

RESTRICTED

~~CONFIDENTIAL~~

~~SERIAL NUMBER~~ 17

GENERAL INFORMATION BOOK

DESTROYERS DD421 AND DD422
U.S.S. BENSON AND MAYO

Information relative to Hull items under the cognizance
of the Bureau of Ships, Navy Department, Washington, D. C.

Office Of
Supervisor of Shipbuilding, U.S.N.
Bethlehem Steel Company
Quincy, Massachusetts

1940

SECTION A-1

GENERAL

Draft 11' 9" is the normal waterline, namely, that which corresponds to trial displacement. Trial displacement with 2/3 maximum reserve feed water, fuel oil, and diesel oil is 2,030 tons.

The forward perpendicular (F.P.) is located 2 inches aft of the extreme forward end of the waterline as defined above.

The after perpendicular (A.P.) is located 2 7/16 inches forward of the extreme after end of the waterline as defined above.

The middle perpendicular (M.P.) is located midway between the forward and after perpendiculars which is 12" forward of frame 98.

The molded base line (B.L.) is located 15/16" above the bottom of keel amidship.

Drafts, are measured from the bottom of the keel amidship extended forward and aft.

PROJECTIONS BELOW BOTTOM OF KEEL					
Description		Pro- jection Below Bottom of Keel	Frame	From C.L.	Port or Stbd
Propeller	DD421	4' 0 1/2"	185	8'6"	P
	DD422	3' 11 9/16"	185	8'6"	P
Propeller	DD421	4' 0 1/2"	185	8'6"	S
	DD422	3' 11 9/16"			
Rudder	DD421	17 1/2" Ford.	188-194		C.L.
	DD421	17 1/8" Aft.	188-194		C.L.
	DD422	17 1/2" Ford.	188-194		C.L.
	DD422	17 1/8" Aft.	188-194		C.L.
Rotating Supersonic Transceiver	DD421	(See Note Below)			
	DD422		24-25	18"	P&S

Note: The bottom of the projector for the Supersonic Transceiver, when in operating position, is 28 9/16" below bottom of keel.

SECTION A-1
GENERAL (Cont'd.)
PROPELLING MACHINERY

BOILERS

Number	Manufacturer	Type	Designed Working Pressure
4	The Babcox and Wilcox Co.	Express	618 #/Sq Inch

TURBINES

Number	Manufacturer	Type	Number of Stages or Expansions	Designed R.P.M.
2 High Pressure	Bethlehem Steel Co.	Impulse Reaction	1 Stage	6000
2 Low Pressure	Bethlehem Steel Co.	Reaction	14 25 Expansions	2300
2 Astern	Bethlehem Steel Co.	Impulse	2 Stages	2000

PROPELLERS

No.	Type	Mfgr.	No. of Blades	Dia.	Pitch	Shaft. Dia.	Des. RPM	Des. RPM
2 Orig.	Solid	Beth. Steel Co.	3	11'3"	12'4 1/2"	15 1/4	380	(Total 2 Shafts) 50,000

Complete information and instructions concerning the propelling machinery may be ascertained from the "General Operating Instructions covering Special Features of Machinery Installation", which is furnished the vessel by the contractor in accordance with the requirements of the General Specifications for Machinery.

SECTION A-1

GENERAL (Cont'd.)

PRINCIPAL DIMENSIONS OF HULL



	DD421	DD422
Length Overall	348' 1 13/16"	347' 10"
Length Between Perpendiculars	340' 11 3/16"	340' 8 5/8"
Extension of Vessel Beyond F.P.	4' 10 15/16"	4' 8 3/4"
Extension of Vessel Beyond A.P.	2' 3 11/16"	2' 4 5/8"
Breadth Molded Max., at Trial		
Disp. 11' 9" W.L. Bet. Frs. 107-110	35' 9 1/4"	35' 9 1/4"
Breadth Outside of Plating Max. Between Frames 110 and 111, 15'-3" Above Bottom of Keel	Port 18'-0 11/16" Stbd. 18' 1"	18' 0 1/16" 18' 1"
Depth Molded at Center Line to Main Deck at Middle Perpendicular (Designed)	20' 7 7/8"	20' 7 7/8"
Midship Section (At M.P.)	12" Ford. Fr. 98	12" Ford. Fr. 98
Freeboard at Bow	20' 3 3/8"	20' 5 5/8"
Freeboard at Stern	9' 7"	9' 7 3/4"
Displacement, Standard-Tons (Designed)	1620	1620
Displacement Trial With 2/3		
Maximum Reserve Feed Water, Fuel Oil and Diesel Oil-Tons	2030	2030

Note: Above Dimensions Are Surveyed, Except as Noted.

FRAME SPACING

Frames are numbered from the forward perpendicular (F.P.) it being frame "0", to the after perpendicular, which is 18" aft of frame 194.

Complete transverse frames do not exist at all of the intermediate numbered locations as the principal framing of this vessel is longitudinal.

Frame spacing is 21 inches throughout.

SECTION A-1

GENERAL (Cont'd.)

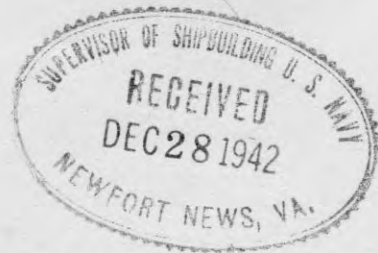
MISCELLANEOUS DATA

Inclination of Propeller Shafts	DD421	DD422
Port Shaft Vertical Rake	.750 Per Ft.	.750 Per Ft.
Port Shaft Horizontal Rake	None	None
Stbd. Shaft Vertical Rake	.4711 Per Ft.	.4711 Per Ft.
Stbd. Shaft Horizontal Rake	None	None
Area of Rudder (Projected)	86.10 Sq. Ft.	86.10 Sq. Ft.
Center of Forward Mast From F.P. at Main Deck	123' 2 11/32"	123' 2 11/32"
Length of Signal Yard (Between Speed Cone Eyes)	21' 0"	21' 0"
Axis of Gun #1 From F.P.	52' 9"	52' 9"
Axis of Gun #2 From F.P.	75' 3"	75' 3"
Axis of Gun #3 From A.P.	106' 3"	106' 3"
Axis of Gun #4 From A.P.	70' 0"	70' 0"
Axis of Gun #5 From A.P.	43' 9"	43' 9"

Above are Designed Dimensions

HEIGHTS ABOVE WATERLINE AT 11' 9" DRAFT

Main Battery	DD421	DD422
Axis of 5" Gun No. 1	25' 0 7/16"	25' 0 5/8"
Axis of 5" Gun No. 2	32' 1 1/8"	32' 1 1/8"
Axis of 5" Gun No. 3	23' 1 15/16"	23' 1 15/16"
Axis of 5" Gun No. 4	23' 1 11/16"	23' 1 13/16"
Axis of 5" Gun No. 5	15' 10 9/16"	15' 10 1/2"
Secondary Battery		
Axis of .50" Cal. Mach. Gun, No. 1	29' 9 1/8"	29' 9 3/4"
Axis of .50" Cal. Mach. Gun, No. 2	29' 8 7/8"	29' 9 3/8"
Axis of .50" Cal. Mach. Gun, No. 3	46' - 10"	46' - 10"
Axis of .50" Cal. Mach. Gun, No. 4	46' - 10"	46' - 10"
Axis of .50" Cal. Mach. Gun, No. 5	22' - 7"	22' - 7"
Axis of .50" Cal. Mach. Gun, No. 6	22' - 7"	22' - 7"
Axis of .50" Cal. Mach. Gun, No. 7	23' - 4"	23' - 4"
Axis of .50" Cal. Mach. Gun, No. 8	23' - 4"	23' - 4"
Axis of .50" Cal. Mach. Gun, No. 9	22' - 4"	22' - 4"
Axis of .50" Cal. Mach. Gun, No. 10	22' - 4"	22' - 4"



SECTION A-1

GENERAL (Cont'd)

HEIGHTS ABOVE WATERLINE AT 11' 9" DRAFT (Cont'd)

Torpedo Tubes	DD421	DD422
21" Gun Triple Mount No. 1 Ford.	19' - 10 1/4"	19' - 9 7/8"
Battery Control and Observation Features		
Centerline, 5" Gun Director	54' - 6 1/4"	54' - 5 3/8"
Centerline Torpedo Director Eye Piece, Port	40' - 5 3/8"	40' - 6 5/8"
Centerline Torpedo Director Eye Piece, Starboard	40' - 7"	40' - 7"
Centerline 36" Searchlight	26' - 9"	26' - 10 1/4"
Centerline 24" Searchlight <u>g</u>	45' - 11"	46' - 1"
Navigation and Signal Features		
Top of Flag and Pennant Staff Cap	40' - 6 1/2"	40' - 6 1/2"
Highest Point of Mast (Top of Truck Light)	82' - 8"	82' - 7"
Centerline of Truck Light on Mast, Red	82' - 4"	82' - 3 1/4"
Centerline of Truck Light on Mast, White	81' - 11"	81' - 10 1/4"
Centerline of Signal Yard on Mast	75' - 5 1/2"	74' - 6 1/4"
Centerline of Towing Light Upper	47' - 4 1/2"	47' - 3 1/8"
Centerline of Towing Light Lower	41' - 4 1/2"	41' - 3 5/8"
Centerline of Mast Head Light	53' - 9 1/4"	53' - 3 1/8"
Centerline of Range Light	78' - 0"	72' - 8 3/4"
Centerline of Speed Light	29' - 6"	29' - 3 1/4"
Centerline of Wake Light	13' - 4"	13' - 6 1/4"
Centerline of 12" Signal Searchlight, Port	39' - 2 1/2"	39' - 1"
Centerline of 12" Signal Searchlight, Stbd.	39' - 1"	39' - 1 1/2"

SECTION A-1

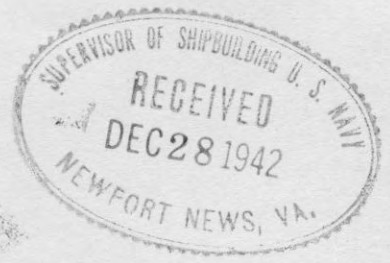
GENERAL (Cont'd)

HEIGHTS ABOVE WATERLINE AT 11' 9" DRAFT (Cont'd)

Miscellaneous	DD421	DD422
Top of Ford. Smoke Pipe-Ford. End of Pipe	43' - 4 5/8"	43' - 5 1/4"
Top of Ford. Smoke Pipe-Over Hood	48' - 4 7/8"	48' - 7"
Top of Aft Smoke Pipe-Ford. End of Pipe	39' - 6 5/8"	39' - 6 1/4"
Top of Aft Smoke Pipe-Over Hood	44' - 6 7/8"	44' - 7"
Decks, Platform, and Bridges		
*2nd Platform at Fr. 45	7' - 9 1/16"	7' - 8 1/16"
*1st Platform at Fr. 67	13' - 10 15/16"	13' - 11 1/16"
*1st Platform at Fr. 139	12' - 4 9/16"	12' - 4 5/16"
*1st Platform at A.P.	13' - 11 5/16"	14' - 0 5/16"
Main Deck at Stem	11' - 7 3/8"	11' - 7 3/4"
Main Deck at M.P.	9' - 0 1/2"	9' - 0 5/8"
Main Deck at A.P.	9' - 6"	9' - 6"
Foscle. Deck at Stem	20' - 3 3/8"	20' - 5 5/8"
Foscle. Deck at Fr. 67	16' - 11 3/4"	17' - 0"
Superstructure Deck at Fr. 67	24' - 5 3/8"	24' - 5"
Top of After Deck House at Fr. 141	16' - 1 7/8"	16' - 2 3/4"
Top of Searchlight Platform at Fr. 120	23' - 2"	23' - 2"
Top of General Workshop	16' - 6 1/4"	16' - 6"
Navigating Bridge at Fr. 67	34' - 2 1/2"	34' - 2 1/2"
Pilot House Top at Fr. 67	41' - 7 3/4"	41' - 7 3/4"
Ford. end of Pilot House	41' - 9"	41' - 7 3/4"

Note: Above Dimensions are Surveyed

* Heights Above Bottom of Keel



SECTION A-1

GENERAL (Cont'd.)

STABILITY AND BALLASTING

FOR INFORMATION AS TO STABILITY AND BALLASTING UNDER VARIOUS CONDITIONS, SEE THE "BOOKLET OF INCLINING EXPERIMENT DATA" AND THE "DAMAGE CONTROL BOOK".

Run No.	Inclining Angle	Condition	Stability	Ballasting	Remarks
1	5°	Level	20	0	Level
2	5°	Level	22	0	Level
3	5°	Level	24	0	Level
4	5°	Level	26	0	Level
5	5°	Level	28	0	Level

Run No.	Inclining Angle	Condition	Stability	Ballasting	Remarks
6	5°	Level	30	0	Level
7	5°	Level	32	0	Level
8	5°	Level	34	0	Level
9	5°	Level	36	0	Level
10	5°	Level	38	0	Level

SECTION A-5
 ORDNANCE AND ORDNANCE OUTFIT
 BATTERY

5" Guns

Gun Number	Bore	Cal.	Location			Elev.	De-press	Train	Remarks
			Deck	Frame	Side				
1	5"	38	Focle.	30	Ø	85°	15°	300°	Enclosed
2	5"	38	Super.	43	Ø	85°	15°	300°	Enclosed
3	5"	38	After Deck House Top	134	Ø	85°	15°	280°	Enclosed Type with Open Turret
4	5"	38	After Deck House Top	155	Ø	85°	15°	300°	Enclosed Type with Open Turret
5	5"	38	Main	170	Ø	85°	15°	300°	Enclosed

0.50" Anti-aircraft Machine Guns

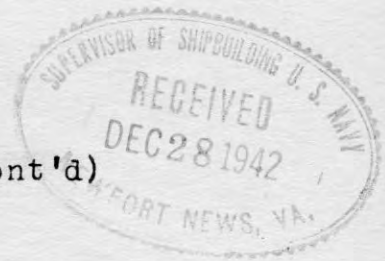
Gun Number	Bore	Cal.	Location			From Ø of Ship	Elev.	De-press	Train
			Deck	Frame	Side				
1	.50"	63.8	Super-structure Deck	53	S	5'-4"	80°	15°	360°
2	.50"	63.8	Super-structure Deck	53	P	5'-4"	80°	15°	360°
3	.50"	63.8	Top of Pilot House	59	S	5'-5"	80°	15°	360°
4	.50"	63.8	Top of Pilot House	59	P	5'-5"	80°	15°	360°
5	.50"	63.8	Top of Midship Deck House	108	S	8'-4"	80°	15°	360°

SECTION A-5

ORDNANCE AND ORDNANCE OUTFIT (Cont'd)

BATTERY

0.50" Anti-aircraft Machine Guns (Cont'd)



Gun Number	Bore	Cal.	Location			From Ship	Elev.	De-press	Train
			Deck	Frame	Side				
6	.50"	63.8	Top of Midship Dk. Hse.	105	P	9'-2"	80°	15°	360°
7	.50"	63.8	Top of Midship Dk. Hse.	121	S	12'-4"	80°	15°	360°
8	.50"	63.8	Top of Midship Dk. Hse.	121	P	12'-4"	80°	15°	360°
9	.50"	63.8	Top of After Dk. Hse.	144	S	10'-3"	80°	15°	360°
10	.50"	63.8	Top of After Dk. Hse.	144	P	10'-3"	80°	15°	360°

The train is designated as 360° since the Machine Gun can move 180° in both directions. It is restricted from moving further than 180° by the hoses of its cooling system.

SECTION A-5

ORDNANCE AND ORDNANCE OUTFIT (Cont'd)

TORPEDO TUBES (QUINTUPLE)

Torpedo Tube No.	Diameter Torpedo	Plan and Mark No.	Location			Train	
			Deck	Frame	Side	Forward	Aft
1	21"	Ordnance 217700 Mk. XIV Without Blast Shield	Top of Mid- ship Deck- house	93	Ø	45°	45°

A depth charge projector mark I, (Y-Gun) is located on the main deck at Frame 181.

A 5" Loading Machine Mark XVI is located on the main deck, between frames 124 and 127.