000 yards	2
3,100 yards or more	1

G4 SHIPBOARD FIRES

ROLL	CHANGE IN STATUS OF FIRE
01-20	-4 from severity
21-35	-2 from severity
36-50	-1 from severity
51-75	No change
76-85	+1 to severity
86-99	+2 to severity
00	Fire OOC (abandon ship)
A shipboard fire will occur if two of the same number are rolled during the roll to see if the hit caused Critical Damage. The severity of the fire is determined by the total of the two dice (00 being counted as 20). Each turn (2 minutes) a Damage Control Roll must be made to determine the status of the fire.	

U3 TURNING RADIUS

DP OF SHIP	MAXIMUM TURN ALLOWED IN 2 MINUTES
25-199	180 degrees
200-899	135 degrees
900 +	90 degrees
All turns are made using segments no greater than 45-degrees.	

G1 HIT LOCATION

ROLL		LOCATION					
SHORT RANGE	LONG RANGE	BB	CB	CA	CL	DD	CV
01-08	01-30	D	DECK				D FLIGHT DECK
09-40	31-40	B	SIDEBELT				H HANGAR
41-55	41-50	C	CON				C CON
56-65	51-70	T	TURRET				S ISLAND
66-85	71-82	S	SUPERSTRUCTURE				B SIDEBELT
86-00	83-00	I	DUD				I DID

G2 SHELL DAMAGE MODIFIERS

	SHELL TYPE			
	APC	SAP	COM	HE/HC
PENETRATION FACTOR	1.0	0.7	0.4	---
DAMAGE FACTOR MODIFIER (NO PENETRATION)	1.0	1.3	1.6	2.0
DAMAGE FACTOR MODIFIER (PENETRATION)	3.0	3.5	4.0	---
PROBABILITY OF CRITICAL DAMAGE (NO PENETRATION)	*20%	*20%	*20%	*20%
PROBABILITY OF CRITICAL DAMAGE (PENETRATION)	*65%	*65%	*65%	---
PROBABILITY OF PASS-THROUGH	45%	40%	30%	0

R2 NAVAL ORDNANCE PENETRATION (VERTICAL/HORIZONTAL)

GUN	CLASS	BASE DP	RANGE TO TARGET									
			0 2,500	2,600 7,500	7,600 12,500	12,600 17,500	17,600 22,500	22,600 27,500	27,600 32,500	32,600 37,500	37,600 42,500	
20.0"/45	A1	34	36.0 0	32.4 0	29.2 1.9	26.2 3.1	23.6 4.7	21.2 6.8	19.1 7.8	17.2 14.9	15.5 20.1	
18.0"/45	B1	30	34.0 0	29.9 0	26.3 1.7	23.2 2.8	20.4 4.1	17.9 5.8	15.8 6.5	13.9 12.1	12.2 15.9	
18.0"/45	B2	30	33.5 0	28.5 0	24.2 1.6	20.6 2.5	17.5 3.5	14.9 4.8	12.6 5.2	10.7 9.3	9.1 11.8	
16.0"/50	C1	26	30.5 0	27.1 0	24.2 1.6	21.5 2.6	19.1 3.8	17.0 5.5	15.2 6.2	13.5 11.7	12.0 15.6	
16.0"/45	C2	26	30.0 0	25.8 0	22.2 1.4	19.1 2.3	16.4 3.3	14.1 4.6	12.1 5.0	10.4 9.0	9.0 11.7	
15.0"/50	D1	24	29.5 0	25.9 0	22.8 1.5	20.1 2.4	17.7 3.5	15.6 5.0	13.7 5.6	12.0 10.4	10.6 13.8	
15.0"/45	D2	24	29.0 0	24.4 0	20.5 1.3	17.2 2.1	14.4 2.9	12.1 3.9	10.2 4.2	8.6 7.5	7.2 9.4	
15.0"/42	D3	24	28.6 0	23.5 0	19.2 1.2	15.8 1.9	12.9 2.6	10.6 3.4	8.7 3.6	7.1 6.2	5.8 7.5	
14.0"/50	E1	22	28.5 0	24.2 0	20.6 1.3	17.5 2.1	14.9 3.0	12.6 4.1	10.7 4.4	9.1 7.9	7.8 10.1	
14.0"/45	E2	22	28.0 0	23.0 0	18.8 1.2	15.4 1.8	12.6 2.5	10.7 3.4	8.8 3.6	7.2 6.3	5.9 7.7	
13.5"/45	F1	21	27.0 0	21.9 0	17.7 1.1	14.3 1.7	11.6 2.3	9.4 3.0	7.6 3.1	6.2 5.4	5.0 6.5	
13.5"/30	F2	21	25.5 0	18.4 0	13.2 0	9.5 1.1	6.8 1.4	4.9 1.6	----	----	----	
13.0"/50	G1	20	26.5 0	22.0 0	18.3 1.2	15.2 1.8	12.6 2.5	10.4 3.4	8.7 3.6	----	----	
13.0"/35	G2	20	25.0 0	18.5 0	13.7 0	10.1 1.2	7.5 1.5	5.5 1.8	----	----	----	
12.6"/44	H1	19	25.0 0	19.8 0	15.6 1.0	12.3 1.5	9.7 1.9	7.7 2.5	6.1 2.5	4.8 4.2	3.8 4.9	
12.0"/50	H2	18	24.5 0	19.8 0	16.0 1.0	13.0 1.6	10.5 2.1	8.5 2.7	6.9 2.8	5.6 4.9	4.5 5.9	
12.0"/45	H3	18	24.0 0	18.7 0	14.6 0	11.4 1.4	8.9 1.8	6.9 2.2	5.4 2.4	4.2 3.7	3.3 4.3	
12.0"/40	H4	18	23.5 0	17.6 0	13.2 0	9.9 1.2	7.4 1.5	5.6 1.8	----	----	----	
12.0"/35	H5	18	23.0 0	16.6 0	11.9 0	8.6 1.0	6.2 1.2	4.4 1.4	----	----	----	
11.0"/54	J1	16	23.0 0	19.3 0	16.2 1.1	13.6 1.6	11.5 2.3	9.6 3.1	8.1 3.3	6.8 5.9	5.7 7.4	
11.0"/50	J2	16	22.5 0	17.8 0	14.0 0	11.1 1.3	8.8 1.8	6.9 2.2	----	----	----	
11.0"/45	J3	16	22.0 0	16.7 0	12.7 0	9.7 1.2	7.3 1.5	5.6 1.8	----	----	----	
11.0"/40	J4	16	21.5 0	15.7 0	11.4 0	8.4 1.0	6.1 1.2	4.5 1.5	----	----	----	
10.0"/45	K1	14	20.0 0	14.8 0	11.0 0	8.1 1.0	6.0 1.2	4.4 1.4	----	----	----	
10.0"/40	K2	14	19.5 0	13.8 0	9.8 0	7.0 0	4.9 0	3.5 1.1	----	----	----	
10.0"/35	K3	14	19.0 0	12.9 0	8.8 0	6.0 0	4.1 0	----	----	----	----	
9.4"/45	L1	13	19.0 0	13.9 0	10.1 0	7.4 0	5.4 1.1	3.9 1.3	----	----	----	
9.4"/40	L2	13	18.5 0	13.0 0	9.1 0	6.3 0	4.4 0	3.1 1.0	----	----	----	
9.4"/35	L3	13	18.0 0	12.1 0	8.1 0	5.4 0	3.6 0	----	----	----	----	
8.0"/60	M1	10	17.5 0	14.0 0	11.2 0	9.0 1.1	7.2 1.4	5.7 1.8	4.6 1.9	3.7 3.2	2.9 3.8	
8.0"/55	M2	10	17.0 0	12.9 0	9.8 0	7.5 0	5.7 1.1	4.3 1.4	3.3 1.5	2.5 2.2	1.9 2.5	
8.0"/50	M3	10	16.5 0	12.0 0	8.8 0	6.4 0	4.7 0	3.4 1.1	2.5 1.2	1.8 1.6	----	
8.0"/45	M4	10	16.0 0	11.2 0	7.8 0	5.5 0	3.8 0	2.7 0	1.9 0	1.3 1.1	----	
8.0"/40	M5	10	15.5 0	10.4 0	6.9 0	4.7 0	3.1 0	2.1 0	----	----	----	
8.0"/35	M6	10	15.0 0	9.6 0	6.1 0	3.9 0	2.5 0	1.6 0	----	----	----	
7.5"/50	N1	9	15.5 0	11.2 0	8.0 0	5.8 0	4.2 0	3.0 1.0	2.2 1.0	----	----	
7.5"/45	N2	9	15.0 0	10.4 0	7.1 0	4.9 0	3.4 0	2.3 0	1.6 0	----	----	
6.0"/55	P1	7	13.0 0	9.4 0	6.7 0	4.8 1.1	3.5 1.3	2.5 1.6	1.8 2.0	----	----	
6.0"/50	P2	7	12.5 0	8.5 0	5.8 0	3.9 0	2.7 1.0	1.8 1.2	1.2 1.3	----	----	
6.0"/45	P3	7	12.0 0	7.8 0	5.1 0	3.3 0	2.1 0	1.4 0	1.0 1.1	----	----	
6.0"/40	P4	7	11.5 0	7.1 0	4.4 0	2.7 0	1.7 0	1.0 0	----	----	----	
6.0"/30	P5	7	10.5 0	5.9 0	3.3 0	1.8 0	1.0 0	----	----	----	----	
5.5"/50	Q1	6	11.5 0	7.6 0	5.1 0	3.4 0	2.2 0	1.5 1.0	1.0 1.1	----	----	
5.25"/50	R1	6	10.8 0	7.1 0	4.6 0	3.0 0	2.0 0	1.3 0	----	----	----	
5.0"/55	S1	5	11.0 0	7.6 0	5.2 0	3.6 0	2.5 0	1.7 1.1	1.2 1.3	----	----	
5.0"/50	S2	5	10.5 0	6.8 0	4.4 0	2.9 0	1.9 0	1.2 0	1.0 0	----	----	
5.0"/45	S3	5	10.0 0	6.2 0	3.8 0	2.4 0	1.4 0	1.0 0	----	----	----	
5.0"/40	S4	5	9.5 0	5.6 0	3.3 0	2.0 0	1.2 0	----	----	----	----	
5.0"/25	S5	5	8.0 0	4.0 0	2.0 0	1.0 0	1.0 0	----	----	----	----	
4.0"/65	T1	4	10.0 0	6.9 0	4.8 0	3.3 0	2.3 0	----	----	----	----	
4.0"/50	T2	4	8.5 0	5.2 0	3.2 0	1.9 0	1.2 0	----	----	----	----	
4.0"/45	T3	4	8.0 0	4.6 0	2.7 0	1.6 0	1.0 0	----	----	----	----	
4.0"/40	T4	4	7.5 0	4.1 0	2.3 0	1.2 0	1.0 0	----	----	----	----	
3.0"/50	U1	3	6.5 0	3.7 0	2.1 0	1.2 0	1.0 0	----	----	----	----	
3.0"/45	U2	3	6.0 0	3.2 0	1.7 0	1.0 0	----	----	----	----	----	
3.0"/40	U3	3	5.3 0	2.6 0	1.2 0	1.0 0	----	----	----	----	----	
SMALLER	X1	1	2.5 0	1.3 0	1.0 0	----	----	----	----	----	----	

SEEKRIEG 4 CHARTS

G3 RATE OF FIRE BY RANGE

RANGE TO TARGET	MAXIMUM RATE OF FIRE (PER GUN PER 2 MINUTES)
2,500 yards or less	10
2,600 to 5,000 yards	8
5,100 to 10,000 yards	6
10,100 to 17,500 yards	4
17,600 to 24,000 yards	3
24,100 to 30,000 yards	2
3,100 yards or more	1

G4 SHIPBOARD FIRES

ROLL	CHANGE IN STATUS OF FIRE
01-20	-4 from severity
21-35	-2 from severity
36-50	-1 from severity
51-75	No change
76-85	+1 to severity
86-99	+2 to severity
00	Fire OOC (abandon ship)
A shipboard fire will occur if two of the same number are rolled during the roll to see if the hit caused Critical Damage. The severity of the fire is determined by the total of the two dice (00 being counted as 20). Each turn (2 minutes) a Damage Control Roll must be made to determine the status of the fire.	

U3 TURNING RADIUS

DP OF SHIP	MAXIMUM TURN ALLOWED IN 2 MINUTES
25-199	180 degrees
200-899	135 degrees
900 +	90 degrees
All turns are made using segments no greater than 45-degrees.	

N1 CLASS A CD DETERMINATION

ROLL	DECK	BELT	CON	TURRET	SUPERSTR
01-02	1	1	1	1	9
03-04	1	1	2	1	9
05-06	2	2	2	1	10
07-08	2	2	2	1	10
09-10	3	2	2	4	10
11-12	3	3	3	4	11
13-14	3	3	3	4	11
15-16	4	4	3	4	11
17-18	4	4	4	4	12
19-20	4	5	4	4	12
21-22	5	5	4	4	13
23-24	5	6	4	8	13
25-26	6	6	5	8	14
27-28	6	6	5	8	14
29-30	7	6	5	8	14
31-32	7	7	6	18	15
33-34	8	7	6	18	15
35-36	9	10	6	18	16
37-38	9	10	7	18	16
39-40	9	11	7	19	16
41-42	10	11	10	19	16
43-44	10	11	10	19	17
45-46	11	17	10	19	17
47-48	11	17	10	20	17
49-50	16	17	11	20	21
51-52	16	18	11	20	21
53-54	17	18	11	20	21
55-56	17	19	17	20	22
57-58	18	19	17	26	22
59-60	18	23	17	26	24
61-62	19	23	18	26	24
63-64	20	23	18	26	25
65-66	22	36	19	28	25
67-68	22	36	21	28	26
69-70	28	36	21	28	26
71-72	28	36	21	33	26
73-74	29	36	22	33	27
75-76	29	38	22	35	27
77-78	30	38	23	35	28
79-80	32	38	23	35	28
81-82	34	39	36	35	28
83-84	35	39	36	35	29
85-86	36	40	36	35	29
87-88	36	40	38	35	30
89-90	37	40	38	37	30
91-92	37	40	39	37	31
93-94	38	42	39	37	32
95-96	38	42	41	39	32
97-98	38	50	41	41	33
99-00	39	50	41	41	34

PROCEED TO CHART N4 FOR DESCRIPTION OF DAMAGE

N5 CD DURATION

ROLL	DURATION OF CRITICAL DAMAGE
01-10	2 minutes (1 turn)
11-20	4 minutes (2 turns)
21-30	6 minutes (3 turns)
31-40	10 minutes (5 turns)
41-50	16 minutes (8 turns)
51-60	24 minutes (12 turns)
61-70	30 minutes (15 turns)
71-80	60 minutes (30 turns)
81-00	PERMANENT

N4 CRITICAL DAMAGE EFFECTS

1	Magazine explosion - ship is destroyed and removed from playing area at end of game turn.
2	Engine room damaged - reduce maximum speed by 1/4 of original maximum speed for the next [X] turns.
3	Engine room destroyed - reduce maximum speed by 1/2 of original maximum speed permanently.
4	Magazine fire (roll to determine PRIMARY or SECONDARY battery and roll again to determine location of battery magazine affected - FORWARD/CENTER/AFT or PORT/STARBOARD). Multiply DP caused by this hit by 3 and add this to total. For the next 3 game turns roll dice to determine progress of firefighting; 01-59 FLOODING SUCCESSFUL 60-79 ADDITIONAL DAMAGE - ADD DP CAUSED BY ORIGINAL HIT AGAIN 80-00 FIRE GOES OOC AND SHIP DESTROYED BY MAGAZINE EXPLOSION. Regardless of the rolls (made at the end of the next 3 turns), all guns being serviced by this magazine may not fire for the remainder of the battle.
5	Fire in engine room - reduce maximum speed by 2 knots each turn for the next [X] turns and remain at the final reduced speed an equal number of turns before increasing speed.
6	Magazine flooded - Guns serviced by this magazine may fire for the next 3 turns and may not fire again for the remainder of the battle (roll to determine battery affected and location of flooding as in #4).
7	Flooding in fireroom - multiply DP caused by this hit by 2 and add this to total. Reduce maximum speed by 1/4 of original maximum speed permanently.
8	One turret of gunmount OOA for [X] turns (roll to determine which battery PRIMARY/SECONDARY, and roll again to determine location of turret or gunmount affected).
9	One TT mount, DC mount, or AA mount OOA for [X] turns (roll to determine type of mount and roll again to determine location of mount affected).
10	Steerage OOA for [X] turns - maximum turn reduced to half of normal per game turn. No EM possible.
11	Steerage jammed for [X] turns - ship must continue on same course as this game turn and reduce speed to no more than 16 knots. No EM possible.
12	Searchlight destroyed (roll to determine location of destroyed light).
13	Signal bridge OOA for [X] turns - no visual communications with other ships in company.
14	Radio room OOA for [X] turns - no radio communications possible.
15	Funnel damage - when firing guns abaft of forward-most funnel without radar assist, reduce the total from CHART H by 4 for each gun. Reduce speed by 4 knots permanently.
16	Aircraft stowage hit - multiply DP caused by this hit by 2 and add this to total. Automatic shipboard fire of severity 10. Catapult and all aircraft aboard destroyed. If ship not carrying catapult, use CD #9.
17	Aux. Steering destroyed - if ship affected by CD #10 or #11 during battle then it has no steerage and must reduce speed to no more than 10 knots and retreat from action. Maximum turning capability is then 1/4 that of the normal capability of the ship per game turn. Until affected by 10 or 11, this has no effect
18	Ammo hoist in one turret or gunmount OOA for [X] turns - reduce MAXIMUM ROF by 50% in the affected turret (roll to determine which battery PRIMARY/SECONDARY and roll again to determine location of mount).
19	Handling room OOA for [X] turns - reduce MAXIMUM ROF by 50% for all mounts serviced by this magazine (roll to determine which battery PRIMARY/SECONDARY and roll again to determine location of affected magazine FORWARD/CENTER/AFT or PORT/STARBOARD).
20	One turret or gunmount destroyed (roll to determine which battery PRIMARY/SECONDARY and roll again to determine location of mount destroyed).
21	Service to 25% of AA battery OOA for [X] turns - reduce AA Factor by 25% for affected battery. If ship has no AA battery, then use CD #15.
22	Service to 10% of AA battery OOA for [X] turns - reduce AA Factor by 10% in affected battery. If ship has no AA battery, then use CD #12.
23	Fuel bunker hit - double fuel consumption (half the remaining cruising radius) during search. If oil fuel, ship will leave trail each remaining game turn which will be visible for 24 hours. Automatic shipboard fire, severity 8 for both coal and oil fuel ships.
24	Sonar/Asdic destroyed - no underwater detection capabilities. If ship has no Sonar or Asdic, then use CD #14.
25	Sonar/Asdic OOA for [X] turns - as CD #24.
26	Fire control radar OOA for [X] turns (roll to determine which battery PRIMARY/SECONDARY/AA). If no radar, then use CD #28.

27	Fire control radar destroyed - as #26 except permanent. If no radar, then use CD #29.
28	Fire control director OOA for [X] turns (roll to determine which battery PRIMARY/SECONDARY/AA is affected and roll again to determine location of guns being serviced by director). No DCT bonus for all guns serviced by director for duration of CD. If no DCT, then reduce total from CHART H by 6.
29	Fire control director destroyed - as #28 except permanent.
30	Surface search radar OOA for [X] turns - use visual sighting during search. If no radar, then reduce visual sighting range by 20% during search.
31	Surface search radar destroyed - as #30 except permanent.
32	Air search radar OOA for [X] turns - use visual detection on CHART M1. If no radar, then reduce visual sighting range by 20% during search.
33	Air search radar destroyed - as #32 except permanent.
34	Rangefinder destroyed - if using visual fire control, reduce total from CHART H by 6 for battery being serviced by this RF.
35	Barbette of one mount jammed for [X] turns - cannot traverse or fire (determine location as in CD #18).
36	Powerplant OOA for [X] turns - all radar out, no radio communications, reduce ROF by 50% for all batteries and reduce AA (if any) by 25% for duration of effect.
37	Bridge hit - ship must continue on same course at same speed as this game turn for the next 4 game turns.
38	Structural damage - double the DP caused by this hit.
39	Severe structural damage - triple DP caused by this hit.
40	Prop/shaft damage - reduce maximum speed by 10 knots permanently.
41	Damage control party trapped for [X] turns - no damage control reduction available during turns of effect. If ship currently under the effects of a shipboard fire, then add 25 to die roll when determining fire damage control.
42	Excessive flooding - ships over 75% damaged capsize. Ships with 75% damage or under must reduce speed by 10 knots and may not commence evasive maneuver. If affected by this CD again, ship capsizes regardless of current damage.
43	Avgas storage hit - multiply damage points caused by this hit by 5 and add this to total. Automatic shipboard fire severity 16. No further launch or recovery operations possible until fire is out.
44	Ready-use ammo hit - multiply damage points caused by this hit by 4 and add this to total. Reduce AA by 25% for the next [X] turns. Automatic shipboard fire severity 10.
45	Hangar fire - roll dice to determine percentage of aircraft remaining aboard destroyed by fire. Automatic shipboard fire severity 8. No further launch or recovery operations possible until fire is out.
46	Elevator OOA for [X] turns - reduce launch and recovery operations by 50% for duration of effect.
47	Elevator destroyed - as above except permanent.
48	Launch control OOA for [X] turns - no launch or recovery operation for duration of effect.
49	Excess flooding causes severe list - as above except permanent.
50	Severe flooding - ships moving faster than 18 knots multiply damage caused by this hit by 4 and add to total. Ships moving 18 knots or slower multiply damage caused by this hit by 2 and add to total.
51	Flooding in compartments - sub must surface during any of next 3 turns.
52	Hull crushed - sub is destroyed.
53	Conning tower hit - no further offensive operations possible
54	Damage to bow TT - 50% of bow TT OOA permanently.
55	Severe damage to bow TT - all bow TT OOA permanently.
56	Damage to stern TT - as CD #54 except for stern TT.
57	Sea water in battery compartments - sub must surface next turn (regardless of depth). No offensive operations possible for next four turns on surface. No submerged operations for next 30 turns.
58	Diving planes jammed - sub must dive 100 feet per turn for the next 4 turns.
59	Diving planes jammed - sub must surface 100 feet per turn for the next 4 turns.
60	Diving planes jammed - sub must remain at current depth for the next 2 turns.
61	Sub leaking oil - sub must reveal location (not depth) to all ships within 6,000 yards as well as all aircraft for each turn.
62	Leaks in hull - sub may dive to 1/2 of its maximum depth.
63	Prop damage - sub must reduce speed to 1/2 of its maximum in order to remain undetected.
64	Slight additional structural damage - multiply damage caused by this hit by 1.5

U2 MORALE

DAMAGE SUSTAINED	ROLL REQUIRED FOR CREW TO ABANDON SHIP
65%	01-05
75%	01-08
85%	01-12
95%	01-20
100%	01-90

U4 LOSS OF RADAR

DAMAGE SUSTAINED	ROLL REQUIRED FOR LOSS OF RADAR
10%	01-30
20%	01-40
30%	01-50
40%	01-70
50%	01-90
60%	AUTOMATIC

T1 TORPEDO HIT PROBABILITY CALCULATION

$$\left(\frac{57.3 \times \text{LENGTH OF TARGET (in feet)} \times \text{SINE OF ANGLE OF BEARING FROM TARGET}}{\text{RANGE BETWEEN SHIPS (in feet)}} \right) \times \text{RELATIVE TRACKING ERROR}$$

= PROBABILITY OF HIT
WHEN COMPARED WITH
CHART T4

T2 TORPEDO RELATIVE TRACKING ERROR (RTE)

SPEED OF TARGET (KNOTS)	RELATIVE TRACKING ERROR (RTE)
0 - 4	2.4
5 - 8	4.0
9 - 12	5.6
13 - 18	7.0
19 - 24	8.0
25 - 30	9.0
31 - 36	10.0
37 +	11.6

MODIFIERS TO RTE

NORMAL CONVOY ZIG-ZAG	+ 0.5
TARGET IN EVASIVE MANEUVIR	+ 1.0
TARGET MOVES TO COMB SPREAD	+ 1.5
ACOUSTIC HOMING TORPEDO	- 3.0
PATTERN-RUNNING TORPEDO	- 1.5

T3 SINES

DEGREE OF ANGLE	SINE
1	.017
5	.087
10	.174
15	.259
20	.342
25	.423
30	.500
35	.573
40	.643
45	.707
50	.766
55	.819
60	.866
65	.906
70	.940
75	.966
80	.985
85	.996
90	1.00

T4 TORPEDO HIT PROBABILITY

RESULT FROM T1	ROLL NEEDED FOR HIT	RESULT FROM T1	ROLL NEEDED FOR HIT	RESULT FROM T1	ROLL NEEDED FOR HIT	RESULT FROM T1	ROLL NEEDED FOR HIT	RESULT FROM T1	ROLL NEEDED FOR HIT
0.01	01-01	0.25	01-20	0.49	01-38	0.73	01-53	1.14	01-75
0.02	01-02	0.26	01-20	0.50	01-38	0.74	01-54	1.16	01-75
0.03	01-02	0.27	01-21	0.51	01-39	0.75	01-55	1.18	01-76
0.04	01-03	0.28	01-22	0.52	01-40	0.76	01-55	1.20	01-77
0.05	01-04	0.29	01-23	0.53	01-40	0.77	01-56	1.24	01-78
0.06	01-05	0.30	01-24	0.54	01-41	0.78	01-56	1.28	01-80
0.07	01-06	0.31	01-24	0.55	01-42	0.79	01-57	1.32	01-81
0.08	01-06	0.32	01-25	0.56	01-42	0.80	01-58	1.36	01-83
0.09	01-07	0.33	01-26	0.57	01-43	0.82	01-59	1.40	01-84
0.10	01-08	0.34	01-27	0.58	01-44	0.84	01-60	1.44	01-85
0.11	01-09	0.35	01-27	0.59	01-44	0.86	01-61	1.48	01-86
0.12	01-10	0.36	01-28	0.60	01-45	0.88	01-62	1.52	01-87
0.13	01-10	0.37	01-29	0.61	01-46	0.90	01-63	1.56	01-88
0.14	01-11	0.38	01-30	0.62	01-46	0.92	01-64	1.60	01-89
0.15	01-12	0.39	01-30	0.63	01-47	0.94	01-65	1.64	01-90
0.16	01-13	0.40	01-31	0.64	01-48	0.96	01-66	1.68	01-91
0.17	01-14	0.41	01-32	0.65	01-48	0.98	01-67	1.75	01-92
0.18	01-14	0.42	01-33	0.66	01-49	1.00	01-68	1.80	01-93
0.19	01-15	0.43	01-33	0.67	01-50	1.02	01-69	1.85	01-94
0.20	01-16	0.44	01-34	0.68	01-50	1.04	01-70	1.90	01-94
0.21	01-17	0.45	01-35	0.69	01-51	1.06	01-71	2.00	01-95
0.22	01-17	0.46	01-35	0.70	01-52	1.08	01-72	2.10	01-96
0.23	01-18	0.47	01-36	0.71	01-52	1.10	01-73	2.20	01-97
0.24	01-19	0.48	01-37	0.72	01-53	1.12	01-75	2.40	01-98

T5 TORPEDO DUD FACTORS

COUNTRY	PERIOD	CONTACT PISTOL DUD ON ROLL OF	MAGNETIC PISTOL DUD ON ROLL OF
ALL	1880-1945 UNLESS OTHERWISE NOTED BELOW	01-15	Not Available
GREAT BRITAIN	1935 to March 1944	01-15	01-35
GREAT BRITAIN	March 1944 to 1945	01-15	01-20
GERMANY	1935 to November 1942	01-25	01-50
GERMANY	November 1942 to 1945	01-25	01-30
ITALY	1940 to 1943	01-15	01-20
JAPAN	July 1944 to 1945	01-15	01-20
RUSSIA	1942 to 1945	01-15	01-20
UNITED STATES	1935 to September 1943	01-40	01-60
UNITED STATES	September 1943 - 1945	01-15	01-20

T6 TORPEDO DAMAGE EFFECTIVENESS RATING

TARGET SHIP BELT ARMOR	TORPEDO DAMAGE CLASS					
	A	B	C	D	E	F
1.0-1.5	384	310	230	192	154	115
1.6-2.5	370	296	222	185	148	111
2.6-3.5	357	285	214	178	143	107
3.6-4.5	345	275	206	172	138	103
4.6-5.5	333	267	200	167	133	100
5.6-6.5	322	258	193	161	129	97
6.6-7.5	312	250	188	156	125	94
7.6-8.5	303	242	182	151	121	91
8.6-9.5	294	235	176	147	118	88
9.6-10.5	278	222	167	139	111	83
10.6-11.5	263	210	158	131	105	79
11.6-13.0	250	200	150	125	100	75
13.1-14.5	238	190	143	119	95	71
14.6-17.0	217	174	130	109	87	65

T7 TORPEDO DER MODIFIER

ROLL	MULTIPLY DER BY	
	CONTACT PISTOL	MAGNETIC PISTOL
01-08	0.1	0.2
09-16	0.2	0.5
17-30	0.4	1.0
31-50	0.6	1.0
51-85	1.0	1.4
86-00	1.5	1.8