

NAVY DEPARTMENT
DAVID TAYLOR MODEL BASIN
WASHINGTON, D. C.

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Operations Officer
Com An Des Bce
13 June 1969

TACTICAL CURVES FOR DESTROYERS DD692 CLASS
FROM DATA OBTAINED ON USS MOALE (DD693)
DD692-709, DD722-725, DD727-741, DD744-762,
DD770-781, and DD857

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PREPARED BY EXPERIMENTAL TOWING TANK
STEVENS INSTITUTE OF TECHNOLOGY
HOBOKEN, NEW JERSEY

August 1944

Report R-273

Exh 68

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ENCLOSURE (68)

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DESTROYERS
DD 692 CLASS

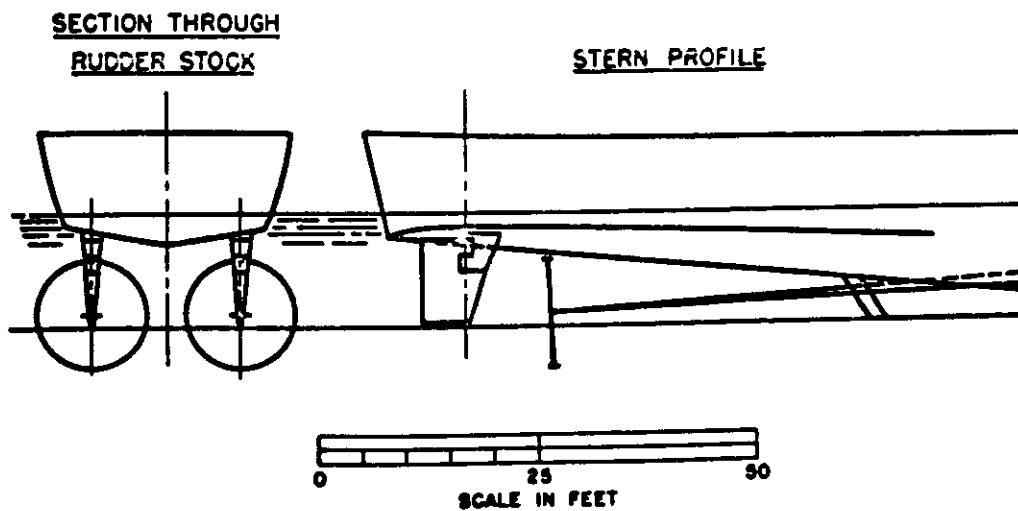
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SHIP DIMENSIONS

LENGTH BETWEEN PERPENDICULARS	369 FEET 0 INCHES
BEAM	40 FEET 10 INCHES
RUDDER AREA (EACH RUDDER)	59 SQUARE FEET

TRIAL CONDITIONS

DISPLACEMENT, MEAN	2935 TONS
DRAFT, MEAN	13 FEET 2 $\frac{3}{4}$ INCHES
TRIM	1 $\frac{1}{2}$ INCHES BY STERN



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LIST OF ILLUSTRATIONS

TACTICAL DATA

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TACTICAL CURVES - USS MOALE (DD693)
Representative of Destroyer Class DD692

The tactical curves and initial turning movement diagrams reproduced herein were derived from tests of the USS MOALE (DD693) held off Rockland, Maine, on 14 May 1944.

The curves of tactical diameter, advance, transfer, and time to swing, represent faired values for the rudder angles shown, as deduced from actual test data adjusted to these rudder angles.

The summary sheet of turning circles is based upon values taken from the faired curves.

The curves of angle of heel represent faired values of maximum heel angles encountered during the turn, usually occurring between the execute point and 45 degrees change of heading.

The diagrams of initial turning movement indicate the position of the ship at specified time intervals as the course is changed through 180 degrees. The corresponding positions of the ship, had it remained on its original course at the approach speed, are also shown and designated by corresponding figures.

Each diagram of initial turning movement represents an actual test made as nearly as possible at the nominal speed and rudder angle shown at the top of the sheet. The actual speed and rudder angle for the test are shown on the plot itself.

The speed-in-turn values represent instantaneous speeds obtained from the slope of a faired time-distance curve.

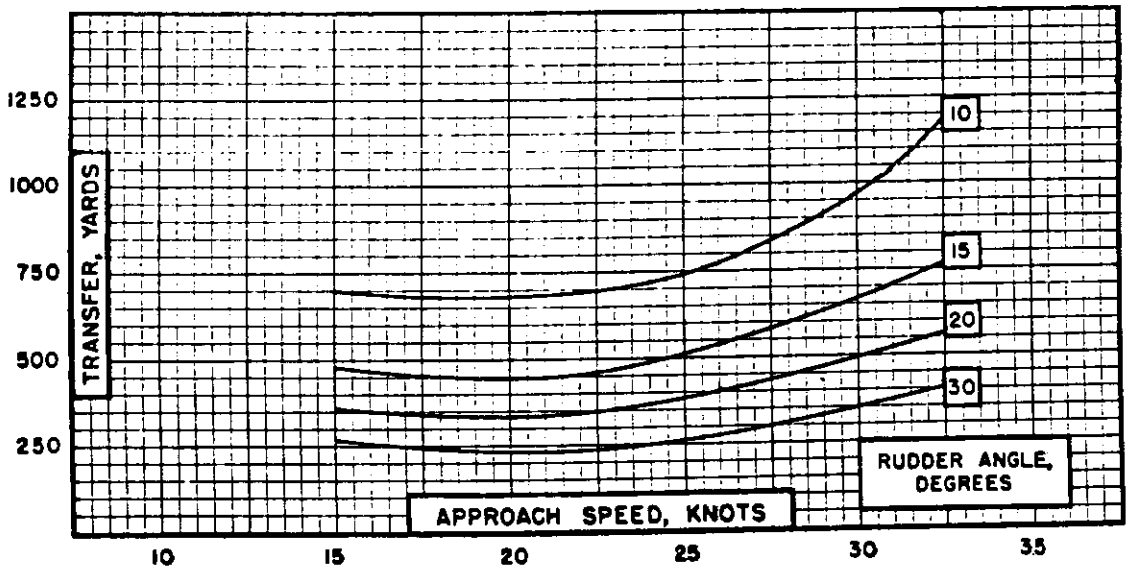
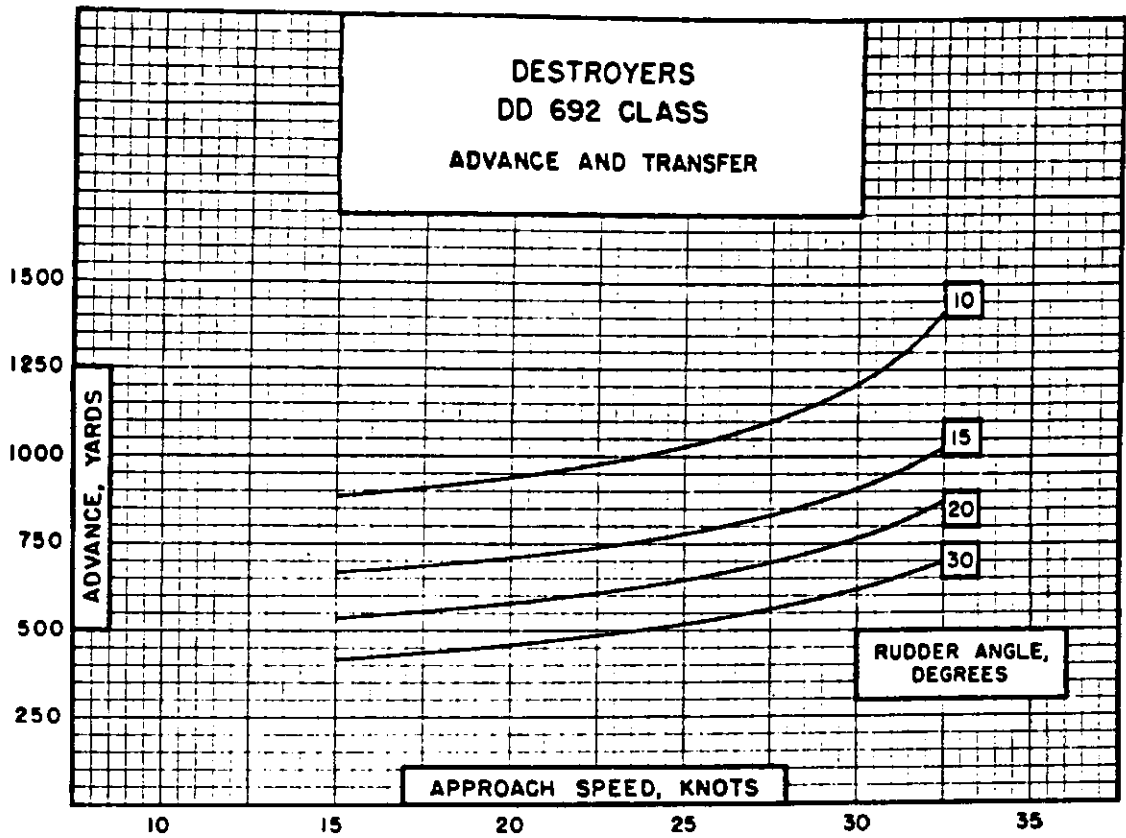
The center of the steady turning circle is indicated by the cross on the corresponding diagram.

The rudders on this ship, for this test, were set with the trailing edges converging 1 degree each. Some of the ships of this class have the rudder trailing edges diverging 4 degrees each. This difference has very little effect on the tactical data. As the rudders on this ship could not be swung beyond 30 degrees, tests could not be made up to the normal operating maximum angle of 35 degrees.

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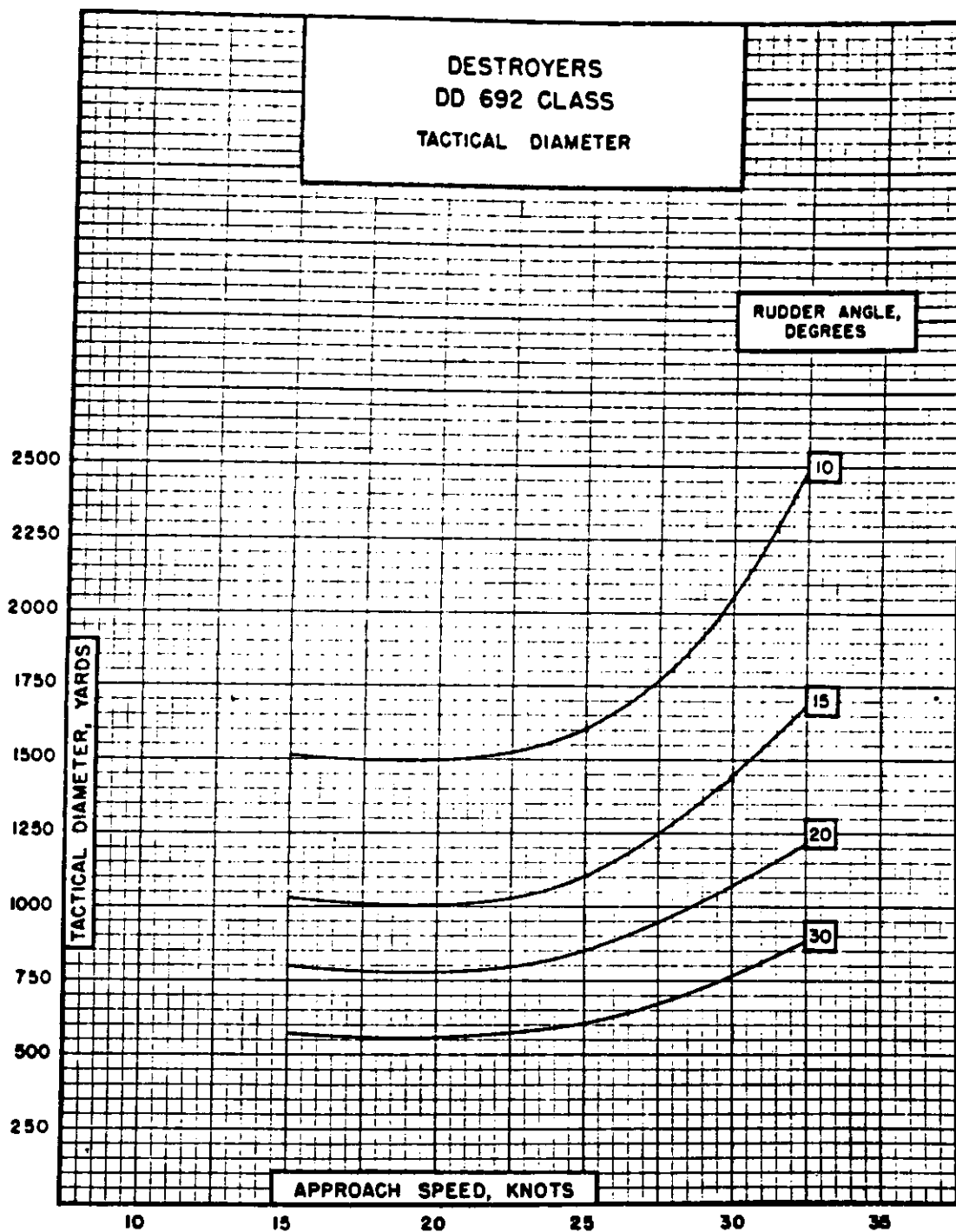
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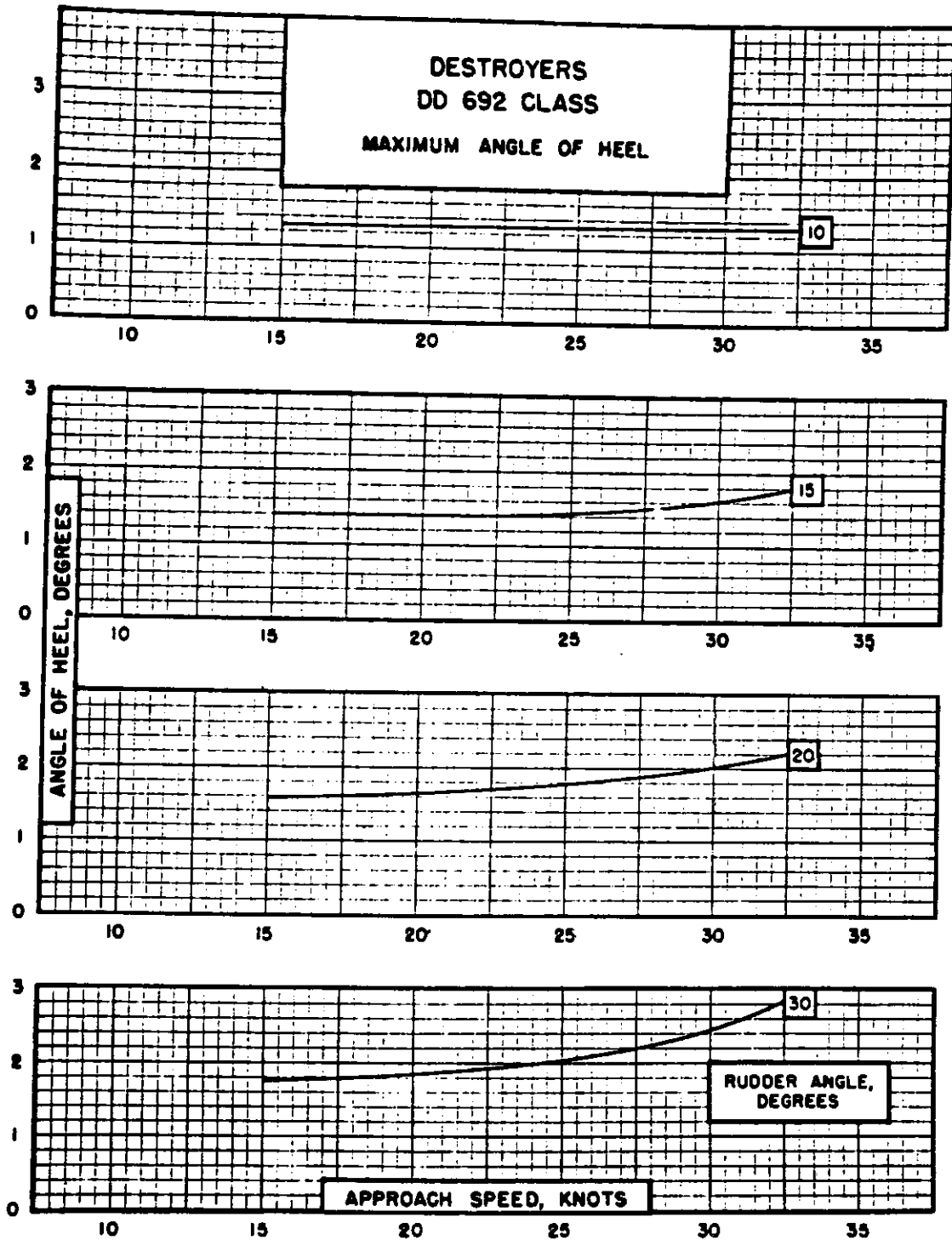
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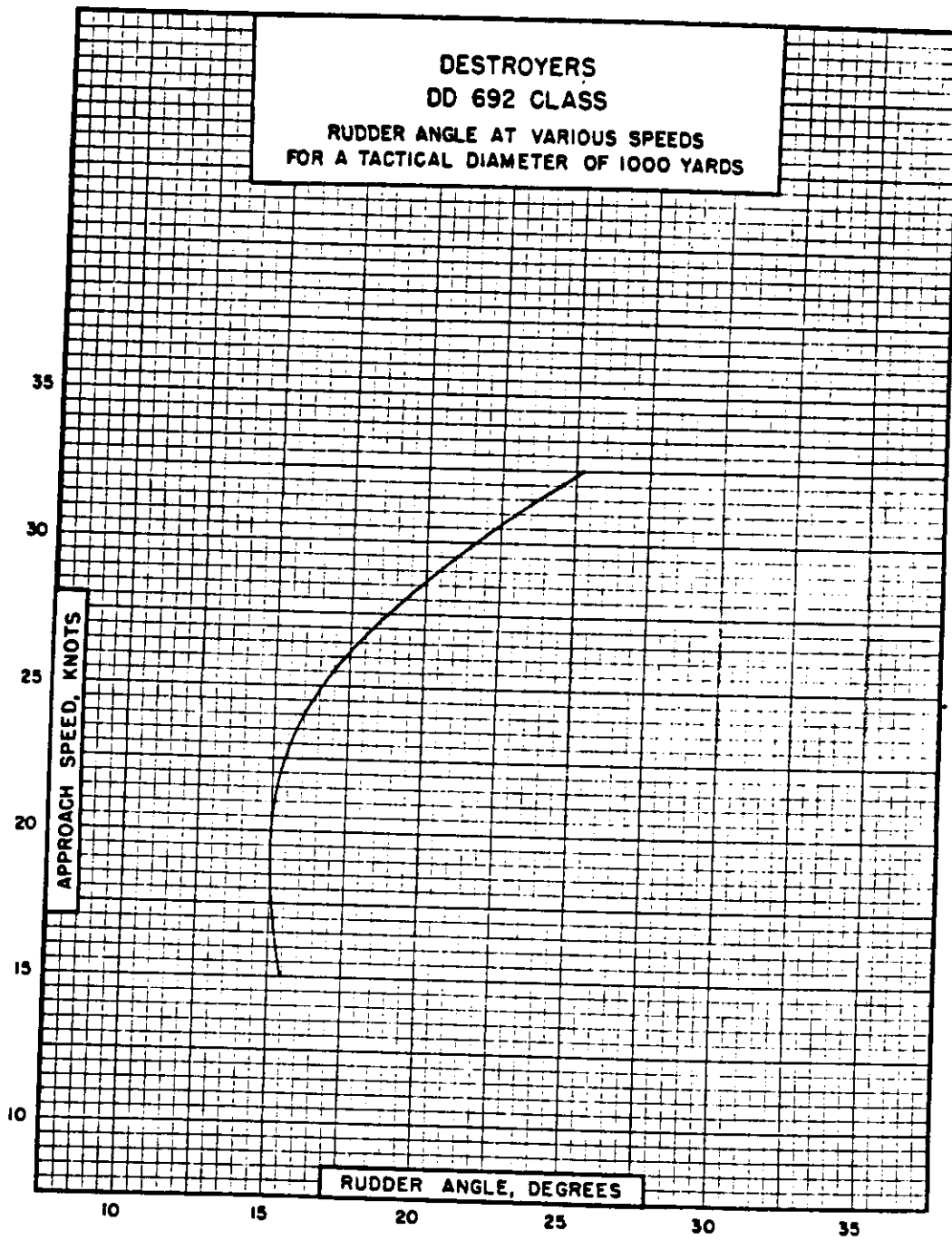
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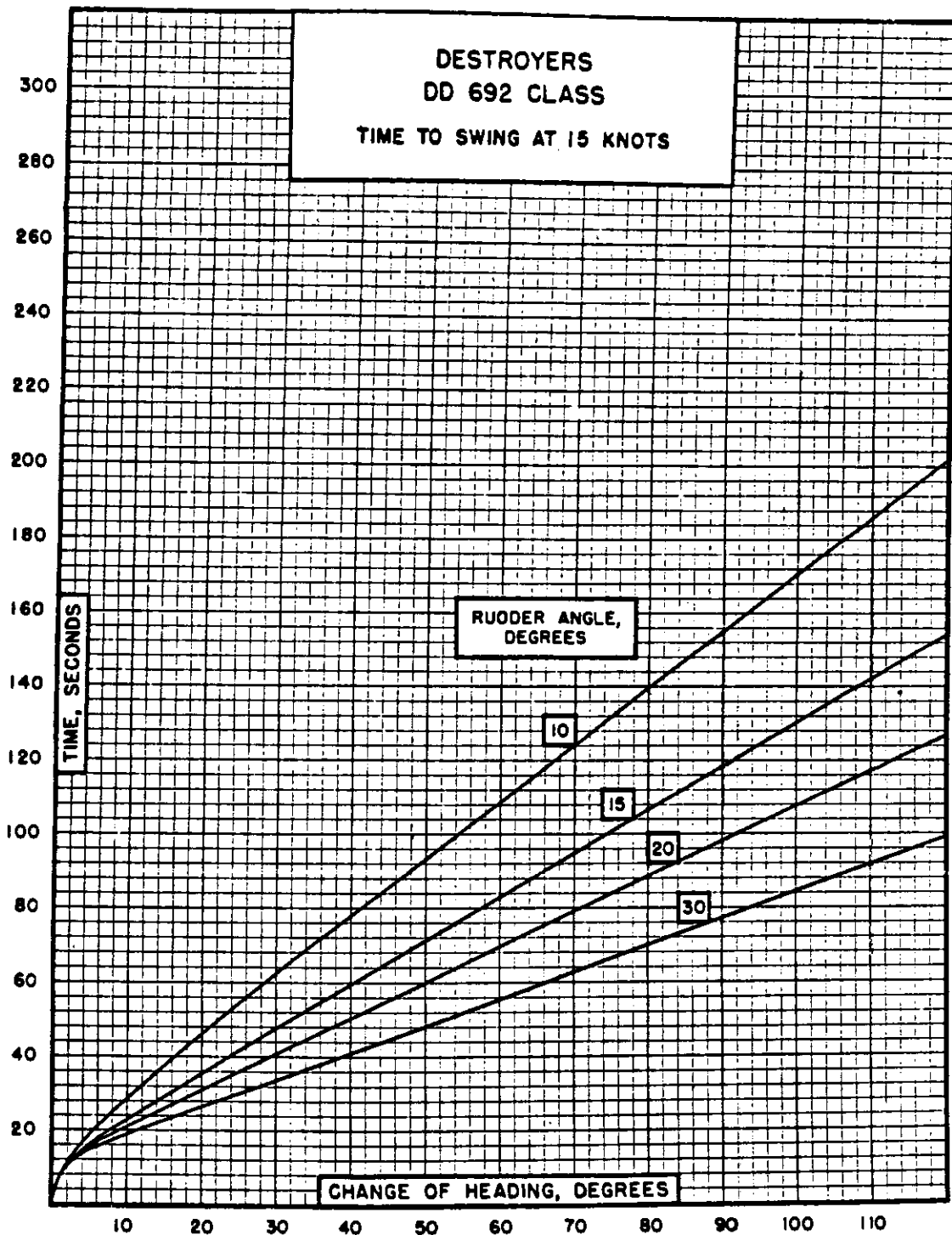
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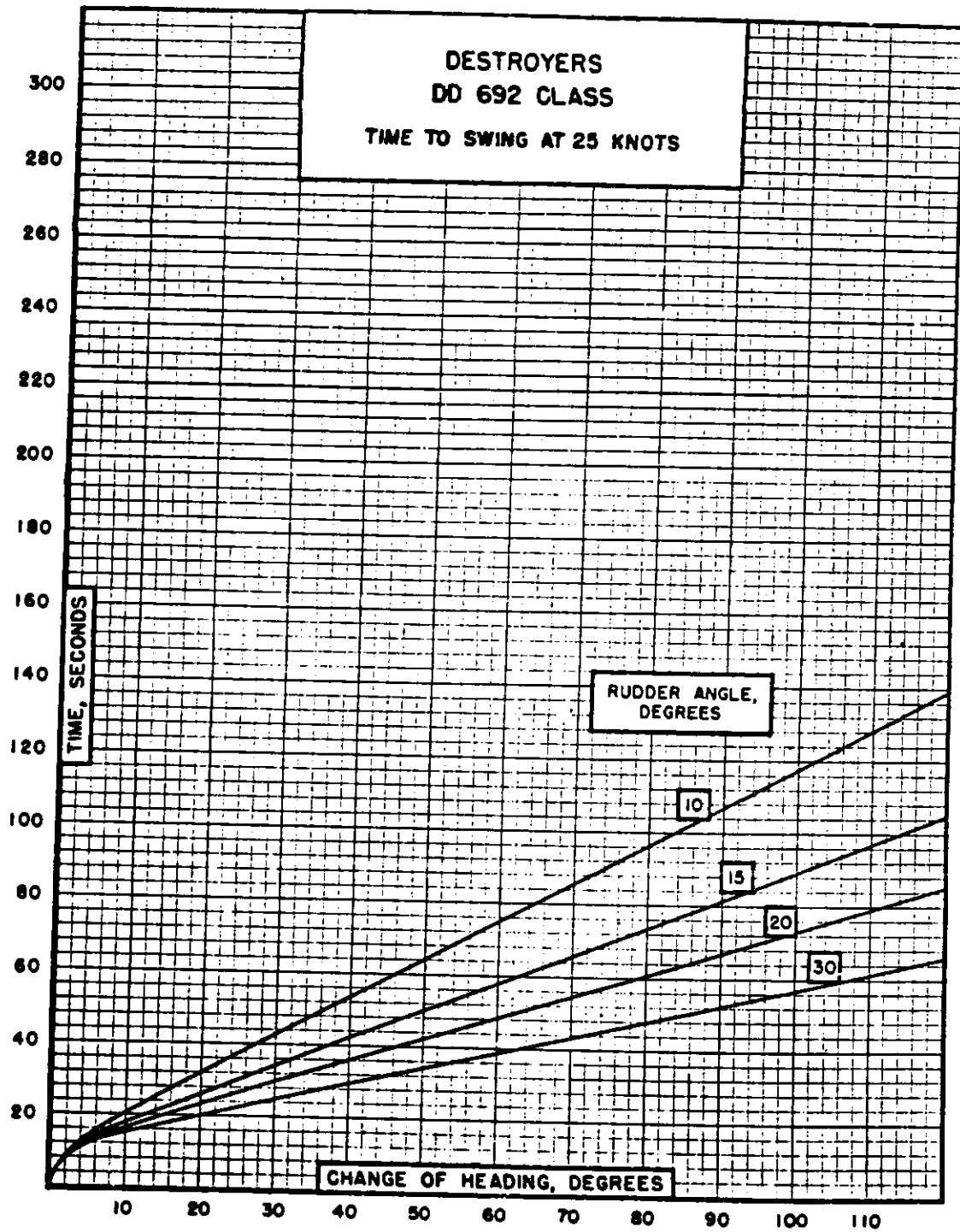
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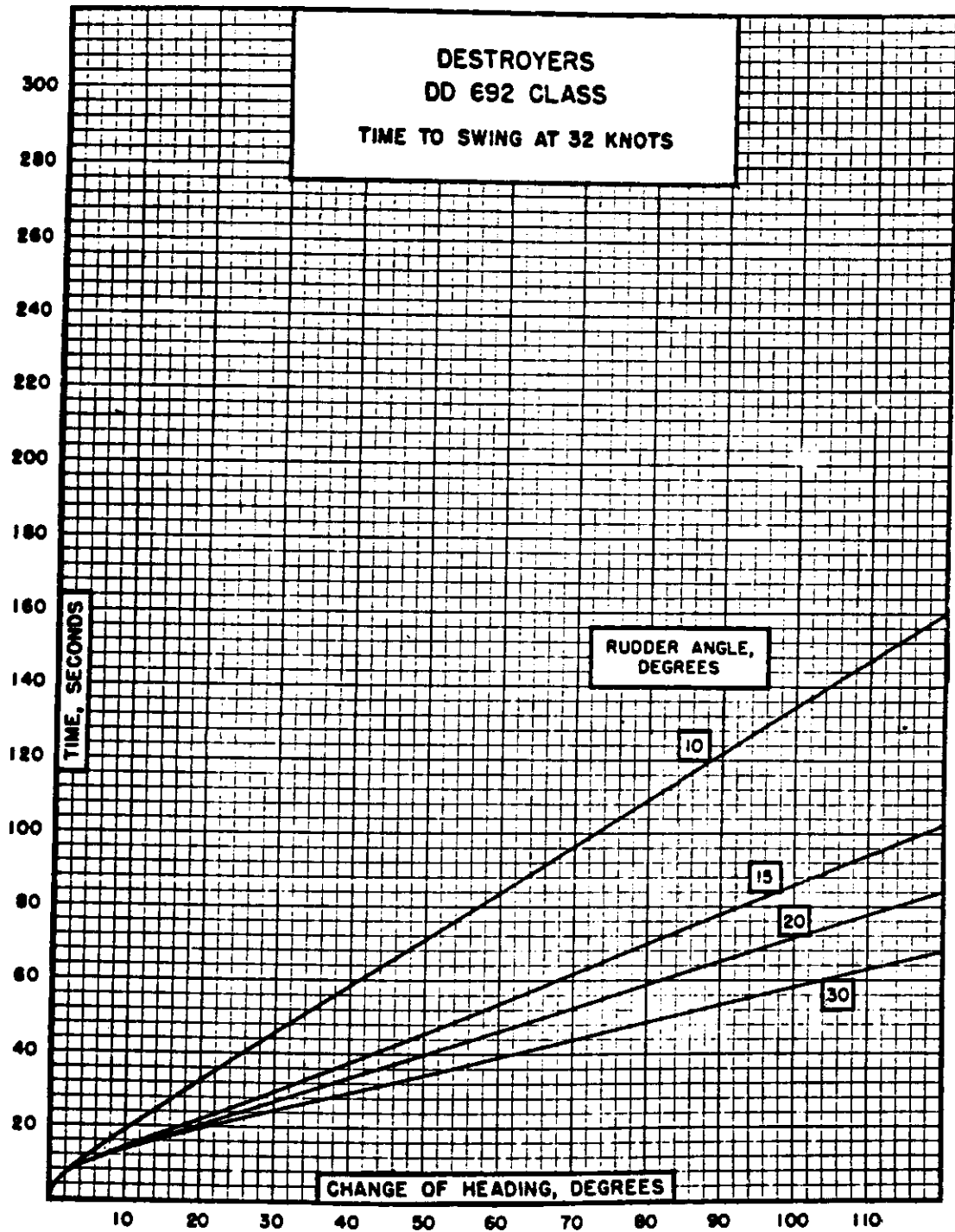
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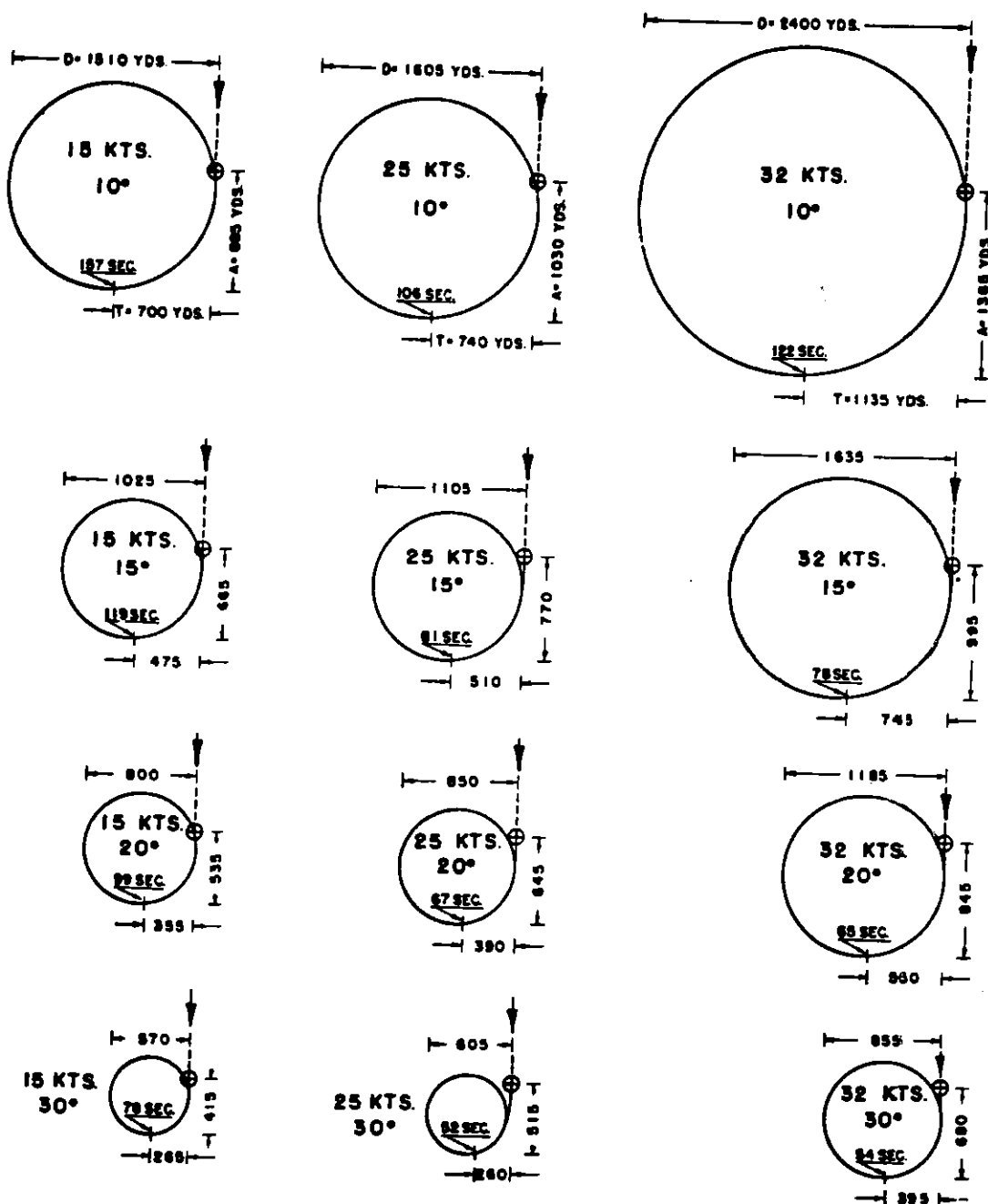
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DESTROYERS DD 692 CLASS
TURNING CIRCLES

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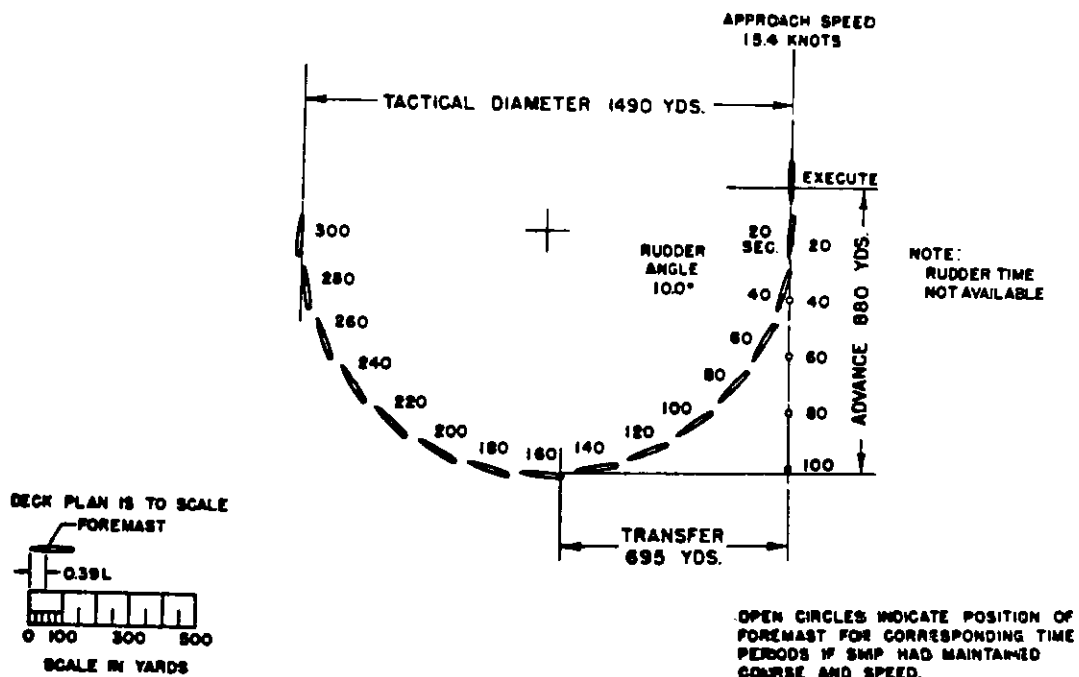
DESTROYERS
DD 692 CLASS

15 KNOTS

10 DEGREES

INITIAL TURNING MOVEMENT
20 SECOND INTERVALS

TIME, SECONDS	SPEED IN TURN, KNOTS	CHANGE OF HEADING, DEGREES	COORDINATES	
			X YARDS	Y YARDS
EXECUTE	15.4	0.0	0	0
20	15.2	8.7	170	0
40	14.8	17.0	335	25
60	14.6	30.2	490	85
80	14.6	43.5	625	180
100	14.6	56.5	740	300
120	14.8	69.7	820	445
140	14.6	82.7	870	605
160	14.6	96.0	885	770
180	14.6	109.0	865	930
200	14.6	122.0	805	1080
220	14.6	135.2	715	1220
240	14.6	148.0	600	1335
260	14.6	160.7	460	1420
280	14.6	173.0	305	1475
300	14.6	185.0	140	1495



DESTROYERS
DD 692 CLASS

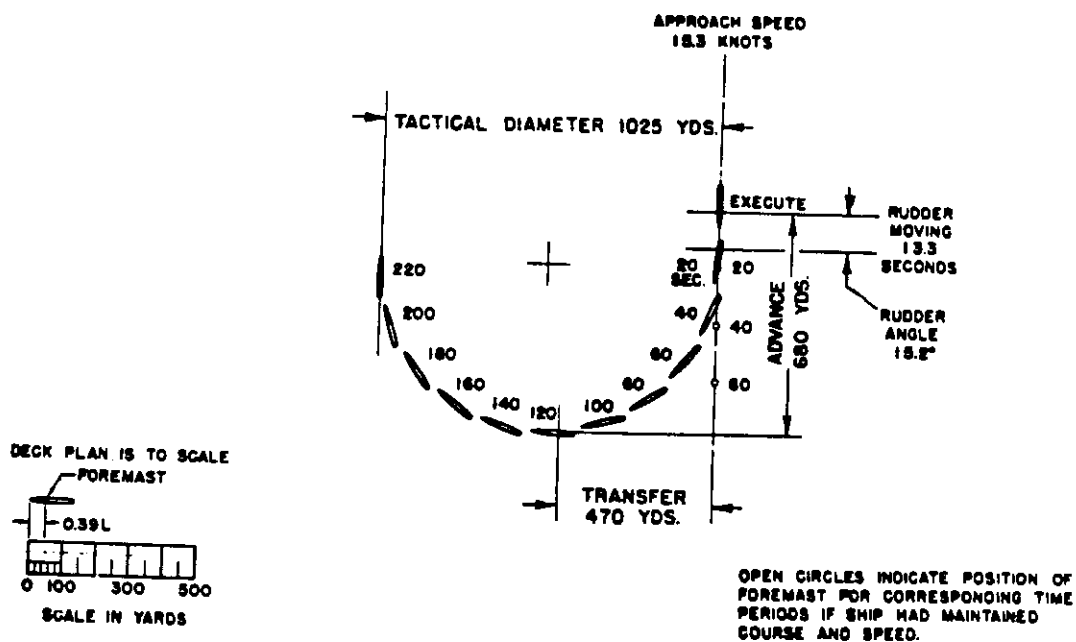
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15 KNOTS

15 DEGREES

INITIAL TURNING MOVEMENT
20 SECOND INTERVALS

TIME, SECONDS	SPEED IN TURN, KNOTS	CHANGE OF HEADING, DEGREES	COORDINATES	
			X YARDS	Y YARDS
EXECUTE	18.3	0.0	0	0
20	14.8	8.8	170	8
40	14.2	28.2	330	30
60	13.9	48.2	470	108
80	13.8	68.5	585	220
100	13.7	76.7	650	355
120	13.7	94.0	680	505
140	13.7	111.8	680	660
160	13.7	129.0	590	805
180	13.7	146.2	485	915
200	13.7	163.7	355	995
220	13.7	181.2	205	1025



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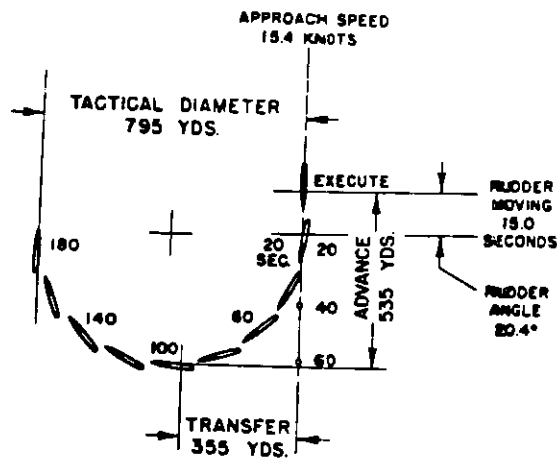
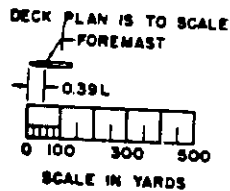
DESTROYERS DD 692 CLASS

15 KNOTS

20 DEGREES

INITIAL TURNING MOVEMENT 20 SECOND INTERVALS

TIME, SECONDS	SPEED IN TURN, KNOTS	CHANGE OF HEADING, DEGREES	COORDINATES	
			X YARDS	Y YARDS
EXECUTE	15.4	0.0	0	0
20	14.5	10.0	165	0
40	13.3	29.0	315	40
60	12.9	51.5	430	130
80	12.9	74.0	510	255
100	12.9	96.5	535	395
120	12.9	119.0	510	540
140	12.9	141.0	435	665
160	12.9	162.0	315	755
180	12.9	182.2	180	800



OPEN CIRCLES INDICATE POSITION OF
FOREMAST FOR CORRESPONDING TIME
PERIODS IF SHIP HAD MAINTAINED
COURSE AND SPEED.

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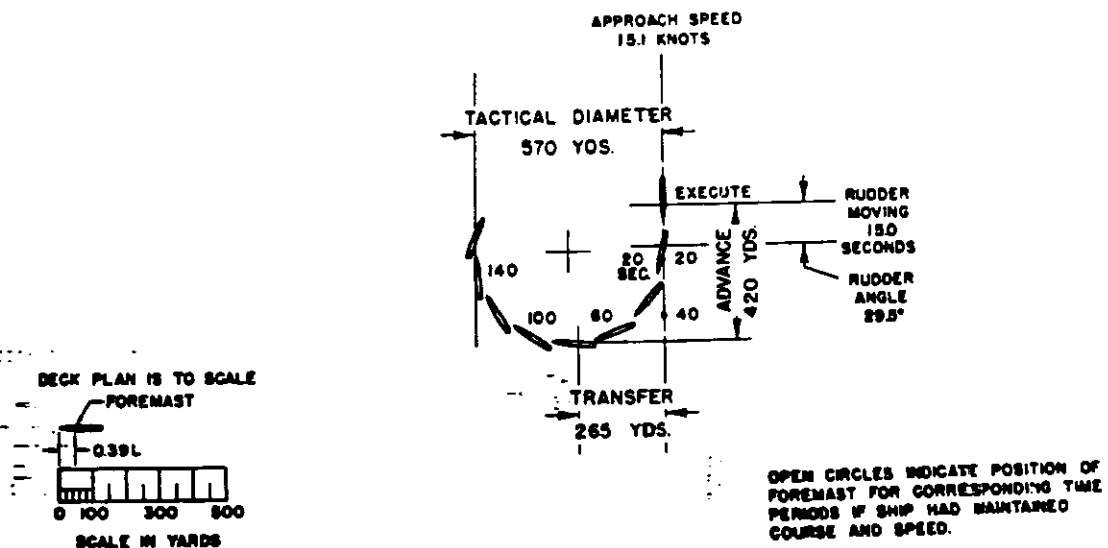
DESTROYERS DD 692 CLASS

15 KNOTS

30 DEGREES

INITIAL TURNING MOVEMENT 20 SECOND INTERVALS

TIME, SECONDS	SPEED IN TURN, KNOTS	CHANGE OF HEADING, DEGREES	COORDINATES	
			X YARDS	Y YARDS
EXECUTE	15.1	0.0	0	0
20	14.4	12.5	165	6
40	13.1	41.0	305	80
60	11.7	69.2	395	170
80	11.2	96.7	420	290
100	11.1	123.5	390	415
120	11.1	149.5	310	515
140	11.1	175.5	200	565
160	11.1	201.5	75	565



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10 DEGREES

TIME, SECONDS	SPEED IN TURN, KNOTS	CHANGE OF HEADING, DEGREES	COORDINATES	
			X YARDS	Y YARDS
EXECUTE	26.1	0.0	0	0
10	25.6	1.5	145	0
20	25.3	6.7	290	0
30	25.2	18.2	430	25
40	25.0	25.0	565	70
50	24.9	35.2	685	140
60	24.8	45.5	795	230
70	24.8	55.7	890	335
80	24.8	65.7	975	455
90	24.8	75.5	1020	585
100	24.8	85.5	1050	720
110	24.8	95.2	1060	860
120	24.8	105.0	1045	1005
130	24.8	114.7	1010	1140
140	24.8	124.2	950	1265
150	24.8	133.7	865	1375
160	24.8	143.2	770	1480
170	24.8	152.7	650	1560
180	24.8	162.2	525	1620
190	24.8	171.7	390	1660
200	24.8	181.0	250	1680



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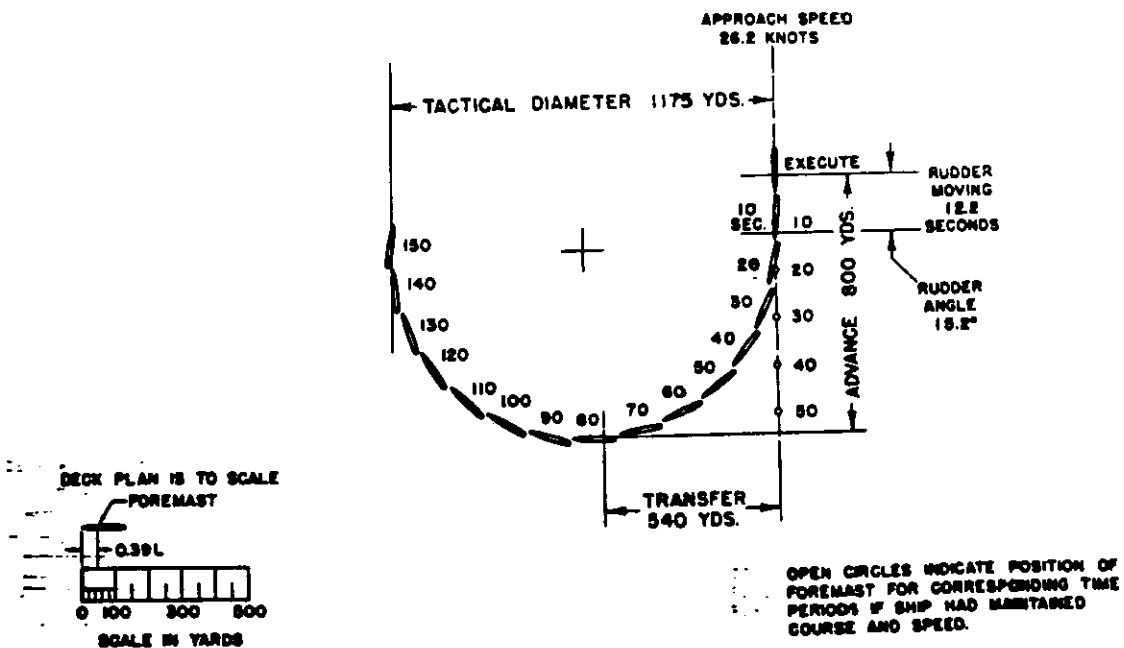
DESTROYERS DD 692 CLASS

25 KNOTS

15 DEGREES

INITIAL TURNING MOVEMENT 10 SECOND INTERVALS

TIME, SECONDS	SPEED IN TURN, KNOTS	CHANGE OF HEADING, DEGREES	COORDINATES	
			X YARDS	Y YARDS
EXECUTE	26.2	0.0	0	0
10	26.7	4.9	146	0
20	24.6	13.7	290	10
30	24.4	25.0	425	45
40	24.4	38.2	550	110
50	24.4	52.7	656	200
60	24.4	68.7	730	310
70	24.4	80.6	780	440
80	24.4	94.9	805	580
90	24.4	108.0	790	715
100	24.4	121.8	745	850
110	24.4	135.0	670	965
120	24.4	148.2	570	1060
130	24.4	161.7	450	1130
140	24.4	175.2	315	1165
150	24.4	189.0	175	1175



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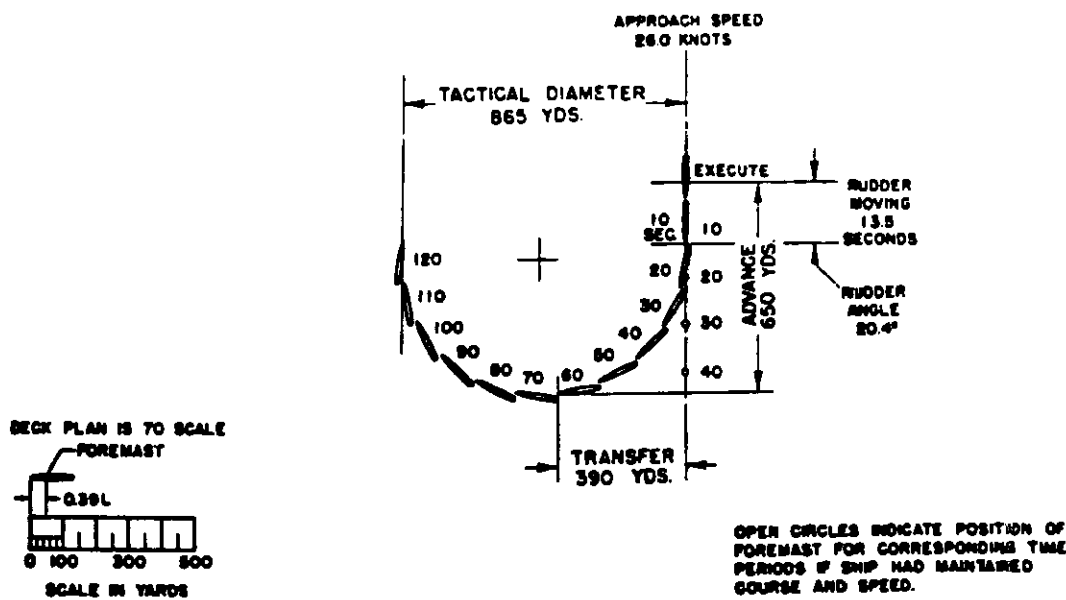
DESTROYERS DD 692 CLASS

25 KNOTS

20 DEGREES

INITIAL TURNING MOVEMENT 10 SECOND INTERVALS

TIME, SECONDS	SPEED IN TURN, KNOTS	CHANGE OF HEADING, DEGREES	COORDINATES	
			X YARDS	Y YARDS
EXECUTE	26.0	0.0	0	0
10	25.0	1.2	145	0
20	23.8	13.0	280	8
30	23.0	30.0	405	48
40	22.9	47.7	510	115
50	22.9	65.2	590	220
60	22.9	82.7	640	340
70	22.9	100.2	650	470
80	22.9	117.7	625	595
90	22.9	135.5	560	710
100	22.9	153.5	465	795
110	22.9	171.2	350	850
120	22.9	188.7	220	870



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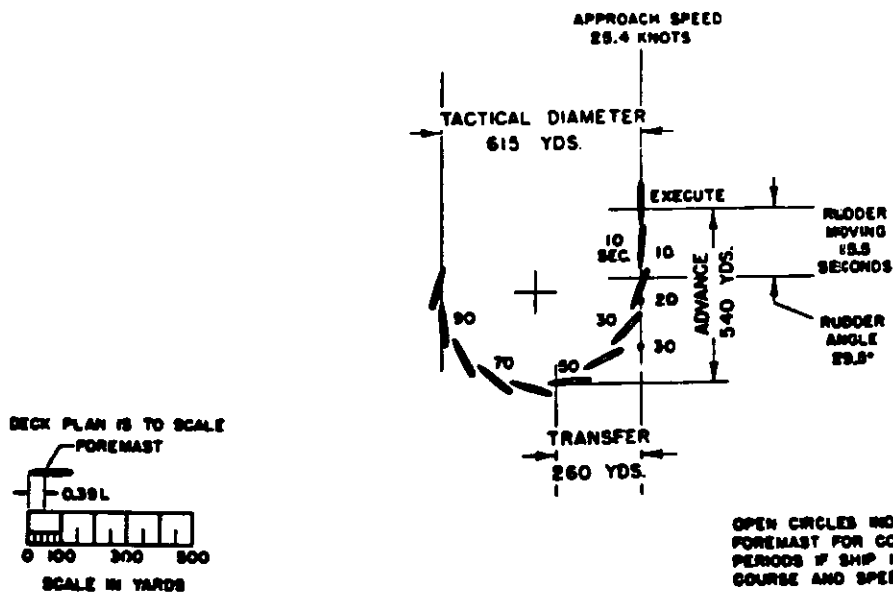
DESTROYERS
DD 692 CLASS

25 KNOTS

30 DEGREES

INITIAL TURNING MOVEMENT
10 SECOND INTERVALS

TIME, SECONDS	SPEED IN TURN, KNOTS	CHANGE OF HEADING, DEGREES	COORDINATES	
			X YARDS	Y YARDS
EXECUTE	25.4	0.0	0	0
10	24.8	5.0	140	0
20	23.2	22.0	265	10
30	21.9	43.0	380	55
40	21.1	64.2	475	135
50	20.7	86.0	535	240
60	20.7	108.0	545	385
70	20.7	130.2	510	485
80	20.7	152.5	440	555
90	20.7	174.7	335	610
100	20.7	197.0	220	620



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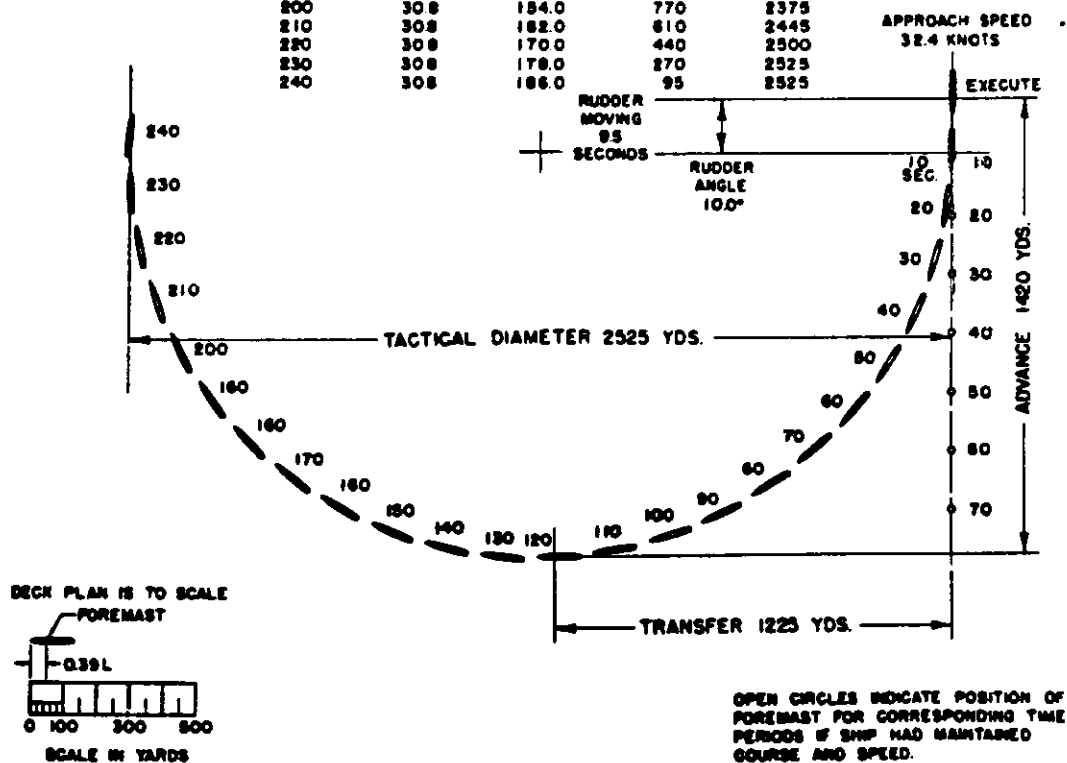
DESTROYERS DD 692 CLASS

32 KNOTS

10 DEGREES

INITIAL TURNING MOVEMENT 10 SECOND INTERVALS

TIME, SECONDS	SPEED IN TURN, KNOTS	CHANGE OF HEADING, DEGREES	COORDINATES	
			X YARDS	Y YARDS
EXECUTE	32.4	0.0	0	0
10	31.2	1.0	187	8
20	30.8	8.0	385	20
30	30.8	16.0	525	60
40	30.8	24.0	685	120
50	30.8	32.0	840	205
60	30.8	40.2	975	310
70	30.8	48.0	1100	435
80	30.8	57.0	1210	570
90	30.8	65.5	1295	725
100	30.8	73.7	1360	880
110	30.8	82.0	1400	1055
120	30.8	90.0	1420	1225
130	30.8	98.0	1410	1395
140	30.8	106.0	1385	1570
150	30.8	114.0	1335	1735
160	30.8	122.0	1255	1895
170	30.8	130.0	1160	2040
180	30.8	138.0	1050	2170
190	30.8	146.0	915	2280
200	30.8	154.0	770	2375
210	30.8	162.0	610	2445
220	30.8	170.0	440	2500
230	30.8	178.0	270	2525
240	30.8	186.0	95	2525



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DESTROYERS
DD 692 CLASS

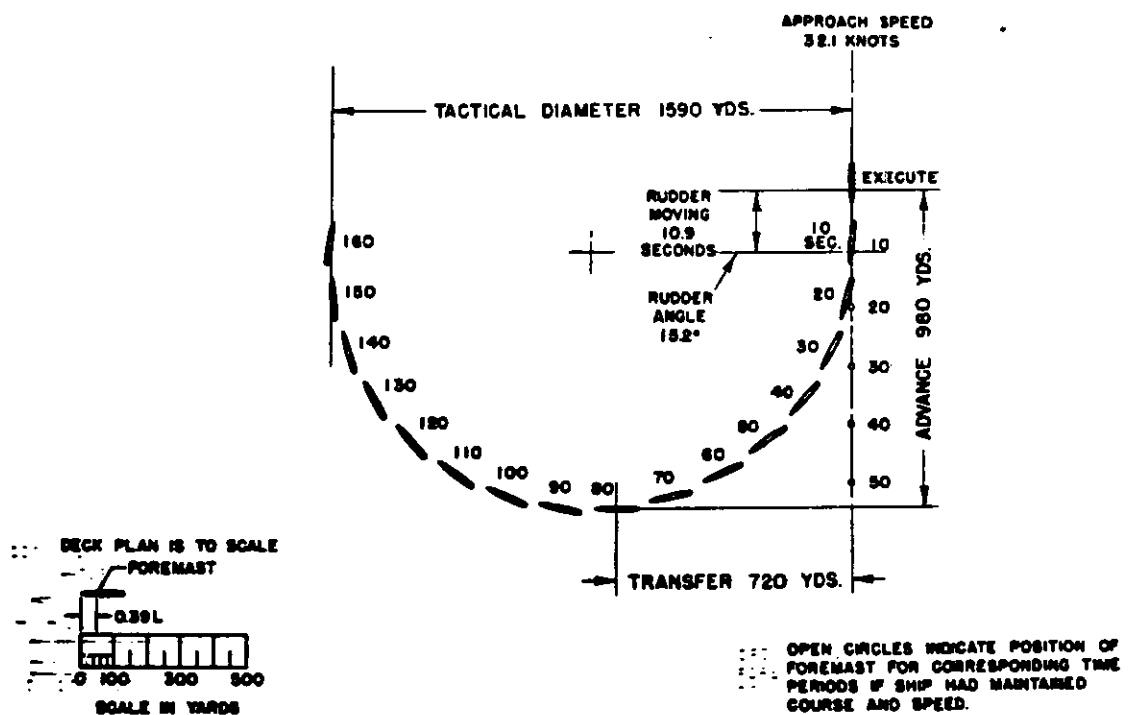
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32 KNOTS

15 DEGREES

INITIAL TURNING MOVEMENT
10 SECOND INTERVALS

TIME, SECONDS	SPEED IN TURN, KNOTS	CHANGE OF HEADING, DEGREES	COORDINATES X YARDS	Y YARDS
EXECUTE	32.1	0.0	0	0
10	31.9	9.0	180	0
20	30.8	15.2	350	20
30	30.3	23.7	510	70
40	30.0	41.8	660	155
50	30.0	54.0	780	270
60	30.0	66.5	880	410
70	30.0	79.0	950	570
80	30.0	91.0	980	735
90	30.0	103.2	975	905
100	30.0	115.5	935	1070
110	30.0	127.7	865	1220
120	30.0	140.0	780	1355
130	30.0	152.0	625	1465
140	30.0	164.2	475	1540
150	30.0	176.5	310	1585
160	30.0	188.7	145	1590



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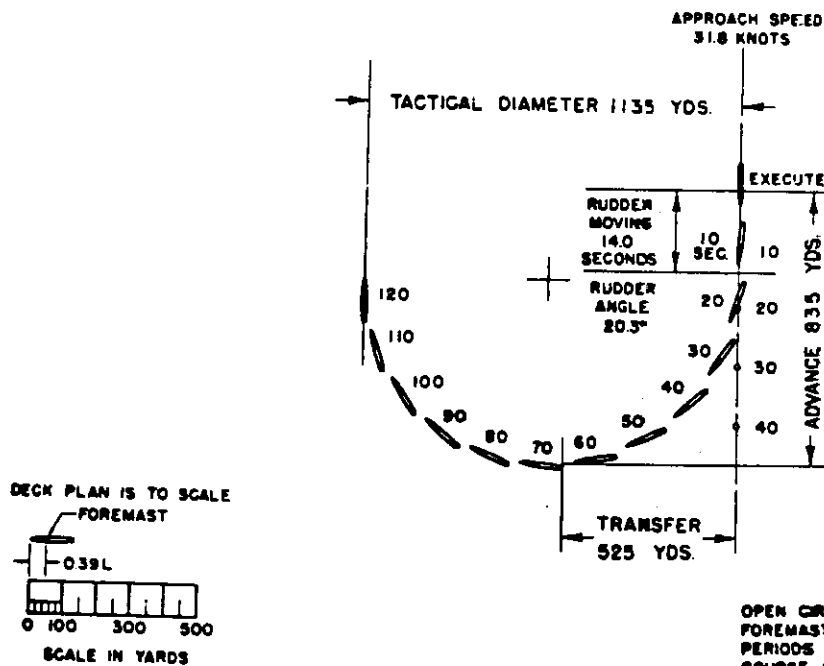
DESTROYERS
DD 692 CLASS

32 KNOTS

20 DEGREES

INITIAL TURNING MOVEMENT
10 SECOND INTERVALS

TIME, SECONDS	SPEED IN TURN, KNOTS	CHANGE OF HEADING, DEGREES	COORDINATES	
			X YARDS	Y YARDS
EXECUTE	31.8	0.0	0	0
10	31.8	8.0	180	0
20	31.2	20.0	395	10
30	30.7	35.2	620	60
40	30.1	50.7	860	155
50	29.4	66.2	1120	290
60	28.8	82.0	1400	445
70	28.5	98.0	1700	605
80	28.3	114.2	2020	765
90	28.5	130.5	2360	905
100	28.5	147.0	2720	1020
110	28.5	163.5	3100	1100
120	28.5	180.0	3500	1135



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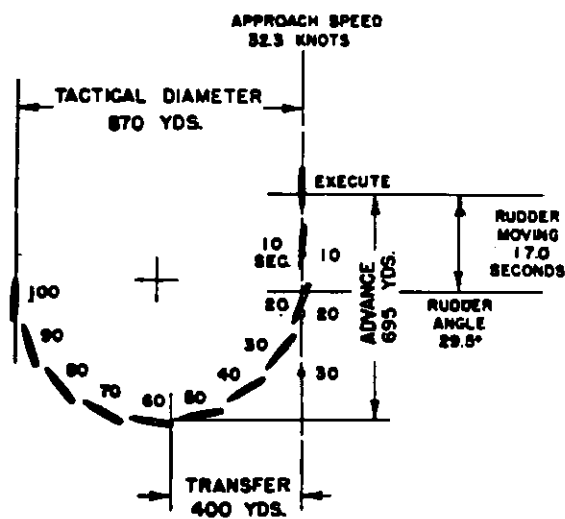
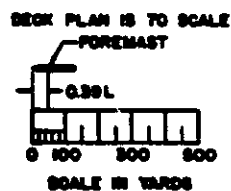
DESTROYERS DD 692 CLASS

32 KNOTS

30 DEGREES

INITIAL TURNING MOVEMENT 10 SECOND INTERVALS

TIME, SECONDS	SPEED IN TURN, KNOTS	CHANGE OF HEADING, DEGREES	COORDINATES	
			X YARDS	Y YARDS
EXECUTE	32.3	0.0	0	0
10	31.3	8.7	180	0
20	29.2	21.7	350	10
30	27.4	38.7	500	75
40	26.9	59.2	610	180
50	26.9	78.5	680	320
60	26.9	100.0	695	475
70	26.9	120.7	680	620
80	26.9	141.8	575	745
90	26.9	162.0	450	830
100	26.9	182.7	305	870



OPEN CIRCLES INDICATE POSITION OF
FOREMAST FOR CORRESPONDING TIME
PERIODS IF SHIP HAD MAINTAINED
COURSE AND SPEED.

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ENGINEER'S BELL BOOK - ALL VESSELS
NAVJAG 3120/1 (Rev. 10-67)
Previously NAVJAG 116)
1-4-010-001-0400

ENGINEER'S BELL BOOK

ALL FRANK E. EVANS 222 PERRY MOOR PART (2) DATE 2 JUNE 69
In route from SEA to SEA

Record of all "BELL," "SIGNAL," and "COUNTER" received regarding movement of propulsion this date

TIME ZONE DESCRIPTION				Clock at back or ahead				In				alt. of			
(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
TIME	SIGNAL	L.P.A.	COUNTER OR PITCH SET	TIME	SIGNAL	L.P.A.	COUNTER OR PITCH SET	TIME	SIGNAL	L.P.A.	COUNTER OR PITCH SET	TIME	SIGNAL	L.P.A.	COUNTER OR PITCH SET
1825	II	206	922220	2106	217		956010	2325	2/3	88	982930				
1826	II	242	922310	2108	I	164	956240	2331	II	164	983780				
1839	217		925490	2111	184		956930	2333	174		984160				
1840	229		925990	2112	206		957070	2338	184		985080				
1844	II	206	926700	2119	164		958490								
1850	II	242	928100	2136	169		961240								
1900	Counter	248	928530	2148	174		963310	2342	164		984760				
1908	II	206	930080	2151	II	229	963960	2346	I	154	985360				
1922	217		931200	2154	242		964650	2346	184		985480				
1940	184		934260	2158	229		965580	2346	185		985480				
1941	II		934260	2200	Counter	184	966060	2352	II	164	985280				
1942	II		934260	2206	217		967640	2400	Counter	184	985280				
1943	II		934260	2209	229		968190								
1944	II	229	941920	2211	II	184	968530								
1945	217		941920	2212	185		968860								
1946	Counter	184	941970	2220	I	135	970330								
1947	229		942120	2222	2/3		970699								
1948	II	246	942610	2224	I		970810								
2004	164		942780	2224	II	184	970970								
2005	I	165	942930	2226	185		971190								
2006	II	242	943220	2228	164		971650								
2007	I	164	946910	2230	185		972310								
2036	206		947890	2231	164		972510								
2051	II	229	952350	2232	184		973190								
2052	242		952590	2233	184		973590								
2053	229		952910	2234	184		973940								
2054	Counter	248	953080	2235	184		974130								
2055	242		953080	2236	184		974130								
2056	229		953080	2237	184		974130								
2057	242		953080	2238	184		974130								
2058	229		953080	2239	184		974130								
2059	242		953080	2240	184		974130								
2060	229		953080	2241	184		974130								
2061	242		953080	2242	184		974130								
2062	229		953080	2243	184		974130								
2063	242		953080	2244	184		974130								
2064	229		953080	2245	184		974130								
2065	242		953080	2246	184		974130								
2066	229		953080	2247	184		974130								
2067	242		953080	2248	184		974130								
2068	229		953080	2249	184		974130								
2069	242		953080	2250	184		974130								
2070	229		953080	2251	184		974130								
2071	242		953080	2252	184		974130								
2072	229		953080	2253	184		974130								
2073	242		953080	2254	184		974130								
2074	229		953080	2255	184		974130								
2075	242		953080	2256	184		974130								
2076	229		953080	2257	184		974130								
2077	242		953080	2258	184		974130								
2078	229		953080	2259	184		974130								
2079	242		953080	2260	184		974130								
2080	229		953080	2261	184		974130								
2081	242		953080	2262	184		974130								
2082	229		953080	2263	184		974130								
2083	242		953080	2264	184		974130								
2084	229		953080	2265	184		974130								
2085	242		953080	2266	184		974130								
2086	229		953080	2267	184		974130								
2087	242		953080	2268	184		974130								
2088	229		953080	2269	184		974130								
2089	242		953080	2270	184		974130								
2090	229		953080	2271	184		974130								
2091	242		953080	2272	184		974130								
2092	229		953080	2273	184		974130								
2093	242		953080	2274	184		974130								
2094	229		953080	2275	184		974130								
2095	242		953080	2276	184		974130								
2096	229		953080	2277	184		974130								
2097	242		953080	2278	184		974130								
2098	229		953080	2279	184		974130								
2099	242		953080	2280	184		974130								
2100	229		953080	2281	184		974130								
2101	242		953080	2282	184		974130								
2102	229		953080	2283	184		974130								
2103	242		953080	2284	184		974130								
2104	229		953080	2285	184		974130								
2105	242		953080	2286	184		974130								
2106	229		953080	2287	184		974130								
2107	242		953080	2288	184		974130								
2108	229		953080	2289	184		974130								
2109	242		953080	2290	184		974130								
2110	229		953080	2291	184		974130								
2111	242		953080	2292	184		974130								
2112	229		953080	2293	184		974130								
2113	242		953080	2294	184		974130								
2114	229		953080	2295	184		974130								
2115	242		953080	2296	184		974130								
2116	229		953080	2297	184		974130								
2117	242		953080	2298	184		974130								
2118	229		953080	2299	184		974130								
2119	242		953080	2300	184		974130								
2120	229		953080	2301	184		974130								
2121	242		953080	2302	184		974130								
2122	229		953080	2303	184		974130								
2123	242		953080	2304	184		974130								
2124	229		953080	2305	184		974130								
2125	242		953080	2306	184		974130								
2126	229		953080	2307	184		974130								
2127	242		953080	2308	184		974130								
2128	229		953080	2309	184		974130								
2129	242		953080	2310	184		974130								
2130	229		953080	2311	184		974130								
2131	242		953080	2312	184		974130								
2132	229		953080	2313	184		974130								
2133	242		953080	2314	184		974130								
2134	229		953080	2315	184		974130								
2135	242		953080	2316	184		974130								
2136	229		953080	2317	184		974130								
2137	242		9												

DATA ACQUISITION

En route from Sidney

Each set back or ahead 1 hrs. 0 min. at 1

EX	69
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ANNEX 'A'

0315 Collision
 0315+ Wessex 831 and 823 recalled from screen.
 0320 approx 831 and 823 in search at collision scene. 831 winch fitted.
 (831 - LCDR RODGERS. 823 LEUT WALDRON)
 0333 831 landed on with survivor. Aircrewman left aircraft to
 reduce weight. (LCDR RODGERS).
 0334 Launched 830 SAR helo (LCDR RILEY).
 0334 Launched 831 (LCDR RODGERS)
 0335 Launched 828 SAR helo (LEUT NICOLL)
 0338 Recovered 823 and retained onboard - not winch fitted.
 0335-0430 approx 4 or 5 (SH3) from KEARSARGE on scene.
 0340 approx 828 recovered with survivor (LCDR RILEY) and launched immediat-
 ely. This recovery and launch not recorded.
 0359 Recovered 831 (LCDR RODGERS) Although winch fitted, 831 is an
 ASW aircraft, and by this time more than enough helos were in
 the area with a better SAR capability and safe control was
 important. Recovering 831 did not reduce the search effort.
 0417 SH3 314 from KEARSARGE recovered with doctors onboard.
 0420 SH3 314 launched for search.
 0500 SH3 314 recovered to collect injured survivor for KEARSARGE.
 0505 SH3 314 launched for KEARSARGE with injured survivor.
 0507 SH3 303 from KEARSARGE recovered with doctors from other
 ships.
 0509 SH3 303 launched for search.
 0518 WX 830 recovered - RTR.
 0526 WX 830 launched for search relief crew (LEUT WILEY).
 * 0540 WX 828 recovered - RTR.
 0543 WX 828 launched for search relief crew (LEUT BUCKETT).

Note:

Until 0540 helos employed in sectors as in sketch Annex 'B' but side
 numbers of aircraft in sectors not recorded and some changes were made
 during the period. MELBOURNE was used as the datum.

0605 SH3 302 diverted to PARRAMATTA for MEDEVAC to KEARSARGE.
 0638 SH3 302 recovered - Admiral King aboard.
 0639 SH3 302 launched - datum search while awaiting Admiral King.
 0640 SH3's 311, 315 and 306 recalled to KEARSARGE for RTR.
 0645 Search sectors adjusted as follows:

060-180	SH3 314	Search sector out to 5 n.m.
180-300	SH3 303	Search sector out to 5 n.m.
300-060	WX 830	Search sector out to 5 n.m.
Datum	WX 828	Circular sector out to $\frac{1}{2}$ n.m.

Datum established at 0645 300°T/3.4 n.m. from MELBOURNE

* Search based on 'sinking' position datum 300°T/3,600 yards from MELBOURNE.

Search sectors designated as follows - all bearings true.

000-060	WX 830	Search sector out to 5 n.m.
060-120	SH3 314	Search sector out to 5 n.m.
120-180	SH3 303	Search sector out to 5 n.m.
180-240	SH3 311	Search sector out to 5 n.m.
240-300	SH3 315	Search sector out to 5 n.m.
300-360	SH3 306	Search sector out to 5 n.m.
Datum	SH3 302	Circular sector out to $\frac{1}{2}$ n.m.

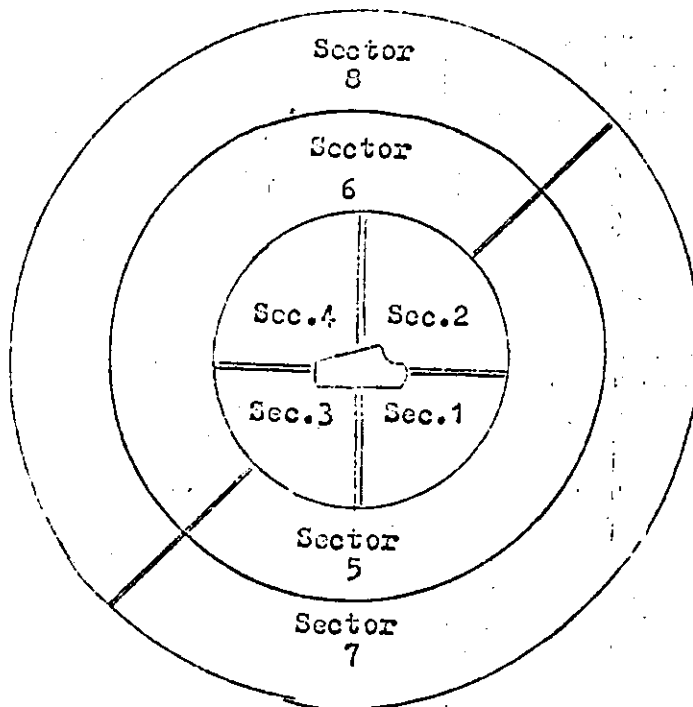
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Ex. 70

ENCLOSURE (70)

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ANNEX 'B'



The sectors are numbered here for convenience but such numbers were not used when ordering searches. Relative bearings and distances were used.

Sector 1	000	to	Green 90	Out to $\frac{1}{4}$ mile
2	000	to	Red 90	Out to $\frac{1}{4}$ mile
3	Green 90	to	Green 180	Out to $\frac{1}{4}$ mile
4	Red 90	to	Red 180	Out to $\frac{1}{4}$ mile
5	Red 45	to	Green 135 - thru 000	440-660 yards
6	Red 45	to	Green 135 - thru 180	440-660 yards
7	Red 45	to	Green 135 - thru 000	660-880 yards
8	Red 45	to	Green 135 - thru 180	660-880 yards

At times aircraft were in each sector, but on some occasions sectors were combined depending on number of aircraft available. Sectors 1, 2, 3 and 4 had aircraft in them continuously and when insufficient aircraft were available, sectors 6 and 8 separately or combined were concentrated on as this area was closer to the 'sinking' position.

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Ex. 71

ENCLOSURE (71)

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EX. 72

ENCLOSURE (2)

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EX. 73



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ENCLOSURE (3)

DECLASSIFIED

RECORD OF WORKING OF MAIN ENGINES Exh. 74

DATE 2-1-69					DATE 3-6-69				
Shaft		Shaft		Initials of Watch-keeper and Rating in charge	Shaft		Shaft		Initials of Watch-keeper and Rating in charge
Time	Order	Revs.	Order		Time	Order	Revs.	Order	
20	14	14							
20									
20									
21		154							
21		15							
21		154							
21		15							
22		154							
22		15							
22		154							
22		15							
23		154							
23		15							
0326	SH				0215	F.S.	154		
0328	"								
0330	SH								
0332	S								
0335	TURN M.F. BY STEAM								
0338	"								
0341	"								
0344	"								
0347	"								
0350	"								
0353	"								
0356	"								
0359	"								
0400			SH						
0400			S						
0402	TURN M.F. BY STEAM								
0405	"								
0410	"								

14500/65

EX 74

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ENCLOSURE (7)

DECLASSIFIED

Exh. 75

RECORD OF WORKING OF MAIN ENGINES

DATE - 2 6 60				Initials of Watch-keeper and Rating in charge	DATE				Initials of Watch-keeper and Rating in charge
Port Shaft		Starboard Shaft			Starboard Shaft		Starboard Shaft		
Time	Order	Revs.	Order		Time	Order	Revs.	Order	
1026 ³⁰	HH	112			1800	HH	174		
1029	HH	110			1840	HH	196		
1031	HH	112			191	HH	216		
1034	HH	110			1847	HH	194		
1036	HH	112			1849	HH	194		
1038	HH	110			1954	HH	196		
1041	HH	111			2004	HH	156		
1055	HH	110			2055	HH	216		
1057 ³⁰	HH	112			2109	HH	156		
1104	SN				2145	HH	216		
1108	HH	128			2208	HH	176		
1118	HH	84			2227	HH	156		
1130	HH	68			2253	HH	196		
1152	HH	168			2256	HH	214		
1203	S	168			2306	HH	156		
1330	HH	164			2307	HH	156		
1331	HH	118			0308	SS	155		
1352	HH	136			0310	S	155		
1335	HH	168			0329	SS	155		
1341	HH	174			0330	S	155		
1407	HH	154			0400	SN	155		
1408 ³⁰	HH	74			0400	S	155		
1442	HH	136			0410	SN	155		
1454 ³⁰	HH	174			0410 ³⁰	S	155		
1500	HH	136			0413 ³⁰	S	145		
1557	HH	174							
1657	HH	196							
1658	HH	176							
1734	HH	196							

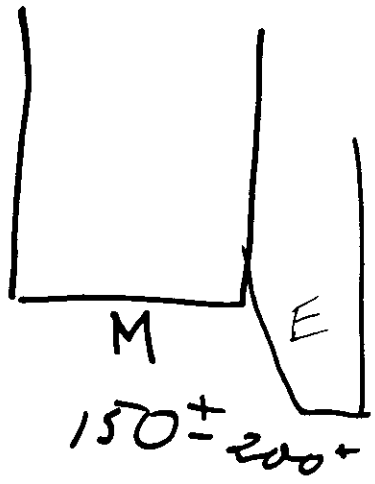
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EX 75

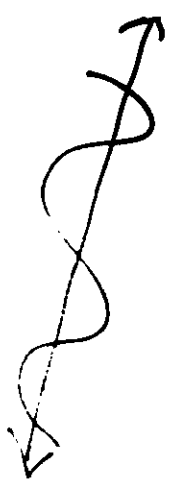
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ENCLOSURE (75)

DECLASSIFIED



→ EV Bow



2+2

X
150+200+

Exh 96

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ENCLOSURE (2)

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LIGHTING DISTRIBUTION SYSTEM

The ship's service and emergency lighting systems are energized from the 450 volt, 3 phase power buses on the generator and distribution switchgear groups through a bank of three single phase 450/117 volt, delta-connected, air-cooled transformers located adjacent to each switchgear group, and thence through the 117 volt, 3 phase, lighting buses on the switchgear group. Each bank of ship's service lighting transformers consists of 3 - 25KVA transformers with a total capacity of 75 KVA per bank. Each bank of emergency lighting transformers consists of 3 - 5 KVA transformers with a total capacity of 15 KVA per bank. The capacity of the transformer banks is such that in case of damage to one transformer the remaining two can carry the essential lighting load with open delta connections.

The lighting system supply is distributed by feeders which originate at the switchboard lighting buses and is then redistributed by means of three lighting distribution panels and other wiring appliances for protection and control of the various individual lighting fixtures and appliances.

Lighting throughout the machinery spaces is supplied primarily from the normal switchgear group for the compartments involved, with some lights in each space supplied from the alternate switchgear group. In addition, a few lights in each space are supplied through automatic bus transfer relays from feeders originating at the emergency switchboards. Uninterrupted lighting is also insured in certain other vital locations, and for all exterior signals, by means of automatic bus transfer equipment which furnish instantaneous emergency lighting system supply upon failure of the ship's service supply. Means are provided for manual operation of these bus transfers in event of failure of any automatic features.

In the event of complete failure of the ship's service and emergency lighting systems, automatic type hand lanterns are provided to supply an instantaneous source of illumination. These hand lanterns are installed at vital stations such as Battle Dressing Stations, Engine Rooms and Piroooms at gauge boards and ship's service switchboards, Steering Gear Motor Room and Portable Pump Station, Crew's Quarters and essential access passageways leading to the weather decks. Also, the automatic type hand lanterns are supplemented by non-automatic type hand lanterns installed at strategic locations throughout the ship to provide a dependable self-contained source of light for carrying out emergency measures when other means of lighting are inoperative.

Since hand lanterns obtain their energy from dry cells which have a limited life, each unnecessary use of a lantern tends to reduce its potential period of usefulness as an emergency light.

Another source of illumination, in the event of failure of the ship's lighting systems, is provided by flashlights supplied to each man for emergency use.

In order to prevent light from showing through open weather deck doors and hatches from topside compartments under darkened ship conditions, door-operated switches are provided at the entrances to these compartments when the door first starts to open.

In addition to the normal lighting, low level illumination is provided by means of red light fixtures. The primary purpose of low level illumination is:

- (1) To provide, in berthing spaces, standing lights which will furnish a minimum intensity of illumination sufficient to furnish safe movement of personnel within the space when the regular lighting is extinguished.
- (2) To provide a limited number of established routes between the berthing spaces and the weather stations, with a reduced light contrast between the interior of the vessel and the dark outside deck so that the period of blindness experienced by ship's personnel going to stations on the outside deck will be reduced to a minimum.
- (3) To provide, in certain compartments opening to the weather decks in which the extinguishing of lights by door switches would not be tolerable during particular circumstances of operation, an illumination so that, by proper arrangement of fixtures and by application of black paint, the reflecting surfaces can be controlled so as not to expose the presence of the vessel.

IV(a)4

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EX 77

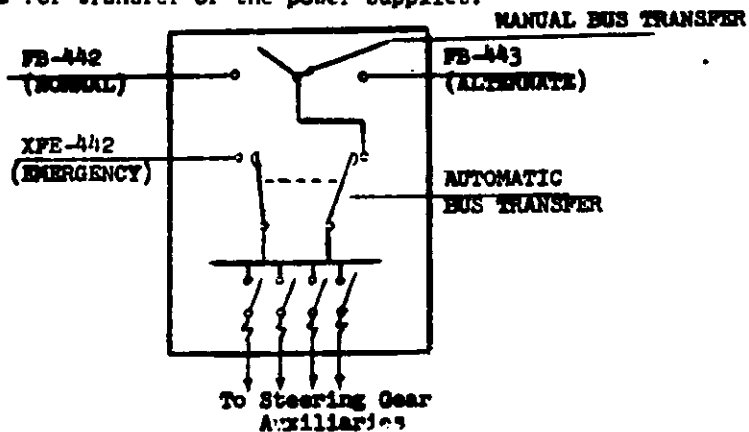
ENCLOSURE (1)

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POWER AND LIGHTING CASUALTY CONTROL INFORMATION

(a) Steering Gear Power Supply--

The steering gear is considered one of the most vital auxiliaries on the ship since its operation is necessary to maintain control of the ship. In view of the vital nature of the steering gear, three separate power supplies are provided for this equipment. The following schematic diagram shows the normal, alternate and emergency power supplies to the steering power transfer switchboard and the equipment provided for transfer of the power supplies:



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Selection of the power supply is by means of bus transfers which are part of the steering power transfer switchboard located in the Steering Gear Motor Room. Selection between normal and alternate ship's service power is by means of a manual transfer switch. Transfer between the selected ship's service feeder and the emergency feeder is by means of an automatic bus transfer. White indicator lights are provided on the steering switchboard to indicate the sources of power available, and a red indicator light is provided to indicate when the steering gear is energized from the emergency supply.

Upon failure of the normal feeder to the steering power transfer switchboard, automatic transfer will be made to the emergency feeder to maintain uninterrupted power to the steering gear. However, in order to minimize the load on the emergency switchboard, the power supply should be transferred to the alternate ship's service supply by means of the manual transfer as soon as possible, provided power is available as shown by the indicator light. A casualty power riser terminal is installed on the steering power transfer switchboard, so that, in the event of loss of all power supply cables to the switchboard, it can be supplied from the casualty power system.

3

Since the steering power automatic transfer equipment has provisions for manual operation of the contactors in case of failure of the automatic feature, personnel should thoroughly familiarize themselves with its operation in order that correct operating procedure is followed to select quickly a source of available power in an emergency. Further, the mechanism and control devices of this equipment should be examined and tested frequently to insure against failure to operate in emergencies, since failure to restore power to the steering gear immediately after loss may endanger the ship or reduce its military effectiveness. For a complete description of the set-up and operation of the steering power transfer switchboard, refer to the manufacturer's instruction book.

The power supply feeder runs to the steering power transfer switchboard are located as follows:

Normal Supply - - Feeder runs aft from after ship's service switchgear group through starboard main wireway to steering power transfer switchboard.

Alternate Supply- Feeder runs aft from forward ship's service switchgear group through port main wireway to steering power transfer switchboard.

Emergency Supply- Feeder runs aft from after emergency switchboard along centerline on the second platform and thence up to steering power transfer switchboard.

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SEARCH AND RESCUE OF S-16 BY S-17 SQUADRON FOLLOWING
INCIDENTS DURING KANSAS WANE COLLISION 3 JUNE 1969

1. BRIEFING ROOM

SERIAL	AIRCRAFT	TIME OFF	PILOTS	OBSERVER AIRCRAWMAN	HOURS		REMARKS
					DAY	NIGHT	
1.	834	0305	CO	BILLY		0.55	ASN THEN SAR
2.	828	0250	WATSON WINTERFORD POOLE	WATSON		0.50	ASN THEN SAR
3.	830	0325	SP	SP		1.55	SAR
4.	828	0330	WATSON WINTERFORD POOLE	WATSON	0.40	1.30	SAR
5.	830	0920	WATSON WINTERFORD POOLE	WATSON	2.05		SAR
6.	828	0940	WATSON WINTERFORD POOLE	WATSON	21.5		SAR
7.	825	0725	WATSON WINTERFORD POOLE	WATSON	2.30		SAR
8.	830	0725	CO POOLE	WATSON	2.25		BODY TO KEARSARGE - SAR
9.	819	0820	SP WATSON	WATSON	0.20		SAR-A/C U/S
10.	834	0820	WATSON WINTERFORD POOLE	WATSON	2.00		SAR
11.	828	0900	WATSON WINTERFORD POOLE	WATSON	3.30		RETURN DOCTORS THEN SAR PHOTOGRAPHY
12.	830	0950	WATSON WINTERFORD POOLE	WATSON	.30		
13.	812	1220	WATSON WINTERFORD POOLE	WATSON	2.30		SAR
14.	828	1230	WATSON WINTERFORD POOLE	WATSON	2.30		TRANSFER TRACKER CREW TO KEARSARGE THEN SAR
15.	830	1435	WATSON WINTERFORD POOLE	WATSON	3.35		TRANSFER KEARSARGE THEN SAR
16.	812	1450	WATSON WINTERFORD POOLE	WATSON	1.00		SAR - RETURNED U/S
17.	818	1605	CO WATSON	WATSON	1.45		TRANSFERS
18.	834	1620	WATSON WINTERFORD POOLE	WATSON	1.45		SAR
TOTAL HOURS					29.20	5.10	

2. DETAILS

- Aircraft numbers 828 and 830 are SAR configured aircraft, all others are ASN.
- Prior to the collision two aircraft and crews were on alert 30 in the Briefing room from 022200Z, and were airborne from 030400Z on A/S screening.
- Serials 1 and 2 were on screening stations at the time of collision and were recalled for Search and Rescue duties.
- Serials 3 and 8 each had a qualified SAR Diver in the cabin crew, while subsequent serials were crewed by observers and/or aircrewmembers with a SAR Diver standing by in the briefing room.
- Serials 1 and 3 each recovered one survivor.
- Squadron pilots were supplemented by the Carrier Air Group Commander and LEUT Buchanan, while three S16 Squadron aircrewmembers flew as cabin crew.

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EXHIBIT 78

ENCLOSURE (4)

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3. SEARCH AREAS

Initially all helicopter searches were searching close to the datum position. At 0400 search sectors were shifted relative to RMS MELBOURNE. At 0500 there were seven helicopters searching, two from MELBOURNE and five from USS Kearsarge. At approximately 0600 the search sectors were changed to 90° sectors based on the datum position to a depth of five miles and at 1400 the search was extended to ten miles.

4. NARRATIVES

Narratives of the first six serials are included, plus brief narratives of other serials when anything of significance occurred.

(a) Serial 1

- 0317G Ordered by 1400 to return to MELBOURNE.
- 0318 Informed that MELBOURNE had been in a collision and to search the area for survivors. Wessex 623 (Serial 2) also joined, 623 searching the port side and 834 the starboard. The aircrewman moved to the winning position using an Aldis lamp for illumination.
- 0323 Commenced search. The scene was a mess, lights were everywhere and what looked like a destroyer (alongside) the starboard quarter of MELBOURNE. The pilot then noted that MELBOURNE'S bow was crumpled.
- 0324 Survivors were sighted in the water. The aircrewman spotted one man with his head down in the water and the observer prepared to lower the aircrewman to assist. However the pilot moved off to assist some sailors who appeared to be in trouble.
- 0330 Successfully winched a man (believed to be the Executive Officer) into the aircraft but the aircraft was too heavy to lift other survivors who began to swim toward it.
- 0333 Landed on MELBOURNE and disembarked survivor and aircrewman in order that the aircraft could pick up more survivors.
- 0334 Airborne again and as by now there were two other helos close together over the scene began a perimeter search to starboard of the area at a height of 30-50'. No more survivors were sighted and aircraft landed on at 0400.

Serial 2

- 0316G Ordered to return to MELBOURNE who had been in a collision and to search for survivors. Aircraft searched astern of MELBOURNE and sighted a twenty man lifeboat with survivors and also three survivors swimming in the near vicinity. A boat was directed to the scene by the aircraft landing lamp as this helo was not fitted with a winch.
- 0330 Landed on.

Serial 3

Wessex 630 was scrambled immediately after the collision and became airborne at 0327. The aircraft proceeded to the search area on MELBOURNE'S port quarter and sighted several boats in the water but no survivors. At this time there were four Wessex searching a small area and the crew elected to search a little beyond the wreckage perimeter. At approximately 0340 a survivor was sighted 300 yards from the area, away from MELBOURNE and as he appeared quite exhausted the Observer elected to lower the SAR diver for a double lift pick up. This was accomplished in about five minutes after which the survivor was landed on MELBOURNE and taken by stretcher to the sick bay. It was later learned that he suffered no injury, and it is believed that he was the last man rescued from the water.

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- 3 -

830 then rejoined the search and at 0400 was allocated a search sector relative to MELBOURNE on the starboard side from beam to bow. This area was clear of debris, and in spite of an intensive search for the next 1½ hours no other survivors were sighted.

Serial 4

- 0335G Airborne to search the wreckage area off MELBOURNE'S port quarter. Some wreckage was seen but no survivors. SH3 helos from KEARSARGE joined in the search and the aircraft was allocated a search sector from MELBOURNE'S port beam to bow. The search was carried out at 50-100' at 30 knots using the landing lamp and Aldis lamp for illumination.
- 0445 On SH3 reported a body about 500 yards on MELBOURNE'S port beam and we joined but saw nothing. A cutter entered the area to continue the search, and the aircraft continued searching it's sector.
- 0515 Ordered to make a close inspection of MELBOURNE'S bow and give a detailed damage report.
- 0535 Landed on Observer and Pilot reporting damage to CMDR(E) and the ABCDO.

Serial 5

- 0524 Airborne to search on port side of MELBOURNE
- 0540 Directed to search a sector 000 to 060 to a depth of 5 miles from the datum which was 300/3600 yards from MELBOURNE.
- 0650 New sector allocated 300-060 to 5 miles from the datum.
- 0725 Land on. No wreckage was sighted nor any sign of a survivor during this flight.

Serial 6

- 0540 Airborne, ordered by FLYCO to search all round datum to a depth of 1½ miles. Continued on this search sighting only insignificant debris until land on at 0755.

Serial 14

- 1230 Take of transfer of 323 crew to KEARSARGE
- 1250 Commenced search
- 1255 Assisted SH3 305 which was hovering over an object. SAR diver was lowered and recovered a large plastic lid.
- 1315 Recovered plastic bag containing solar still from water
- 1440 Picked up 3' diameter wooden disc painted white with four black crosses
- 1500 Landed on

Serial 15

After one transfer to 100 yards from datum commenced sector search, sectors 270 to 090 to a depth of 10 miles from datum. At about 1600 some small items which looked like identification marks were sighted and the General was

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(When Completed)

817 SQUADRON A/S EXERCISE
DE-BRIEFING FORM

"A" - VITAL STATISTICS

Exercise No.	Date	Crew	Aircraft
FX 39	1/6/4	BARONOV STANFORD INTERFLIGHT	825

Type of Exercise or Task :-
SCREENING
H.S.C.S.:
FLIGHT.

Take-Off	On Task	Off Task	Lost On
20052	20052	20052	

Totals	Day	Night
		- 25

Reasons for Deviation from Ordered Times :-
COLLISION.

All Unserviceabilities (including cabin pyrotechnics):
NA.

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(When Completed)

79

EXHIBIT 49

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ENCLOSURE (7)

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(When Completed)

817 SQUADRON A/S EXERCISE
DE-BRIEFING FORM

"B" - NARRATIVE

(Include Ball Depths in each Dip and all MADVECS and VECTACS)

TIME		Leave this Column Blank
2005	AIRBORNE.	
2009	IN DIP (270°-3000° FROM BX CENTRE.	
2010 A	SALL DEPTH 60' FM. RETURN TO MOTHER	
2012 16	FM RETURN TO MOTHER - WE HAVE BEEN IN A COLLISION.	
2012 16	BREAK UP - RECOVERED MOTHER. TOLD TO SEARCH FOR SURVIVORS ASTERN OF MOTHER. SIGHTED 20 MIRN LIFE RAFT WITH SURVIVORS - ALSO 3 SURVIVORS SWIMMING IN AREA VICINITY. DIRECTED BOAT 34 LANDING LADGE TO SURVIVORS. COULD NOT PICK UP SURVIVORS WITH HELD AS NO WIRTH FITTED.	
2030	LANDED ON.	

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(When Completed)

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AD 176 0208

RTTCZYUW RUMHBYAU209 1760642-CCCC--RUMHBYA.
DE PANYG 024 25/0546Z

ZNY CCCCC

R 250526Z

FM FOCAP

TO COMNAVJASE SOUTIC

P 310743Z MAY 69

FM USS FRANK E EVANS

TO HMAS MELBOURNE

BT

SEATO ~~CONFIDENTIAL~~ (PX-39)

EXERCISE SEA SPIRIT

TG7TF BCST (U)

A. YOUR 310050Z MAY 69

1. EVANS HAS HAD NO DIFFICULTY COPYING SUDJ BCST ON 2150KHZ. CONSIDER
OLH 4170KHZ (RLF A) WILL PROVIDE GOOD BACK-UP FOR BCST. HOWEVER EVANS
HAS NOT UTILIZED OLH FREQ AS YET.

2. AT PRESENT WE HAVE NO MISSING DELTA HRS. CONSIDER CKT DISCIPLINE
RELIABILITY HAS GREATLY IMPROVED PAST 2 DAYS

BT

310743Z MAY 69/60

NNNNZ

Exhibit 80

~~CONFIDENTIAL~~

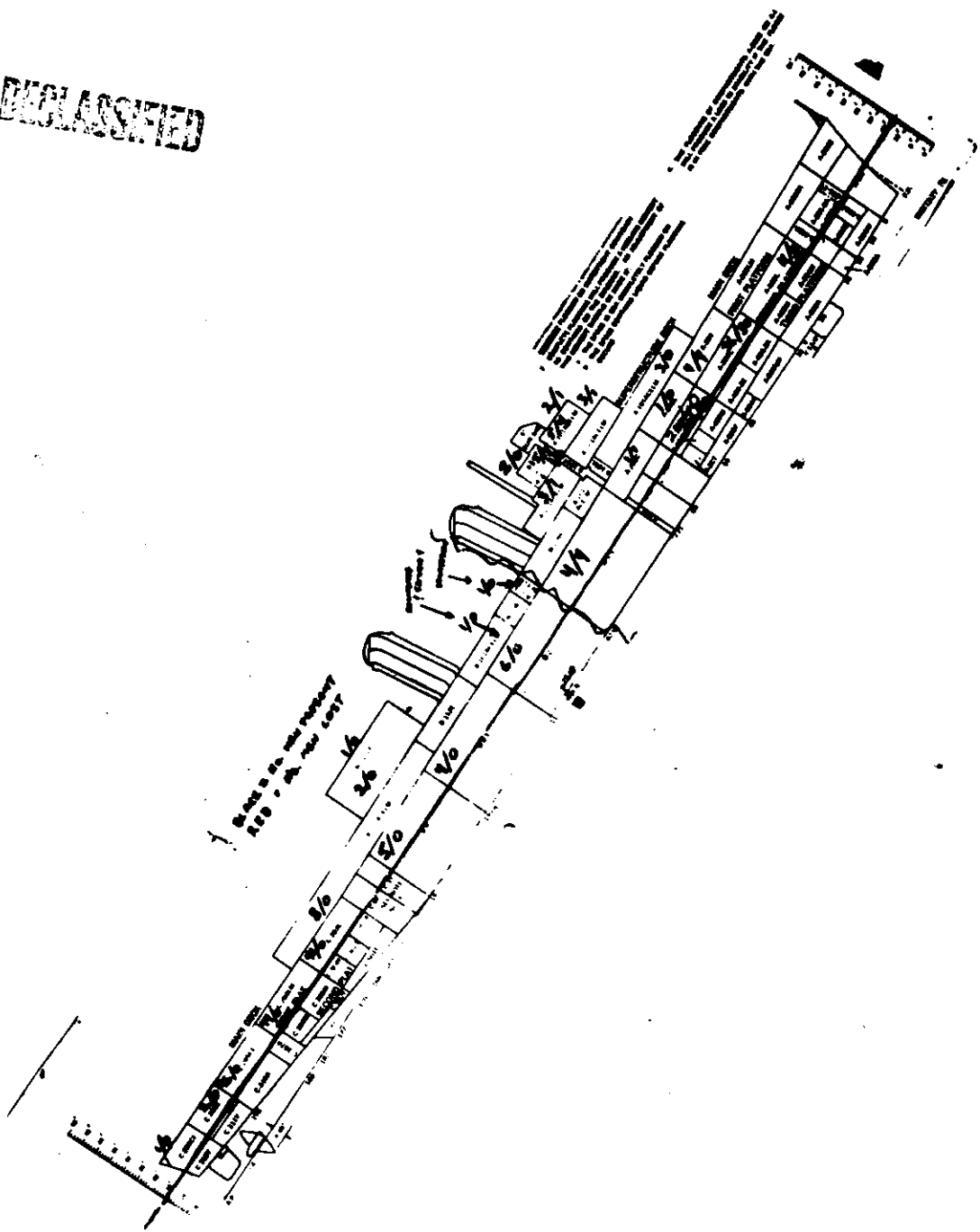
PHILDER 2100/7 (9-66) 0107-001-3000

EXHIBIT 80

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ENCLOSURE (80)

DECLASSIFIED



DECLASSIFIED

ENCLOSURE (8)