

# MODERN NAVAL WARFARE



## RECOGNITION GUIDE



**Revision:**  
**20260517212100**

The following credits refer to the production of this guide and not the referenced software.

Production Editor: Ioannis Maslarinos

Content Supervision: Dimitrios Maslarinos

Contact Contributors: Evangelos Vasilakis, Petros Daskalakis

Artwork Contributors: Konstantinos Lampropoulos, Christina Bantinou, Vasiliki Sakellakou



Published by Matrix Games Ltd. under license from WaveOps Ltd.

All rights reserved.

Modern Naval Warfare, its characters, names, and related indicia are trademarks of WaveOps Ltd. © 2026. All other trademarks are the property of their respective owners.

This is an official licensed product. No part of this book may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without written permission from the publisher.

# 1. SURFACE VESSELS

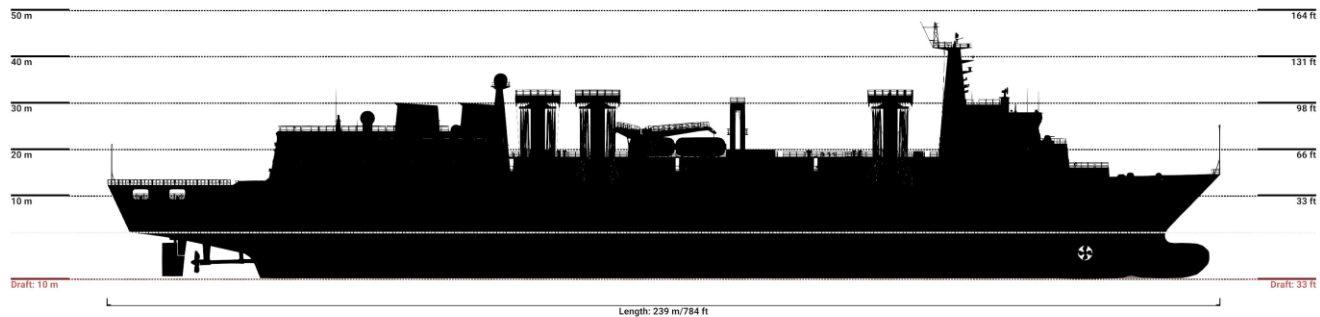


**THIS PAGE INTENTIONALLY LEFT BLANK**



**A** AOR - Type 901 Fuyu

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

Fast combat support ship designed to keep pace with carrier strike groups. It provides fuel, ammunition, and dry stores at sea.

**TYPE**

- Replenishment Oiler
- Crew: 200

**DIMENSIONS**

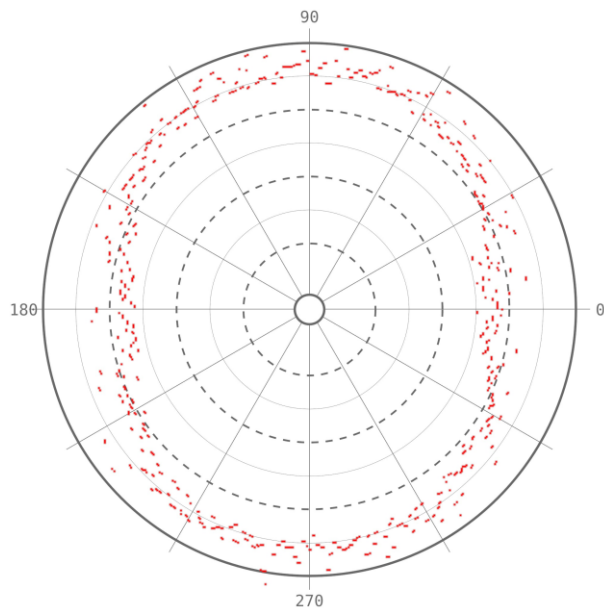
- Length: 239.0 m
- Beam: 32.0 m
- Draft: 10.0 m
- Displacement: 40000.0 tons

**SPEEDS**

- Max: 25.0 kts
- Cruise: 18.0 kts



RADAR RCS



**SENSORS**

- RADAR: Type 346 derivative / air search
- SONAR: -
- VISUAL: -
- EW: EW suite

**ARMAMENT**

- GUNS: 130 mm
- MISSILES: -
- TORPEDOES: -
- MORTARS: -
- DECOYS: Decoy systems
- CLOSE IN: HQ-10, Type 1130 CIWS
- AIRCRAFT: 2x Z-8 / Z-9 utility

**MACHINERY**

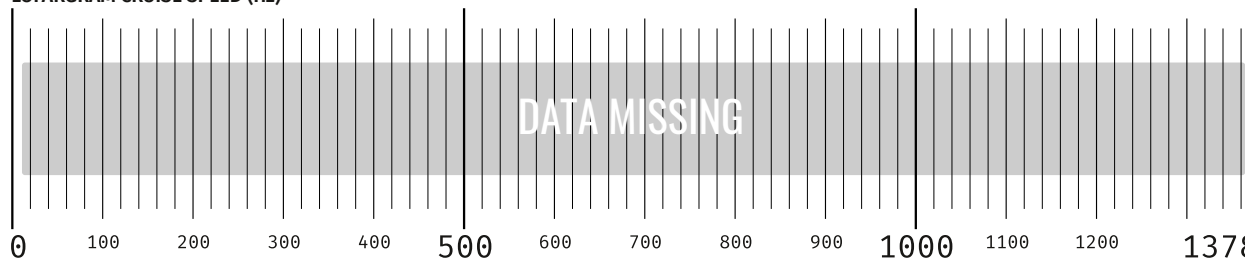
ENGINE(S)

- 4x QC-280 gas turbines
- Cycles: -, Cylinders: -
- Power: 4x 26 700 kW (36 300 shp)
- CMP: COGAG, Gear ratio: 24:1
- Engine RPM: 3600

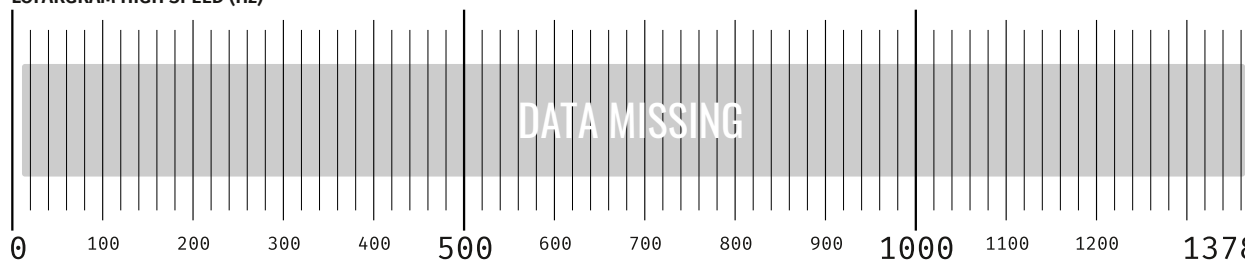
SHAFT(S)

- #: 2
- Blades: 5,  $\phi$ : 4.9 m
- Shaft RPM: 150

LOFARGRAM CRUISE SPEED (Hz)

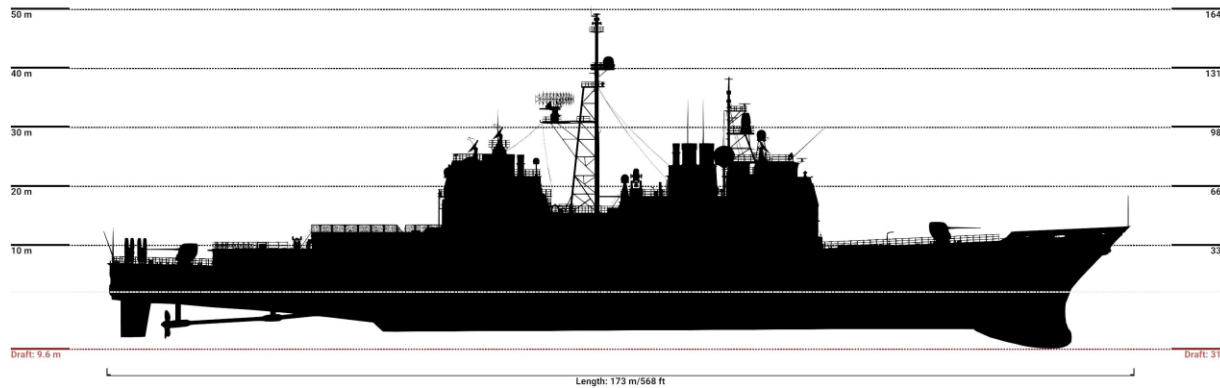


LOFARGRAM HIGH SPEED (Hz)



# A CG - Ticonderoga Baseline 2

## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



### SPECIFICATION

Guided-missile cruiser featuring the Aegis Combat System and the first iteration of the Mk 41 Vertical Launch System (VLS).

#### TYPE

- Guided Missile Cruiser
- Crew: 340

#### DIMENSIONS

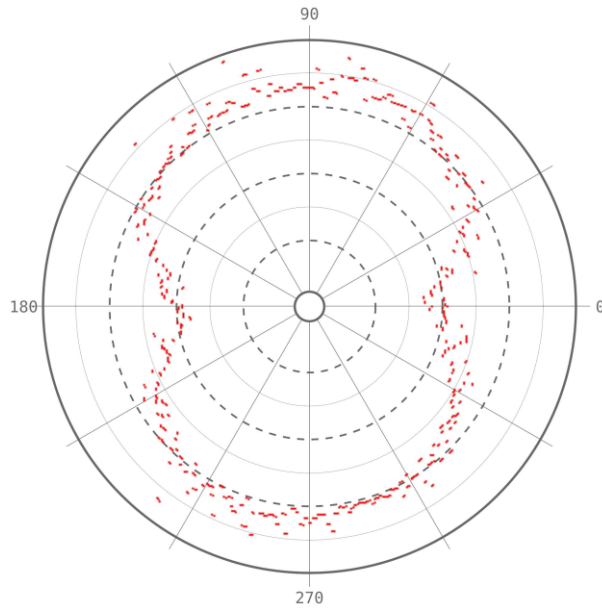
- Length: 173.0 m
- Beam: 16.8 m
- Draft: 10.2 m
- Displacement: 8500.0 tons

#### SPEEDS

- Max: 32.5 kts
- Cruise: 20.0 kts



RADAR RCS



**SENSORS**

- RADAR: AN/SPY-1A/B (Aegis)
- SONAR: SQS-53 hull sonar
- VISUAL: -
- EW: SLQ-32 EW suite

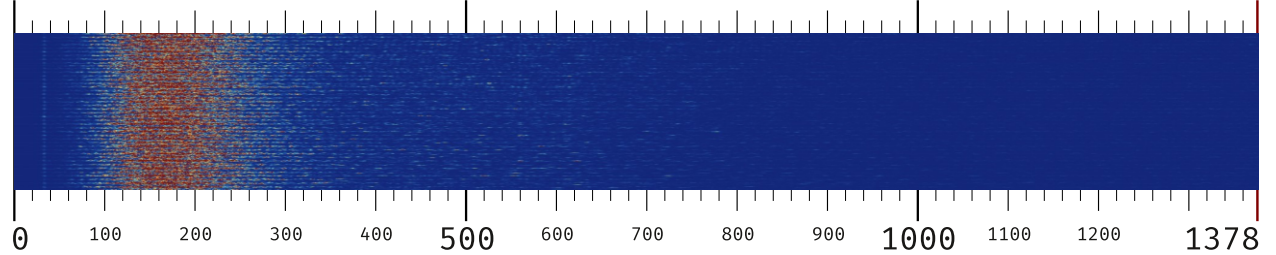
**ARMAMENT**

- GUNS: 2x Mk 45 5-inch/54
- MISSILES: 122x VLS cells (SM-2/3/6, Tomahawk, ESSM, ASROC)
- TORPEDOES: 2x triple 324 mm
- MORTARS: -
- DECOYS: 2x Mk 36 SRBOC, SLQ-25 Nixie
- CLOSE IN: 2x Phalanx CIWS
- AIRCRAFT: 2x MH-60 (embarked)

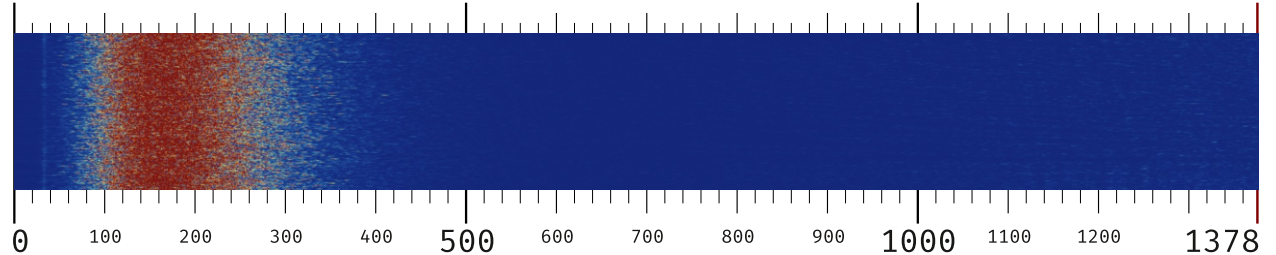
**MACHINERY**

- ENGINE(S)**
- 4x General Electric LM2500 gas turbines
  - Cycles: -, Cylinders: -
  - Power: 4x 22 000 kW (29 900 shp)
  - CMP: COGAG, Gear ratio: 20:1
  - Engine RPM: 3600
- SHAFT(S)**
- #: 2
  - Blades: 5,  $\phi$ : 5.2 m
  - Shaft RPM: 180

LOFARGRAM CRUISE SPEED (Hz)

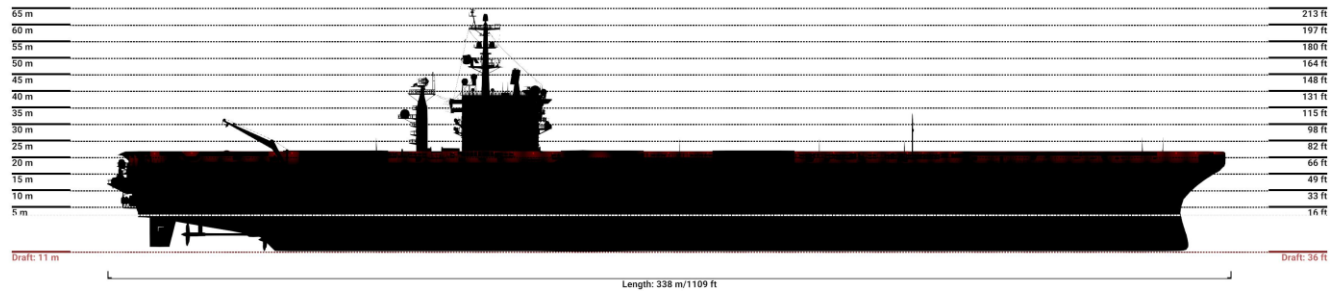


LOFARGRAM HIGH SPEED (Hz)



**A** CVN - Nimitz

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

Nuclear-powered aircraft carrier. The backbone of US power projection, capable of embarking a full carrier air wing (CVW).

**TYPE**

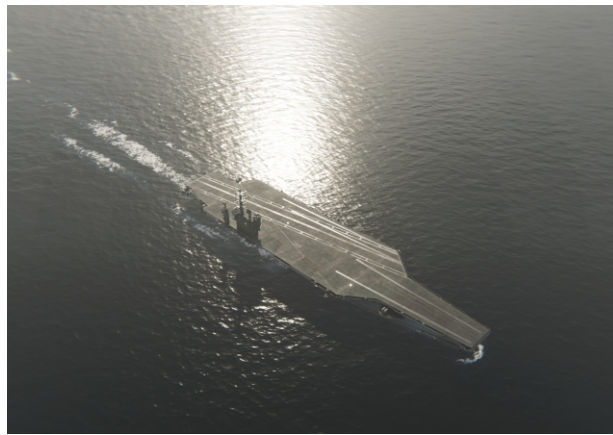
- Aircraft Carrier (Nuclear-Pulsion)
- Crew: 5000

**DIMENSIONS**

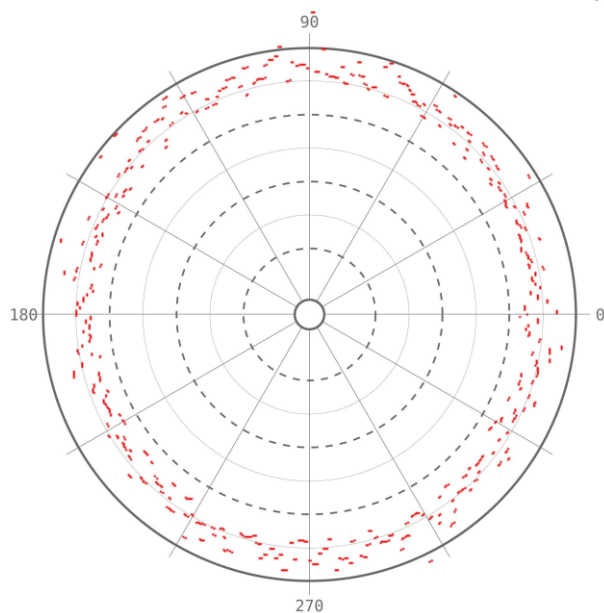
- Length: 338.0 m
- Beam: 40.8 m
- Draft: 11.3 m
- Displacement: 78000.0 tons

**SPEEDS**

- Max: 30.0 kts
- Cruise: 22.5 kts



RADAR RCS



**SENSORS**

- RADAR: AN/SPY-49/shipboard air search radars
- SONAR: None (escort-dependent)
- VISUAL: -
- EW: SLQ-32 EW suite

**ARMAMENT**

- GUNS: -
- MISSILES: 3x8 Sea Sparrow
- TORPEDOES: -
- MORTARS: -
- DECOYS: Mk 36 SRBOC, SLQ-25 Nixie
- CLOSE IN: RAM, Phalanx CIWS
- AIRCRAFT: 70-90x fixed/rotary wing aircraft (F/A-18, E-2, MH-60 etc.)

**MACHINERY**

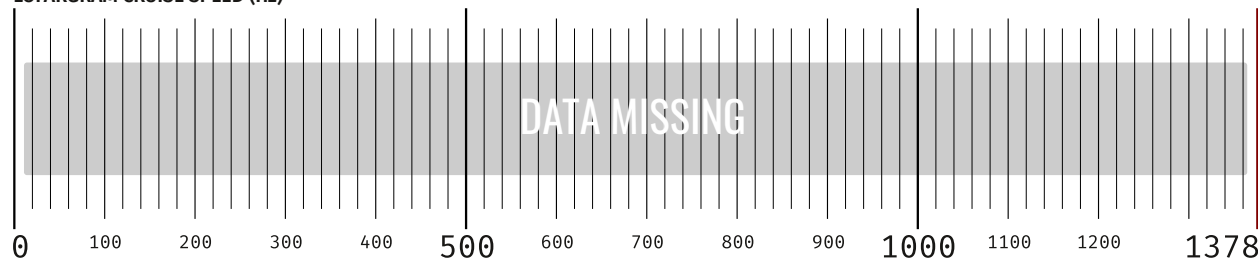
ENGINE(S)

- 2x Westinghouse A4W nuclear reactors and 4 General Electric steam turbines
- Cycles: -, Cylinders: -
- Power: 4x 51 850 kW (70 500 shp)
- CMP: CONAS, Gear ratio: 15:1
- Engine RPM: 3000

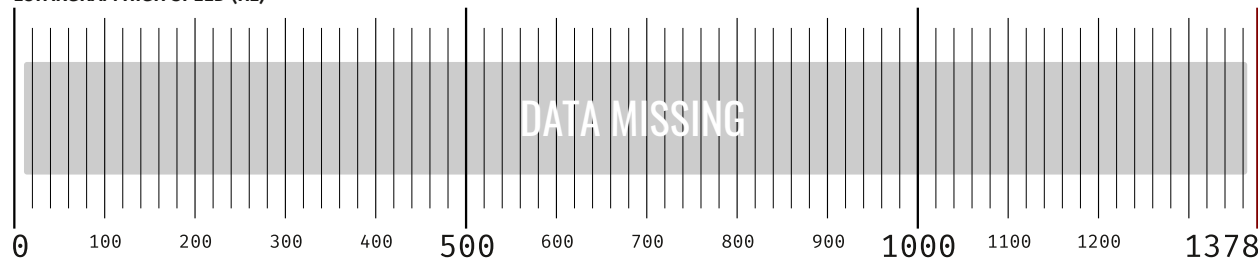
SHAFT(S)

- #: 4
- Blades: 5, Ø: 7.6 m
- Shaft RPM: 200

LOFARGRAM CRUISE SPEED (Hz)

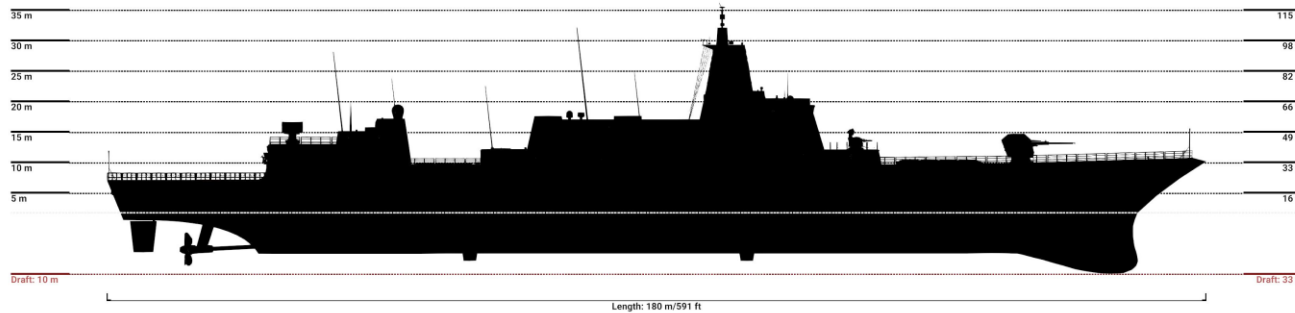


LOFARGRAM HIGH SPEED (Hz)



**A** DDG - Type 055 Renhai

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

Large guided-missile destroyer featuring 112 VLS cells and integrated dual-band radar for high-end carrier escort duties.

**TYPE**

- Guided missile destroyer
- Crew: 300

**DIMENSIONS**

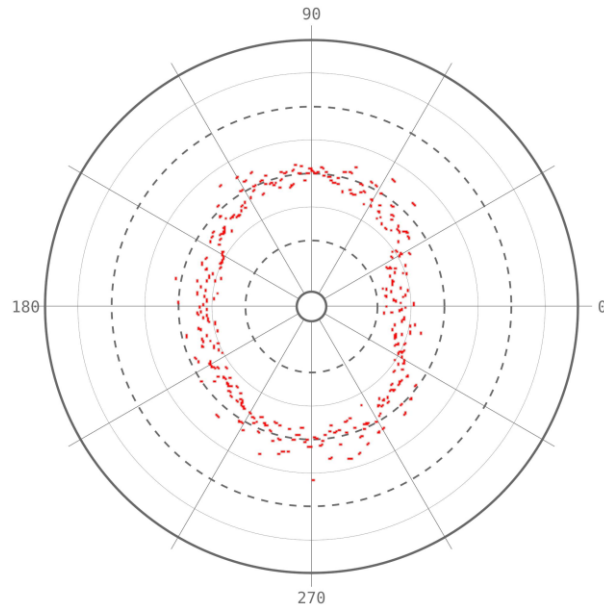
- Length: 180.0 m
- Beam: 20.0 m
- Draft: 10.0 m
- Displacement: 11000.0 tons

**SPEEDS**

- Max: 30.0 kts
- Cruise: 18.0 kts



RADAR RCS



**SENSORS**

- RADAR: Type 346B AESA (4-panel fixed)
- SONAR: hull sonar + towed array
- VISUAL: Integrated mast + IR/EO suite
- EW: Type 9210 Advanced EW suite

**ARMAMENT**

- GUNS: 130 mm
- MISSILES: 112x VLS cells (HHQ-9, YJ-18, CJ-10, CY-5)
- TORPEDOES: 2x triple 324 mm
- MORTARS: ASW rockets
- DECOYS: Type 726
- CLOSE IN: H/PJ-11 CIWS
- AIRCRAFT: 2x Z-20 / Z-9

**MACHINERY**

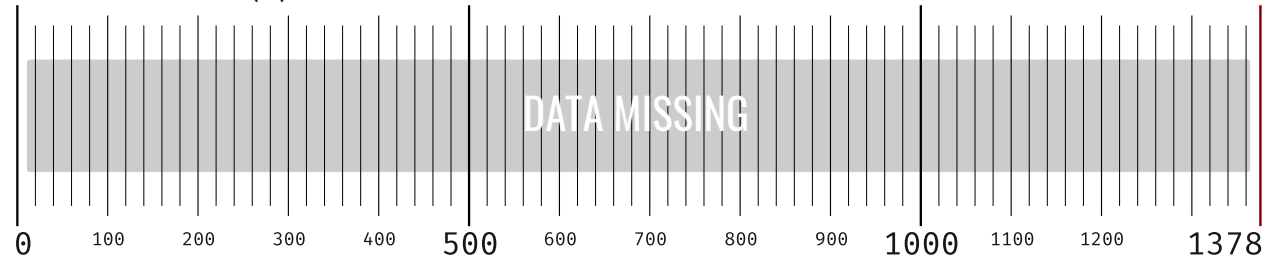
ENGINE(S)

- 4x QC-280 gas turbines
- Cycles: -, Cylinders: -
- Power: 4x 20 900 kW (28 400 shp)
- CMP: COGAG, Gear ratio: 18:1
- Engine RPM: 3820

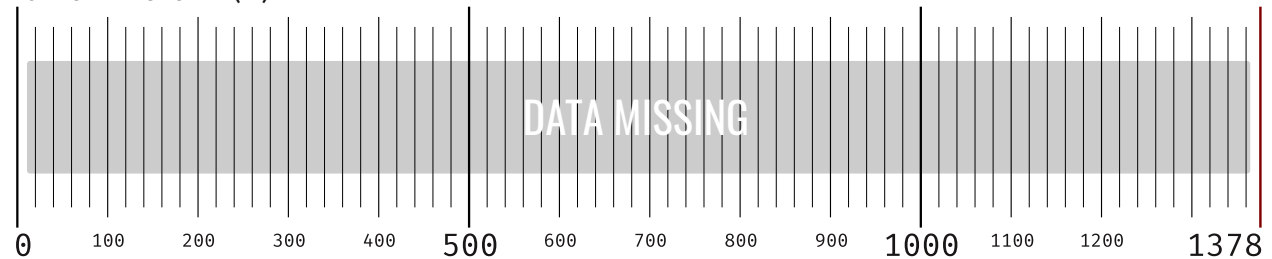
SHAFT(S)

- #: 2
- Blades: 5,  $\phi$ : 4.7 m
- Shaft RPM: 212

LOFARGRAM CRUISE SPEED (Hz)

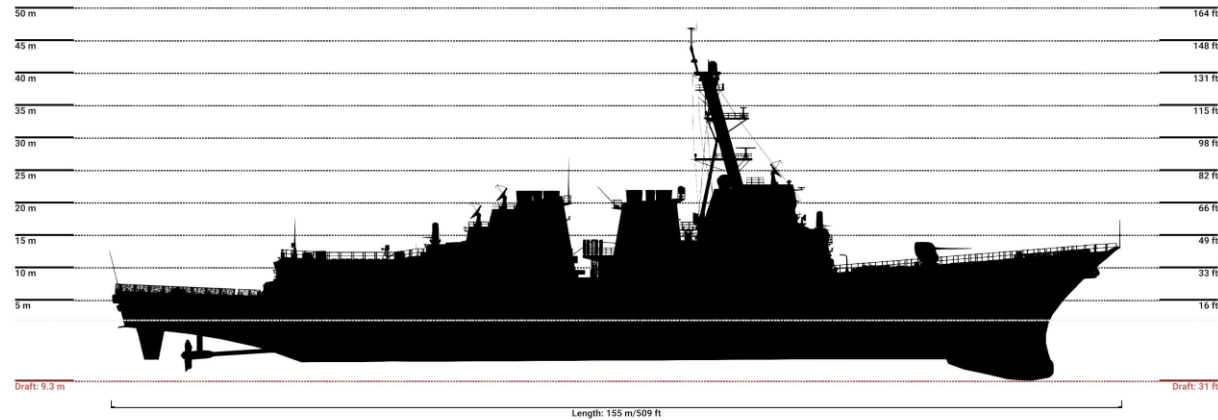


LOFARGRAM HIGH SPEED (Hz)



# A DDG - Arleigh Burke Flight IIA

## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## SPECIFICATION

Advanced multi-mission destroyer and workhorse of the US Navy. The flight IIA differentiates from previous flights by the inclusion of dual helicopter hangars and the Aegis BMD capability.

### TYPE

- Guided missile destroyer
- Crew: 300

### DIMENSIONS

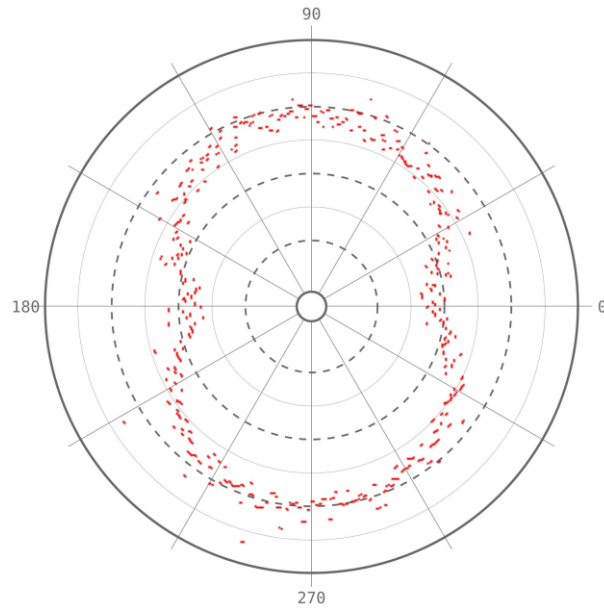
- Length: 155.3 m
- Beam: 20.0 m
- Draft: 9.4 m
- Displacement: 6900.0 tons

### SPEEDS

- Max: 30.0 kts
- Cruise: 20.0 kts



RADAR RCS



**SENSORS**

- RADAR: AN/SPY-1D(V)
- SONAR: AQS-53 hull sonar + towed array (some variants)
- VISUAL: -
- EW: SLQ-32(V) EW suite

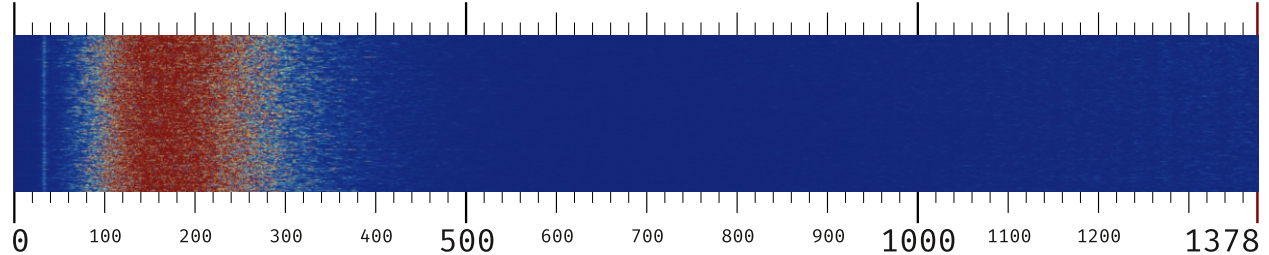
**ARMAMENT**

- GUNS: Mk 45 5-inch/62
- MISSILES: 96x VLS cells (SM-2/3/6, Tomahawk, ESSM, ASROC)
- TORPEDOES: 2x triple 324 mm
- MORTARS: -
- DECOYS: Mk 36 SRBOC, SLQ-25 Nixie
- CLOSE IN: ESSM, Phalanx CIWS
- AIRCRAFT: 2x MH-60

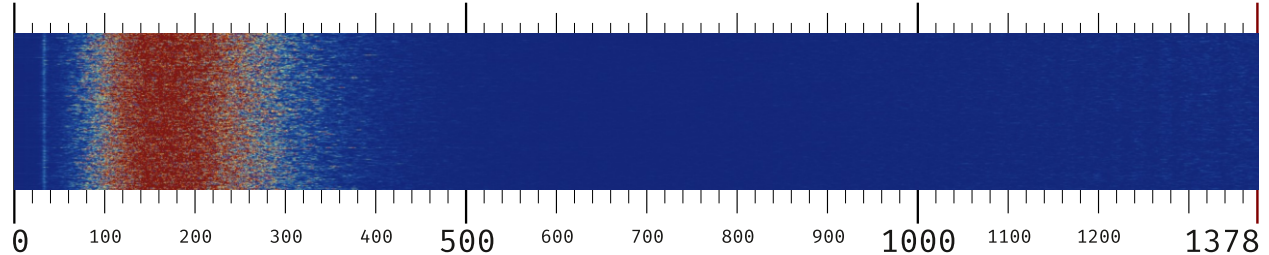
**MACHINERY**

- ENGINE(S)**
- 4x General Electric LM2500 gas turbines
  - Cycles: -, Cylinders: -
  - Power: 4x 25 000 kW (34 000 shp)
  - CMP: COGAG, Gear ratio: 18:1
  - Engine RPM: 3600
- SHAFT(S)**
- #: 2
  - Blades: 5,  $\phi$ : 4.6 m
  - Shaft RPM: 200

LOFARGRAM CRUISE SPEED (Hz)

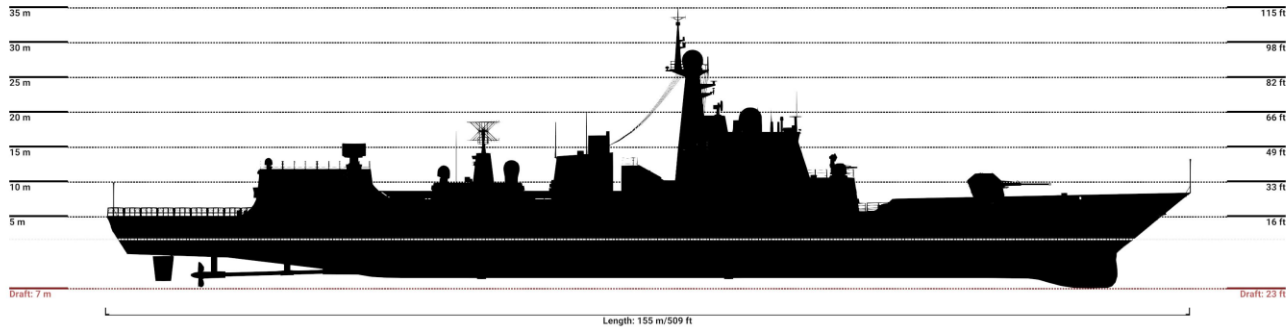


LOFARGRAM HIGH SPEED (Hz)



**A** DDG - Type 052D Luyang III

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

Evolved multi-mission destroyer utilizing a universal VLS system for a mix of anti-air, anti-ship, and land-attack cruise missiles.

**TYPE**

- Guided missile destroyer
- Crew: 280

**DIMENSIONS**

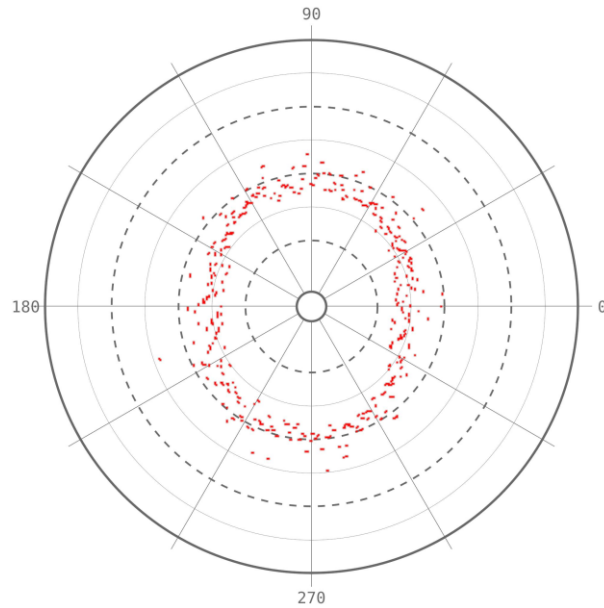
- Length: 155.0 m
- Beam: 17.0 m
- Draft: 6.5 m
- Displacement: 6000.0 tons

**SPEEDS**

- Max: 30.0 kts
- Cruise: 15.0 kts



RADAR RCS



**SENSORS**

- RADAR: Type 346A AESA (rotating fixed panels)
- SONAR: hull sonar + towed array
- VISUAL: -
- EW: Type 726 Modernized EW suite

**ARMAMENT**

- GUNS: 130 mm
- MISSILES: 64x VLS cells (HHQ-9, YJ-18, CJ-10, CY-5)
- TORPEDOES: 2x triple 324 mm
- MORTARS: ASW rockets
- DECOYS: Type 726
- CLOSE IN: HQ-10, Type 730/1130 CIWS
- AIRCRAFT: 2x Z-9 / Z-20

**MACHINERY**

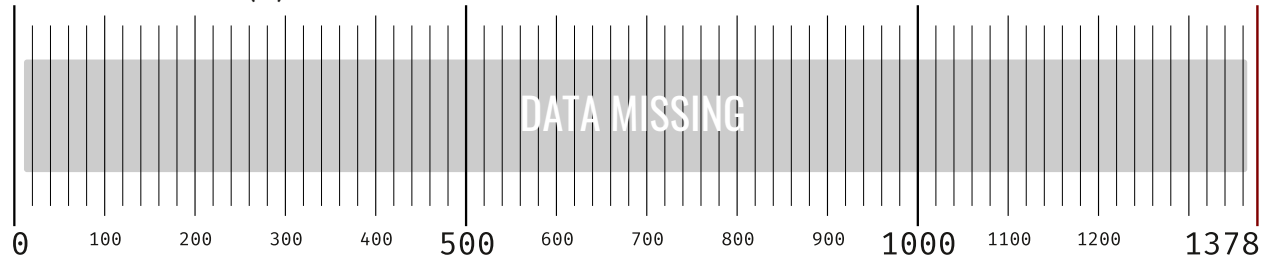
ENGINE(S)

- 2x QC-280 gas turbines, 2x MTU 20V 956TB92
- Cycles: 4, Cylinders: 20V Turbo
- Power: 2x 20 900 kW (28 400 shp), 2x 4 900 kW (6 660 shp)
- CMP: CODOG , Gear ratio: 16:1, 8:1
- Engine RPM: 3820, 1325

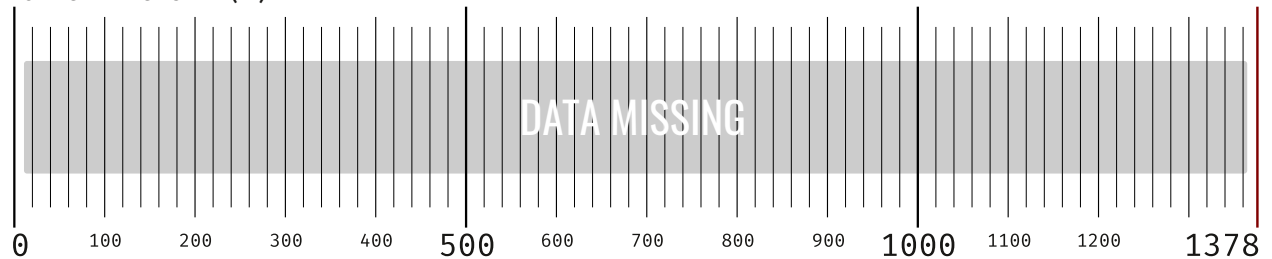
SHAFT(S)

- #: 2
- Blades: 5,  $\phi$ : 3.83 m
- Shaft RPM: 238, 165

LOFARGRAM CRUISE SPEED (Hz)

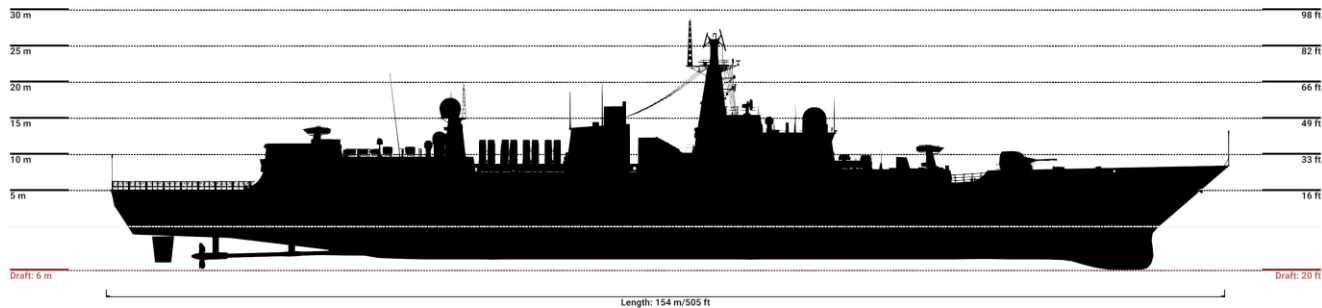


LOFARGRAM HIGH SPEED (Hz)



**A** DDG - Type 052B Luyang I

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

Multi-role destroyer focused on air defense distinctive for its Russian-sourced 3S90 "Shtil" missile launchers and Fregat radar.

**TYPE**

- Guided missile destroyer
- Crew: 280

**DIMENSIONS**

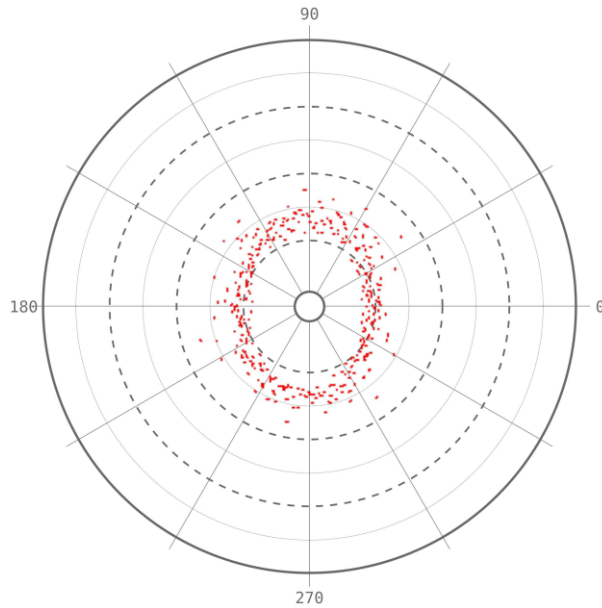
- Length: 154.0 m
- Beam: 17.0 m
- Draft: 6.0 m
- Displacement: 5850.0 tons

**SPEEDS**

- Max: 30.0 kts
- Cruise: 15.0 kts



RADAR RCS



**SENSORS**

- RADAR: Type 346 (early AESA)
- SONAR: hull sonar + variable depth sonar
- VISUAL: -
- EW: Type 726 EW suite

**ARMAMENT**

- GUNS: 100 mm
- MISSILES: 8x YJ-83, SA-N-12
- TORPEDOES: 2x triple 324 mm
- MORTARS: ASW rockets
- DECOYS: Type 726
- CLOSE IN: Type 730 CIWS
- AIRCRAFT: 1-2x Z-9

**MACHINERY**

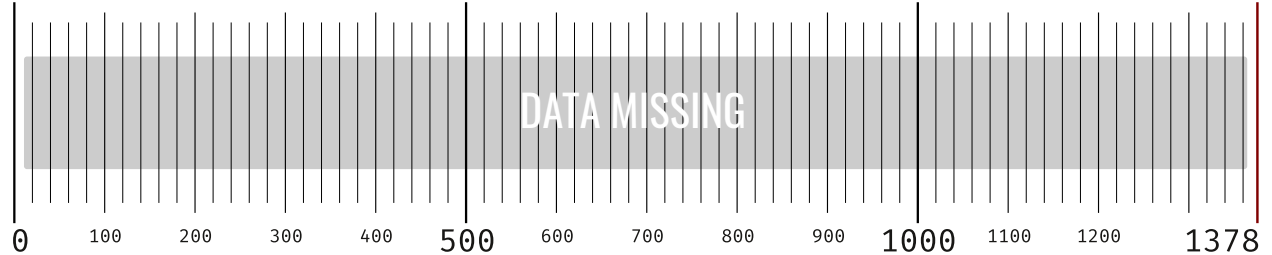
ENGINE(S)

- 2x DA80 gas turbines, 2x MTU 12V 1163 TB83
- Cycles: 4, Cylinders: 12V Turbo
- Power: 2x 17 850 kW (24 300 shp), 2x 3 600 kW (4 890 shp)
- CMP: CODOG , Gear ratio: 13.6:1, 8:1
- Engine RPM: 3270, 1200

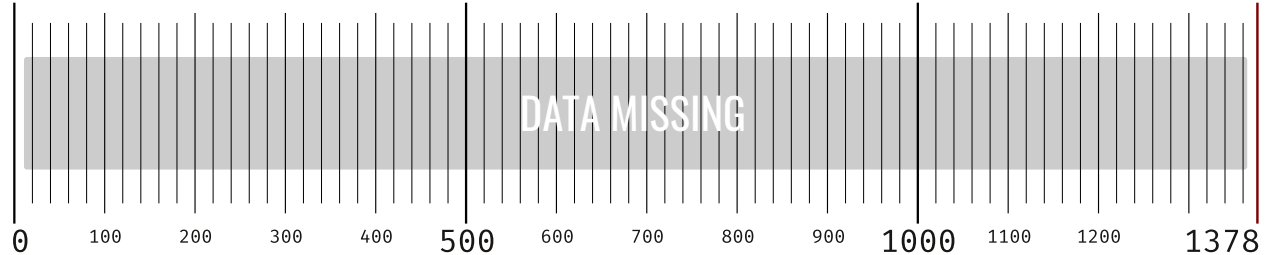
SHAFT(S)

- #: 2
- Blades: 5,  $\phi$ : 3.83 m
- Shaft RPM: 240, 150

LOFARGRAM CRUISE SPEED (Hz)

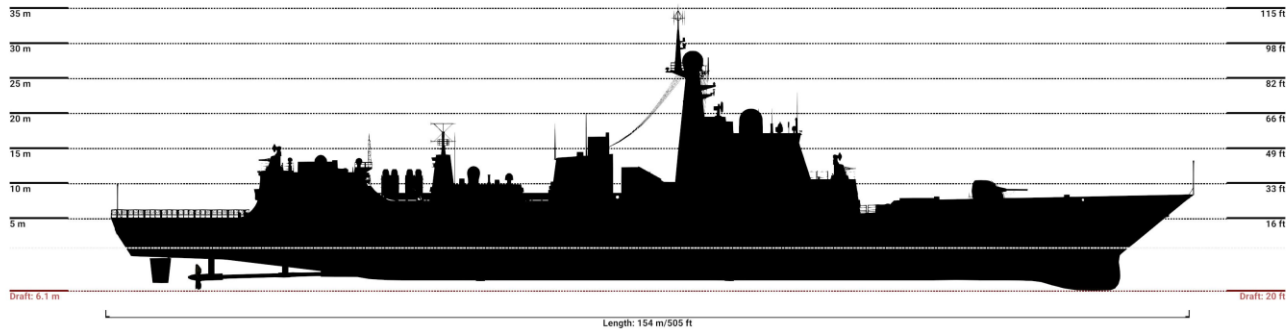


LOFARGRAM HIGH SPEED (Hz)



**A** DDG - Type 052C Luyang II

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

PLAN's first dedicated "Aegis-type" destroyer that features Type 346 active phased array radar and cold-launched HHQ-9 missiles.

**TYPE**

- Guided missile destroyer
- Crew: 280

**DIMENSIONS**

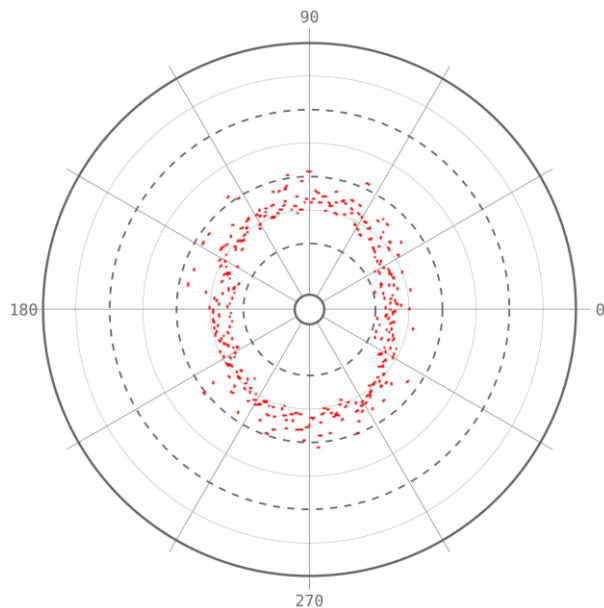
- Length: 154.0 m
- Beam: 17.0 m
- Draft: 6.0 m
- Displacement: 5850.0 tons

**SPEEDS**

- Max: 30.0 kts
- Cruise: 15.0 kts



RADAR RCS



**SENSORS**

- RADAR: Type 346 AESA (3D radar)
- SONAR: hull sonar
- VISUAL: -
- EW: Type 726 EW suite

**ARMAMENT**

- GUNS: 100 mm
- MISSILES: 8x YJ-62, 48x HHQ-9 VLS cells
- TORPEDOES: 2x triple 324 mm
- MORTARS: ASW rockets
- DECOYS: Type 726
- CLOSE IN: Type 730 CIWS
- AIRCRAFT: 1-2x Z-9

**MACHINERY**

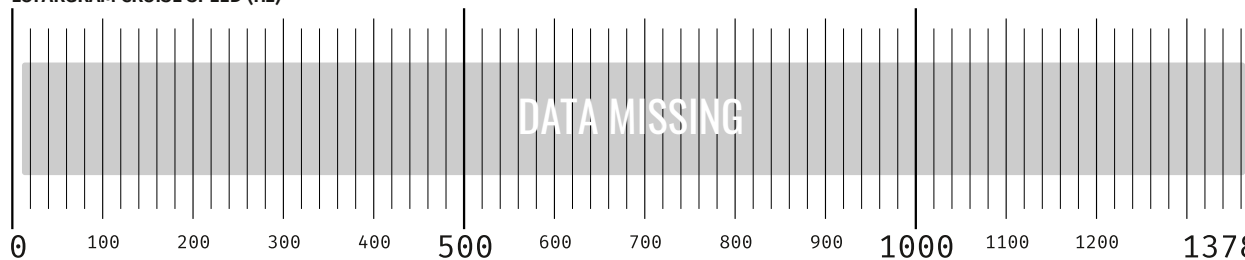
ENGINE(S)

- 2x DA80 gas turbines, 2x MTU 20V 956 TB92
- Cycles: 4, Cylinders: 20V Turbo
- Power: 2x 17 850 kW (24 300 shp), 2x 4 850 kW (6 590 shp)
- CMP: CODOG , Gear ratio: 13.6:1, 8:1
- Engine RPM: 3270, 1400

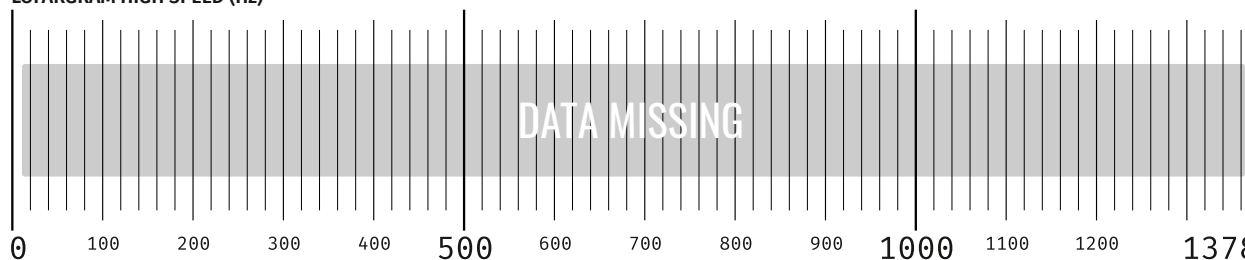
SHAFT(S)

- #: 2
- Blades: 5,  $\phi$ : 3.83 m
- Shaft RPM: 240, 175

LOFARGRAM CRUISE SPEED (Hz)

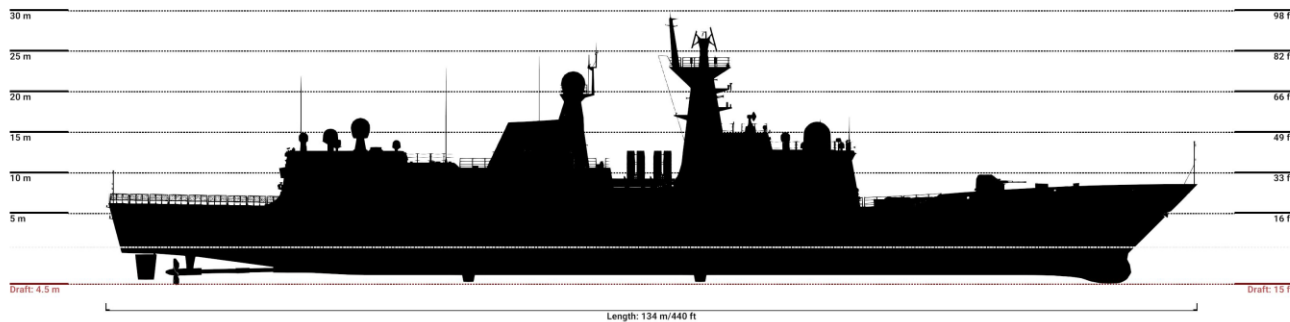


LOFARGRAM HIGH SPEED (Hz)



# A DDG - Type 054A Jiangkai II

## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



### SPECIFICATION

Workhorse multi-role frigate, optimized for ASW and medium-range air defense with a 32-cell VLS and improved sonar suites.

#### TYPE

- Guided missile destroyer
- Crew: 180

#### DIMENSIONS

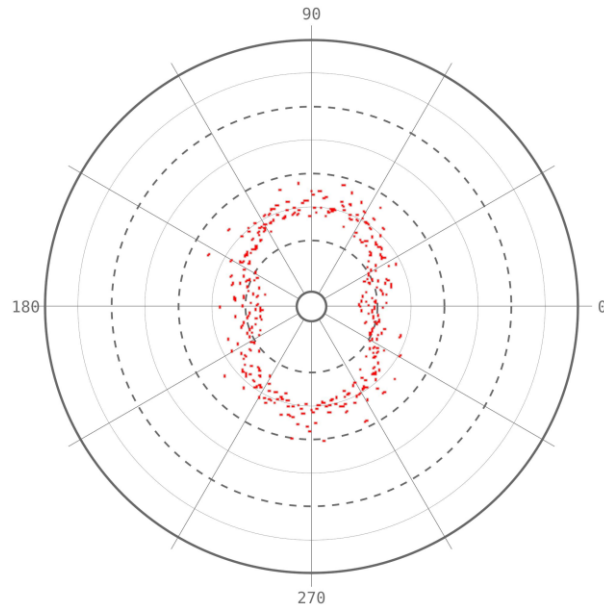
- Length: 134.1 m
- Beam: 16.0 m
- Draft: 4.5 m
- Displacement: 3600.0 tons

#### SPEEDS

- Max: 27.0 kts
- Cruise: 18.0 kts



RADAR RCS



**SENSORS**

- RADAR: Type 382 + Type 366 fire control
- SONAR: hull sonar + towed array
- VISUAL: -
- EW: Type 726 EW suite

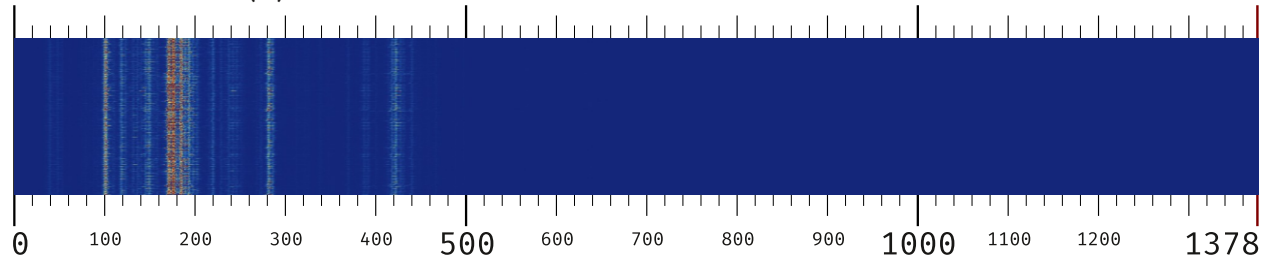
**ARMAMENT**

- GUNS: 76 mm
- MISSILES: 8x YJ-83, 32x HHQ-16 VLS cells
- TORPEDOES: 2x triple 324 mm
- MORTARS: Type 87 ASW rockets
- DECOYS: Type 726-4
- CLOSE IN: Type 730 CIWS
- AIRCRAFT: 1-2x Z-9C

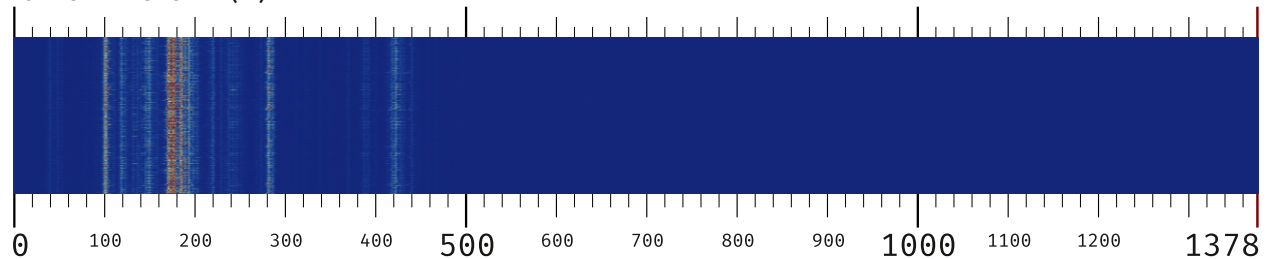
**MACHINERY**

- ENGINE(S)**
- 4x SEMT Peilstick 16 PA 6V 280 STC
  - Cycles: 4, Cylinders: 16V Turbo
  - Power: 4x 5 184 kW (7 050 shp)
  - CMP: CODAD , Gear ratio: 5:1
  - Engine RPM: 1050
- SHAFT(S)**
- #: 2
  - Blades: 5,  $\phi$ : 4.0 m
  - Shaft RPM: 210

LOFARGRAM CRUISE SPEED (Hz)

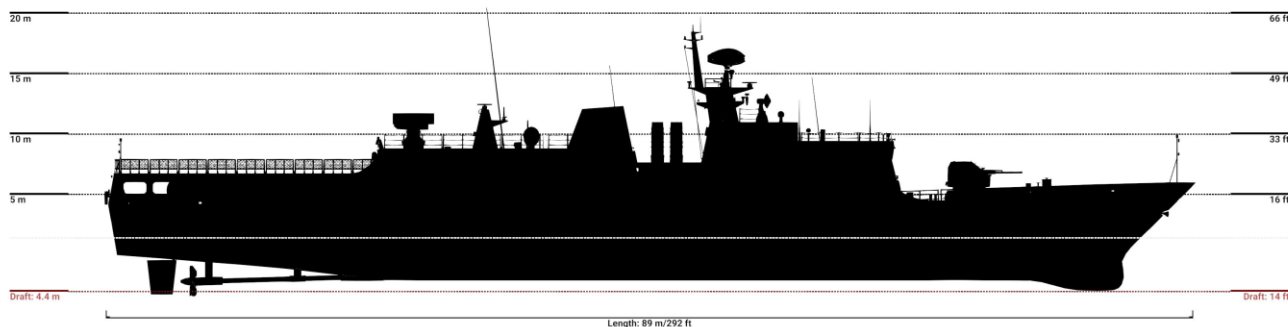


LOFARGRAM HIGH SPEED (Hz)



**A** FS - Type 056A Jiangdao

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

Enhanced corvette variant specialized for ASW. It features an added variable depth sonar (VDS) system.

**TYPE**

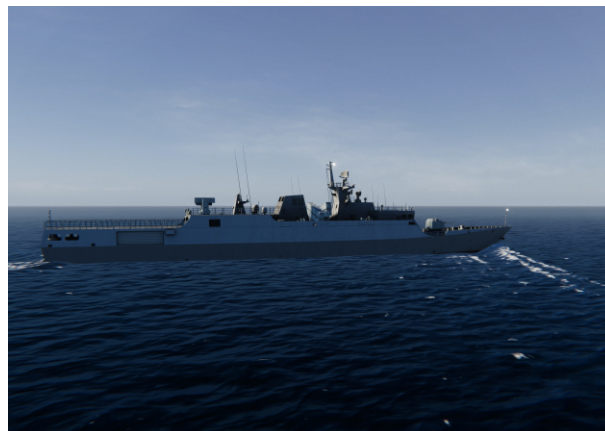
- Corvette
- Crew: 75

**DIMENSIONS**

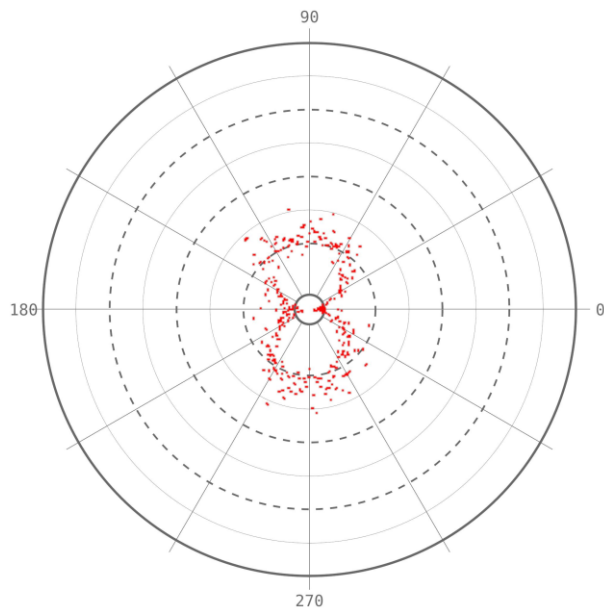
- Length: 89.0 m
- Beam: 11.6 m
- Draft: 4.0 m
- Displacement: 1300.0 tons

**SPEEDS**

- Max: 28.0 kts
- Cruise: 16.0 kts



RADAR RCS



**SENSORS**

- RADAR: Type 362 / Type 347
- SONAR: fire control sonar + towed array
- VISUAL: -
- EW: EW suite

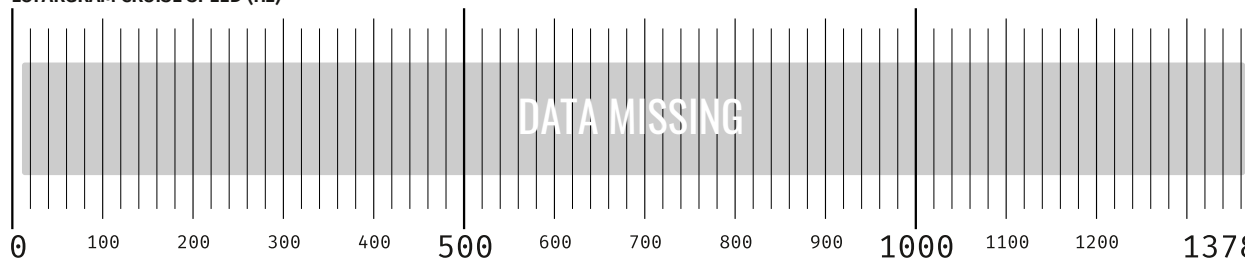
**ARMAMENT**

- GUNS: 76 mm
- MISSILES: 4x YJ-83
- TORPEDOES: 2x triple 324 mm
- MORTARS: ASW rockets (some variants)
- DECOYS: Decoys
- CLOSE IN: HQ-10, 30 mm CIWS
- AIRCRAFT: 1x Z-9

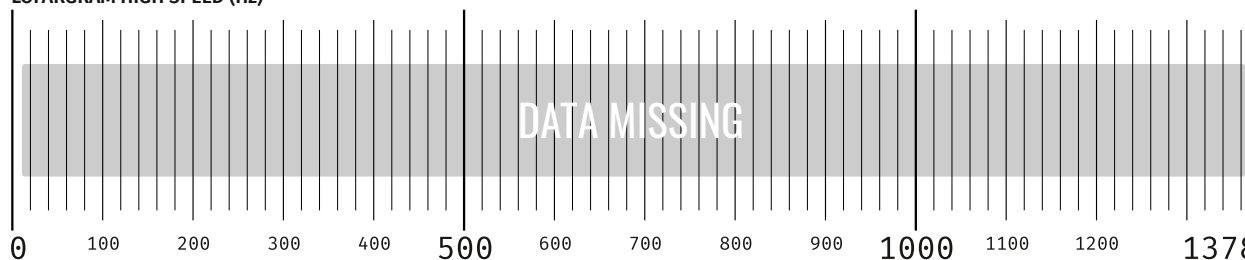
**MACHINERY**

- ENGINE(S)
- 2x SEMT Pielstick PA6-STC
  - Cycles: 4, Cylinders: 16V Turbo
  - Power: 2x 5 184 kW (7 050 shp)
  - CMP: Geared , Gear ratio: 4:1
  - Engine RPM: 1000
- SHAFT(S)
- #: 2
  - Blades: 5,  $\phi$ : 3.0 m
  - Shaft RPM: 250

LOFARGRAM CRUISE SPEED (Hz)

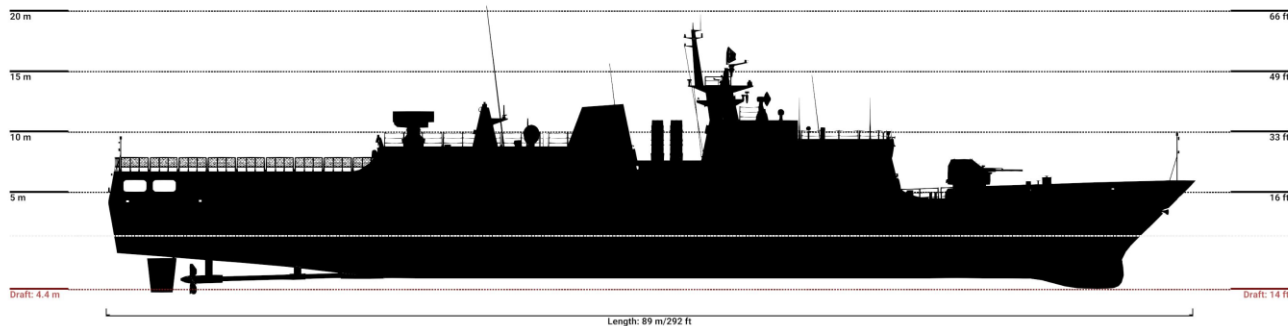


LOFARGRAM HIGH SPEED (Hz)



**A** FS - Type 056 Jiangdao

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

Compact corvette designed for littoral patrol and coastal defense, It is equipped with a 76mm main gun and YJ-83 anti-ship missiles.

**TYPE**

- Corvette
- Crew: 60

**DIMENSIONS**

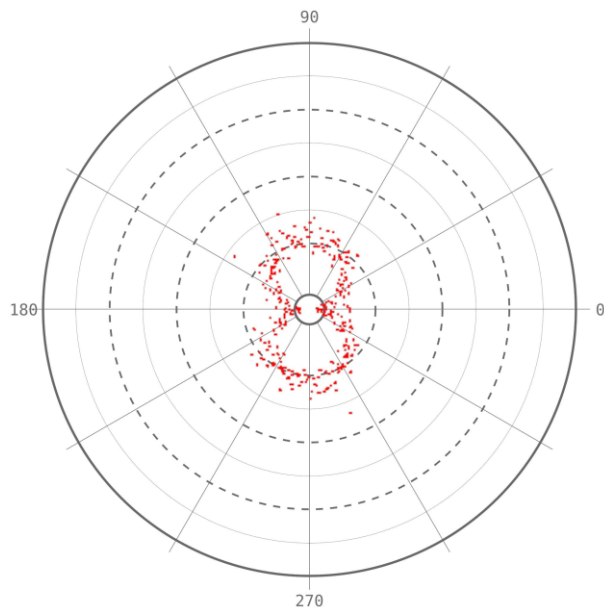
- Length: 89.0 m
- Beam: 11.6 m
- Draft: 4.0 m
- Displacement: 1300.0 tons

**SPEEDS**

- Max: 25.0 kts
- Cruise: 16.0 kts



RADAR RCS



**SENSORS**

- RADAR: Type 347G / Type 362
- SONAR: hull sonar + towed array
- VISUAL: -
- EW: EW suite

**ARMAMENT**

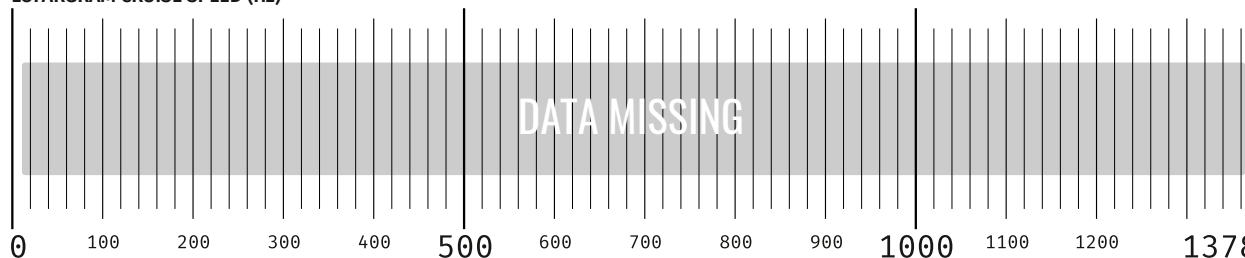
- GUNS: 76 mm
- MISSILES: 4x YJ-83
- TORPEDOES: 2x triple 324 mm
- MORTARS: -
- DECOYS: Decoys
- CLOSE IN: HQ-10, 30 mm CIWS
- AIRCRAFT: 1x Z-9

**MACHINERY**

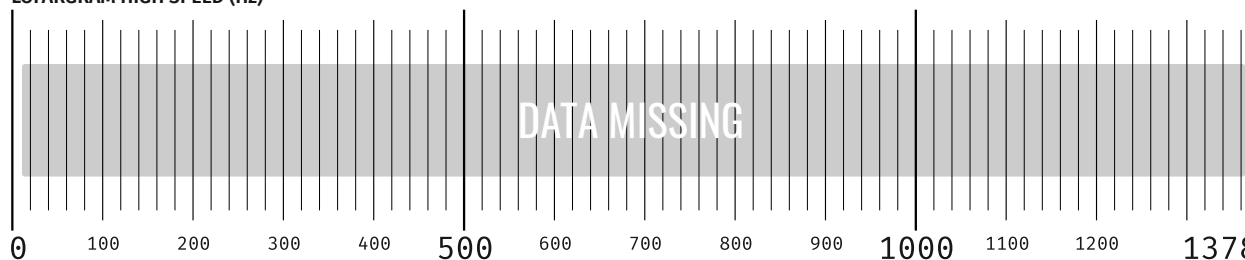
- ENGINE(S)
- 2x SEMT Pielstick PA6-STC
  - Cycles: 4, Cylinders: 16V Turbo
  - Power: 2x 5 184 kW (7 050 shp)
  - CMP: Geared , Gear ratio: 4:1
  - Engine RPM: 1000

- SHAFT(S)
- #: 2
  - Blades: 5,  $\phi$ : 3.0 m
  - Shaft RPM: 250

LOFARGRAM CRUISE SPEED (Hz)

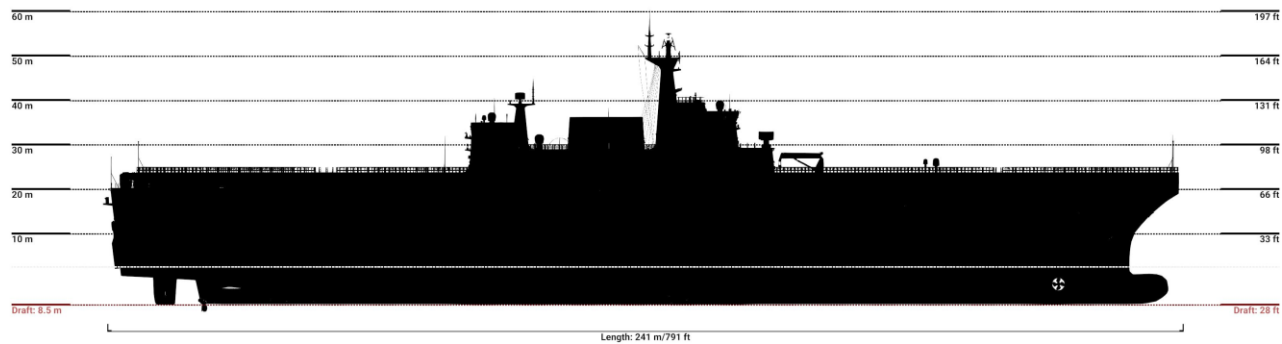


LOFARGRAM HIGH SPEED (Hz)



# A LHD - Type 075 Yushen

## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



### SPECIFICATION

Large-deck amphibious assault ship (LHD) focused on vertical envelopment capable of operating a significant wing of transport and attack helicopters.

#### TYPE

- Amphibious Assault Ship (Multi-Purpose, i.e. added Landing Craft ability versus LHA)
- Crew: 1000

#### DIMENSIONS

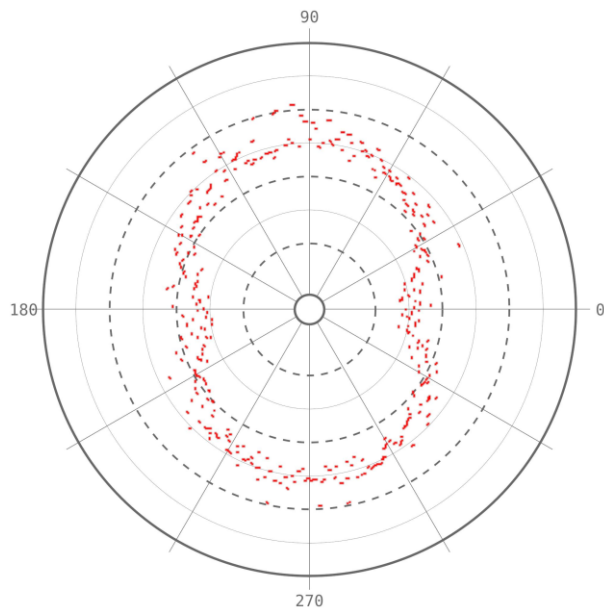
- Length: 241.0 m
- Beam: 36.8 m
- Draft: 8.1 m
- Displacement: 30000.0 tons

#### SPEEDS

- Max: 24.0 kts
- Cruise: 18.0 kts



RADAR RCS



### SENSORS

- RADAR: Type 382 + air search radar
- SONAR: -
- VISUAL: -
- EW: EW suite

### ARMAMENT

- GUNS: 30 mm H/PJ-11
- MISSILES: -
- TORPEDOES: -
- MORTARS: -
- DECOYS: Decoy systems
- CLOSE IN: HQ-10, H/PJ-11 CIWS
- AIRCRAFT: 20-30x helicopters (Z-8 / Z-20 / Z-9)

### MACHINERY

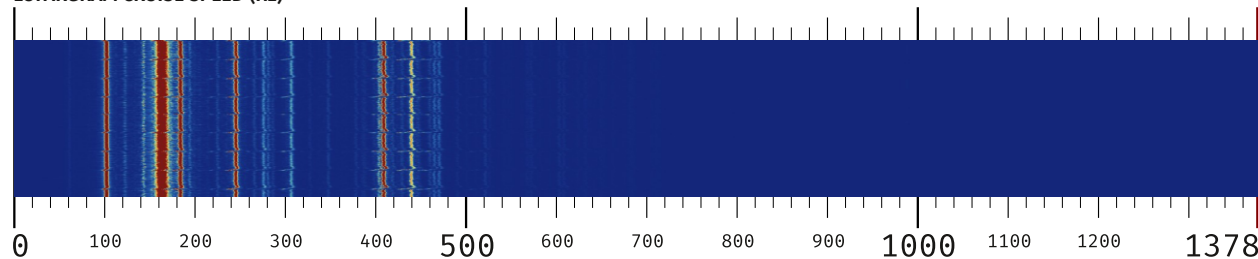
#### ENGINE(S)

- 4x SEMT Pielstick 16PC2-6B
- Cycles: 4, Cylinders: 16V Turbo
- Power: 4x 8 800 kW (12 000 shp)
- CMP: CODAD, Gear ratio: 4:1
- Engine RPM: 500

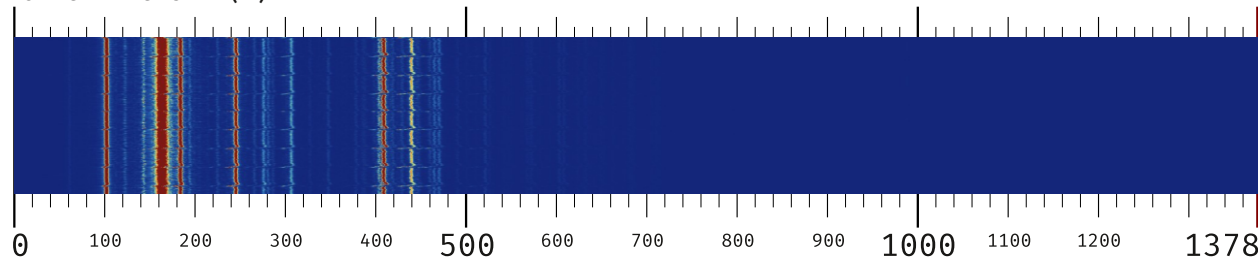
#### SHAFT(S)

- #: 2
- Blades: 5,  $\phi$ : 5 m
- Shaft RPM: 125

LOFARGRAM CRUISE SPEED (Hz)

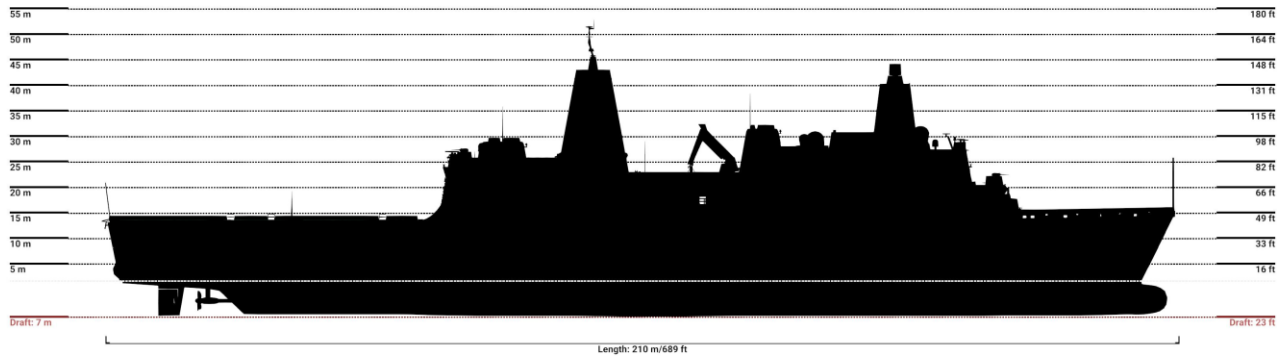


LOFARGRAM HIGH SPEED (Hz)



**A** LPD - San Antonio

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

Amphibious transport dock designed for "stealth" with a reduced radar cross-section hull, advanced command-and-control suites and modern defenses.

**TYPE**

- Amphibious Transport, Dock (aka Landing Platform, Dock)
- Crew: 360

**DIMENSIONS**

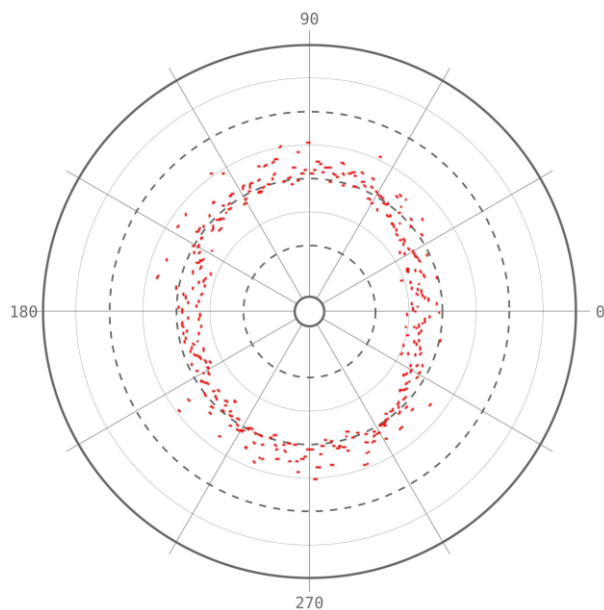
- Length: 210.0 m
- Beam: 31.9 m
- Draft: 7.0 m
- Displacement: 24000.0 tons

**SPEEDS**

- Max: 22.0 kts
- Cruise: 19.0 kts



RADAR RCS



**SENSORS**

- RADAR: AN/SPS-48E + SPS-73
- SONAR: Variable depth sonar (limited)
- VISUAL: -
- EW: SLQ-32 EW suite

**ARMAMENT**

- GUNS: 30 mm Mk 46, 25 mm Mk 38
- MISSILES: -
- TORPEDOES: -
- MORTARS: -
- DECOYS: Mk 36 SRBOC, SLQ-25 Nixie
- CLOSE IN: RAM
- AIRCRAFT: 4x MV-22 / CH-53 / MH-60 mix

**MACHINERY**

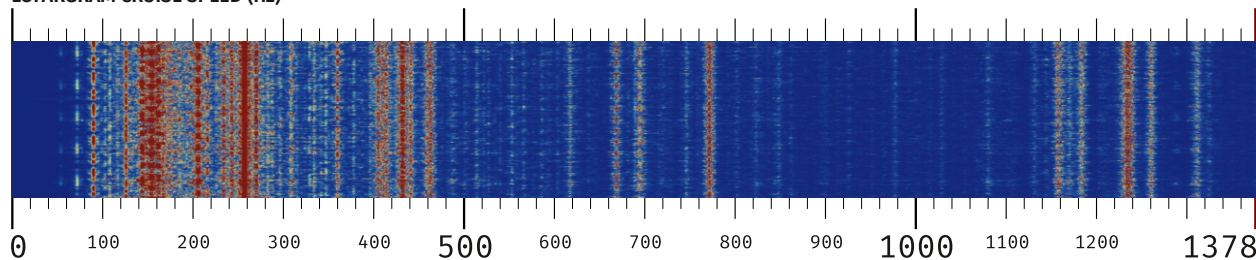
ENGINE(S)

- 4x sequentially turbocharged marine Colt-Pielstick PC2.5
- Cycles: 4, Cylinders: 16V
- Power: 4x 7 755 kW (10 500 shp)
- CMP: Geared, Gear ratio: 2.6:1
- Engine RPM: 520

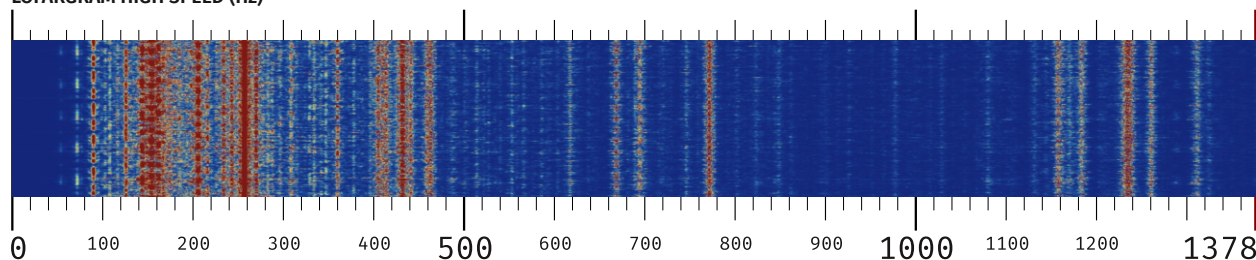
SHAFT(S)

- #: 2
- Blades: 5,  $\phi$ : 4 m
- Shaft RPM: 200

LOFARGRAM CRUISE SPEED (Hz)

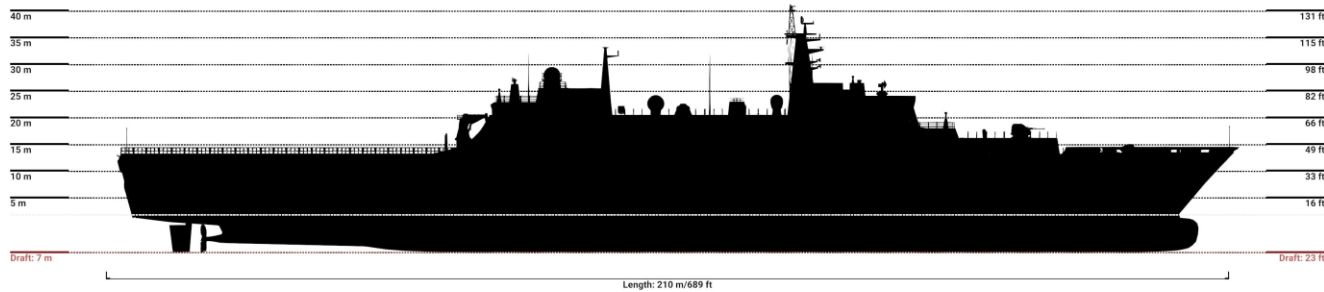


LOFARGRAM HIGH SPEED (Hz)



**A** LPD - Type 071 Yuzhao

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

Amphibious transport dock capable of deploying hovercraft, helicopters, and amphibious armored vehicles via a large well deck.

**TYPE**

- Amphibious Transport, Dock (aka Landing Platform, Dock)
- Crew: 175

**DIMENSIONS**

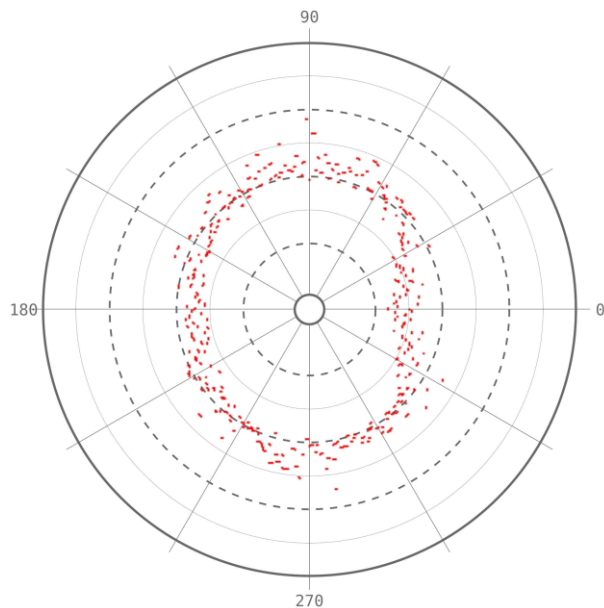
- Length: 210.0 m
- Beam: 28.0 m
- Draft: 7.0 m
- Displacement: 20000.0 tons

**SPEEDS**

- Max: 25.0 kts
- Cruise: 18.0 kts



RADAR RCS



**SENSORS**

- RADAR: Type 360 search radar
- SONAR: hull sonar (limited)
- VISUAL: -
- EW: EW suite

**ARMAMENT**

- GUNS: 76 mm
- MISSILES: -
- TORPEDOES: -
- MORTARS: -
- DECOYS: Decoy systems
- CLOSE IN: HQ-10, AK-630
- AIRCRAFT: 4-6x Z-8 / Z-18 / Z-9 mix

**MACHINERY**

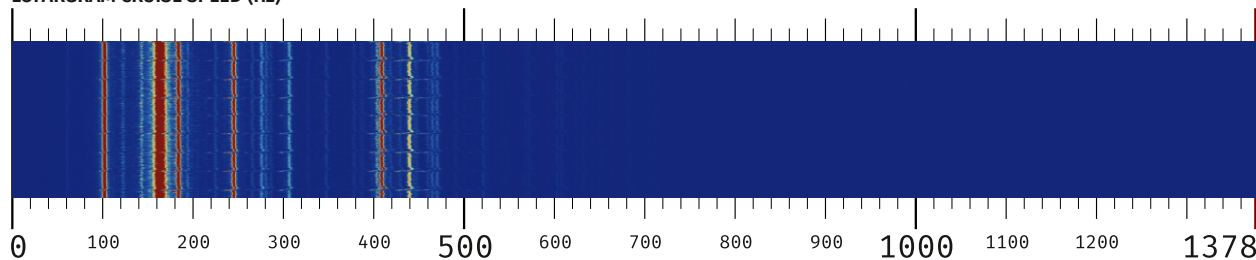
ENGINE(S)

- 4x SEMT Pielstick 16PC2.6V 400
- Cycles: 4, Cylinders: 16V Turbo
- Power: 4x 8 800 kW (12 000 shp)
- CMP: CODAD, Gear ratio: 4:1
- Engine RPM: 500

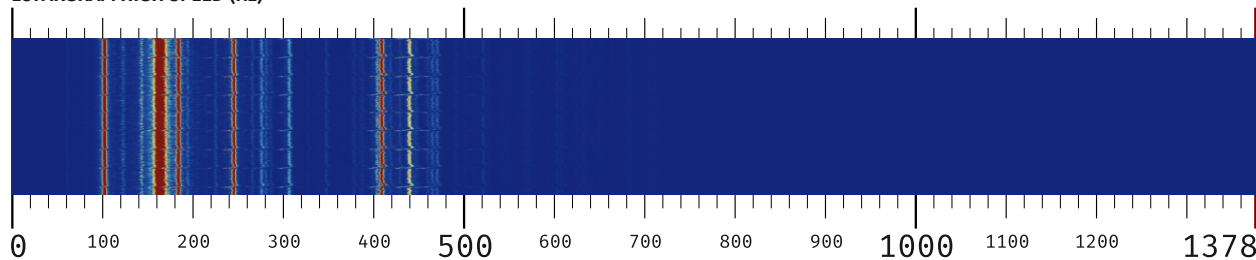
SHAFT(S)

- #: 2
- Blades: 5,  $\phi$ : 5.0 m
- Shaft RPM: 125

LOFARGRAM CRUISE SPEED (Hz)

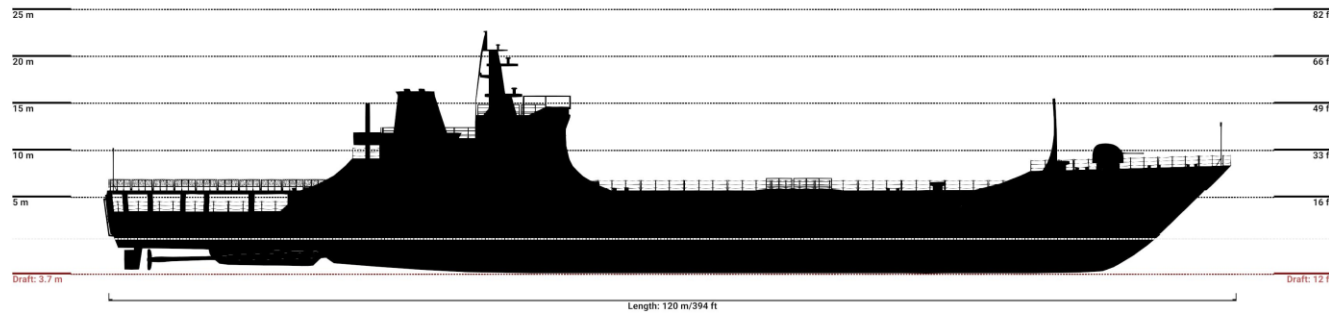


LOFARGRAM HIGH SPEED (Hz)



**A** LST - Type 072A Yuting II

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

Tank landing ship designed for beaching operations. It features a bow ramp and a large deck for transporting vehicles and troops.

**TYPE**

- Landing Ship, Tank
- Crew: 120

**DIMENSIONS**

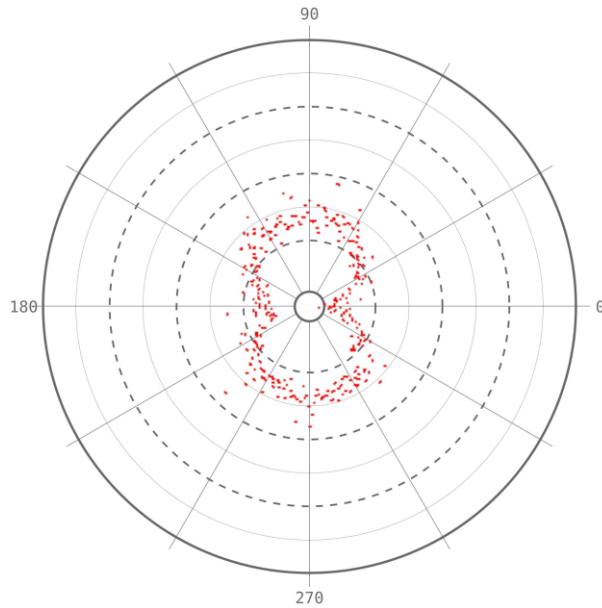
- Length: 120.0 m
- Beam: 16.4 m
- Draft: 3.2 m
- Displacement: 3770.0 tons

**SPEEDS**

- Max: 17.0 kts
- Cruise: 14.0 kts



RADAR RCS



**SENSORS**

- RADAR: Type 352 surface search sonar
- SONAR: -
- VISUAL: -
- EW: Basic EW

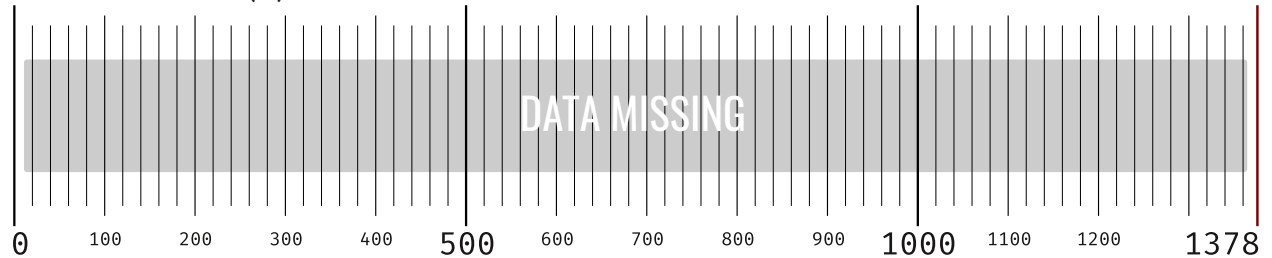
**ARMAMENT**

- GUNS: 76 mm, 30 mm
- MISSILES: -
- TORPEDOES: -
- MORTARS: -
- DECOYS: Decoys
- CLOSE IN: MANPADS
- AIRCRAFT: -

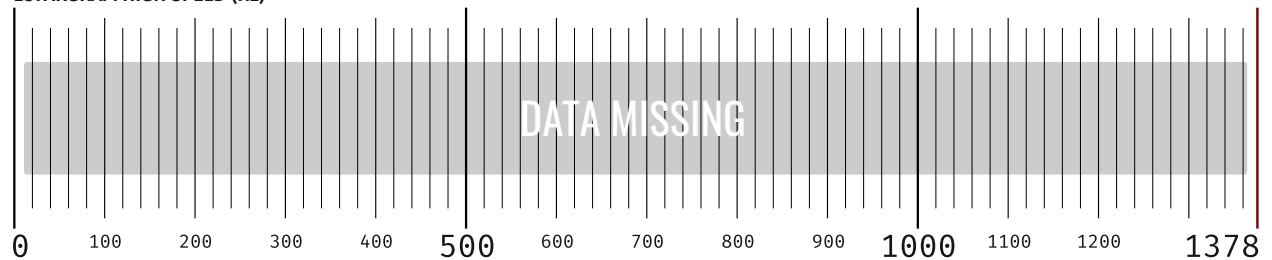
**MACHINERY**

- ENGINE(S)
- 2x 12PA6V-280MPC
  - Cycles: 4, Cylinders: 12V Turbo
  - Power: 2x 3 540 kW (4 810 shp)
  - CMP: Geared , Gear ratio: 5:1
  - Engine RPM: 1000
- SHAFT(S)
- #: 2
  - Blades: 4,  $\phi$ : 2.4 m
  - Shaft RPM: 200

LOFARGRAM CRUISE SPEED (Hz)

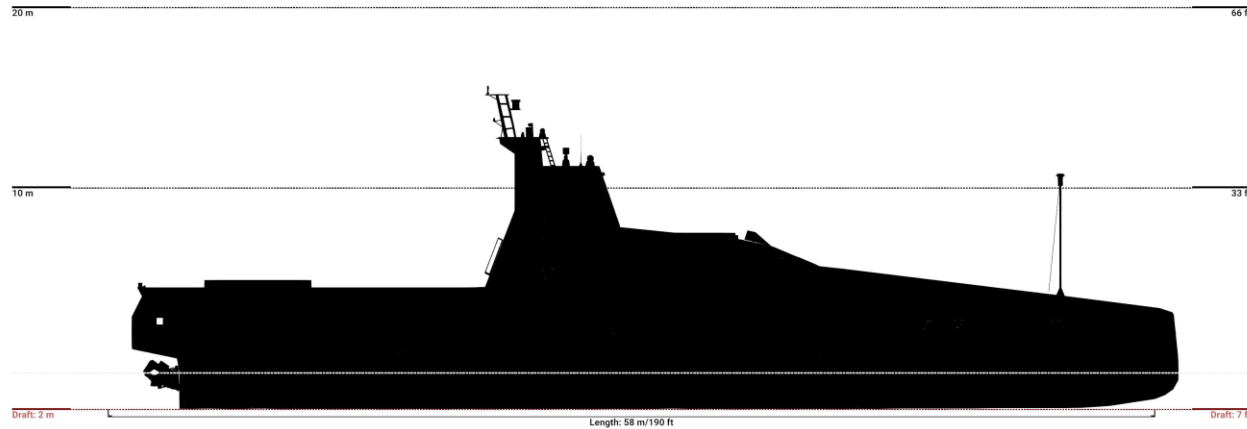


LOFARGRAM HIGH SPEED (Hz)



**A** LUSV - Jari A

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

Unmanned surface vessel acting as a "mini-destroyer". It features a phased-array radar, 533mm torpedoes, and a small VLS for SAMs.

**TYPE**

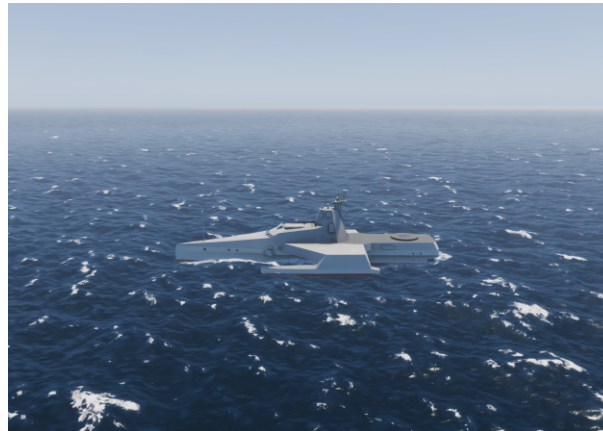
- Large Unmanned Surface Vehicle
- Crew: 0

**DIMENSIONS**

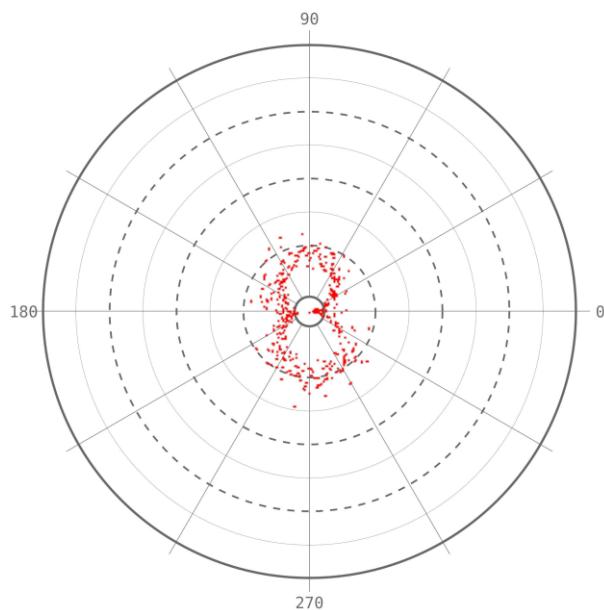
- Length: 60.0 m
- Beam: 23.0 m
- Draft: 2.0 m
- Displacement: 420.0 tons

**SPEEDS**

- Max: 40.0 kts
- Cruise: 25.0 kts



RADAR RCS



**SENSORS**

- RADAR: Surface AESA + navigation radar
- SONAR: Optional modular sonar payload
- VISUAL: Mast EO/IR + cameras
- EW: Modular EW/ESM suite

**ARMAMENT**

- GUNS: 30 mm remote weapon station
- MISSILES: 8x modular VLS cells (SAM or ASuW)
- TORPEDOES: 2x lightweight torpedo tubes (optional)
- MORTARS: -
- DECOYS: Electronic EW/decoys
- CLOSE IN: -
- AIRCRAFT: 1x Light Drone

**MACHINERY**

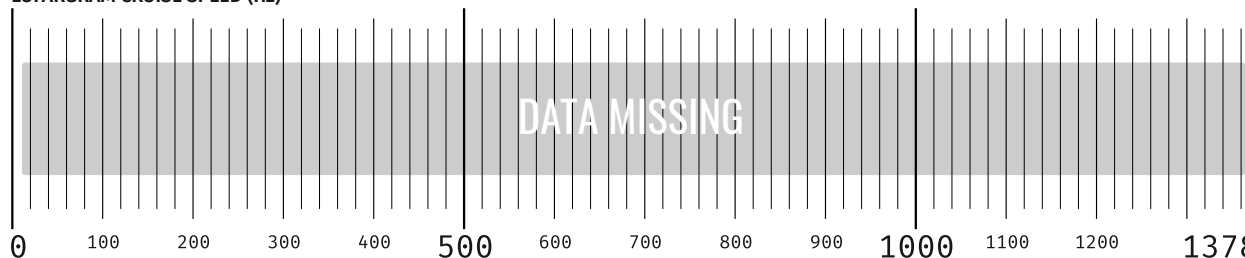
ENGINE(S)

- Cycles: , Cylinders:
- Power:
- CMP: , Gear ratio:
- Engine RPM:

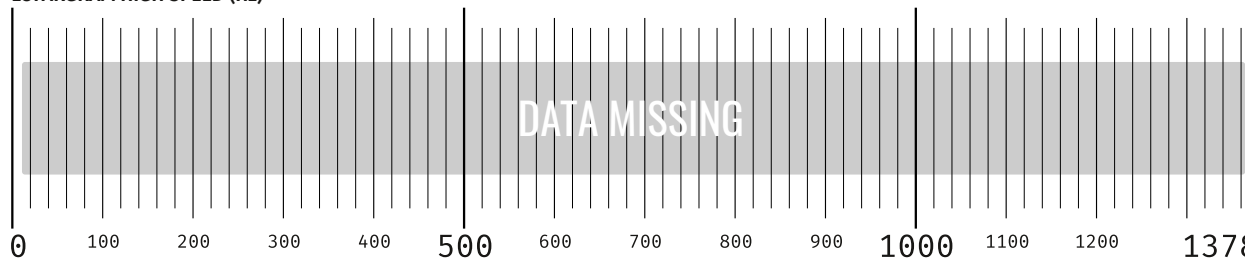
SHAFT(S)

- #: 2
- Blades: ,  $\phi$ : m
- Shaft RPM:

LOFARGRAM CRUISE SPEED (Hz)

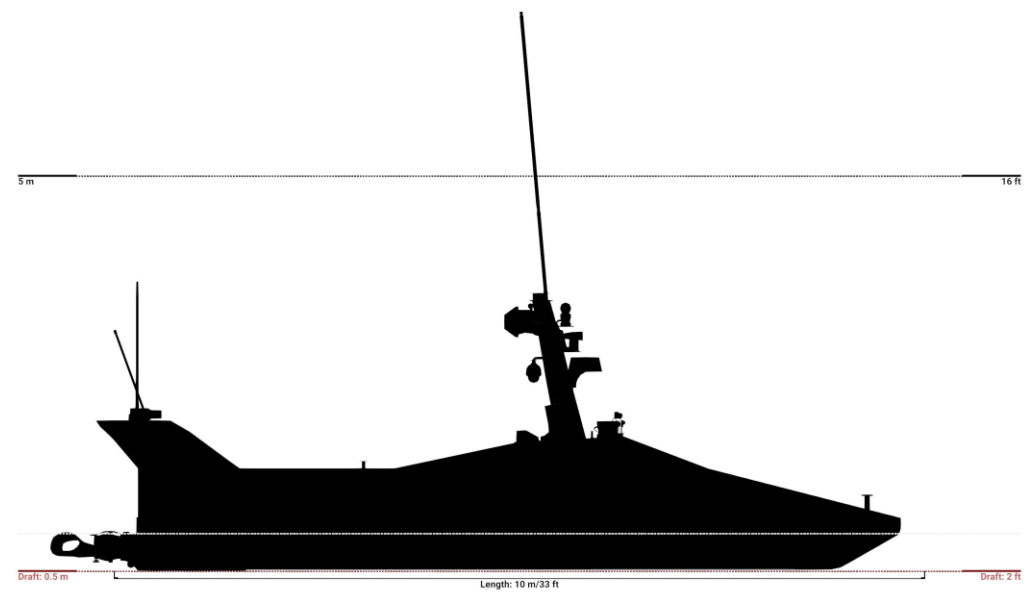


LOFARGRAM HIGH SPEED (Hz)



**A** MUSV - SeaFly

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

High-speed autonomous USV utilized for coastal reconnaissance, electronic warfare, and target drone simulation.

**TYPE**

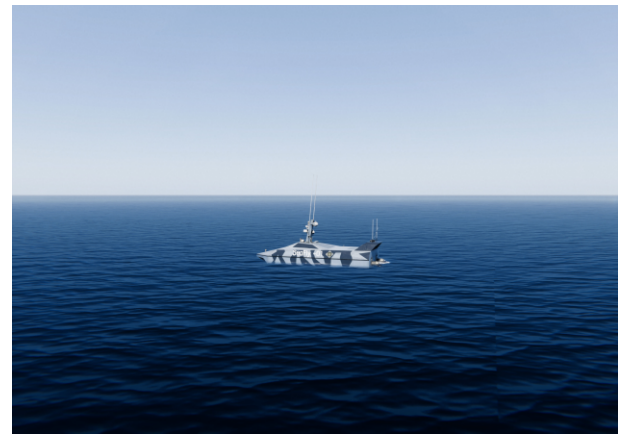
- Medium Unmanned Surface Vehicle
- Crew: 0

**DIMENSIONS**

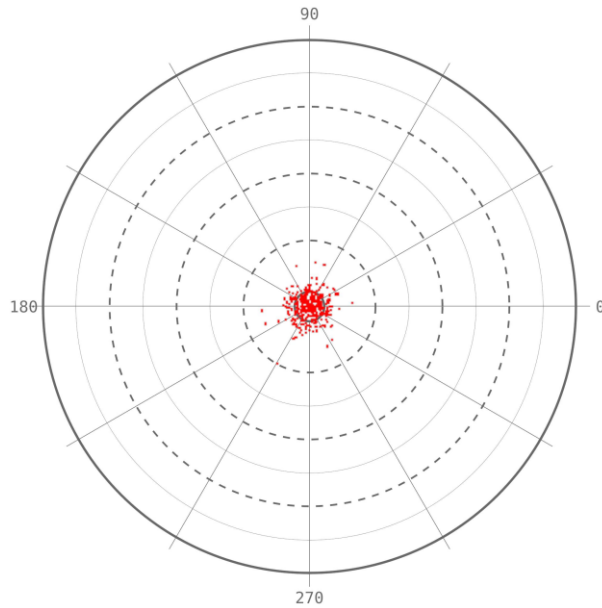
- Length: 10.2 m
- Beam: 3.7 m
- Draft: 0.5 m
- Displacement: 4.5 tons

**SPEEDS**

- Max: 45.0 kts
- Cruise: 30.0 kts



RADAR RCS



**SENSORS**

- RADAR: Light surface radar (navigation/ISR)
- SONAR: -
- VISUAL: EO/IR stabilized camera system
- EW: Soft EW / decoys

**ARMAMENT**

- GUNS: -
- MISSILES: Modular light ASuW payload
- TORPEDOES: -
- MORTARS: -
- DECOYS: Electronic decoys / EW
- CLOSE IN: -
- AIRCRAFT: -

**MACHINERY**

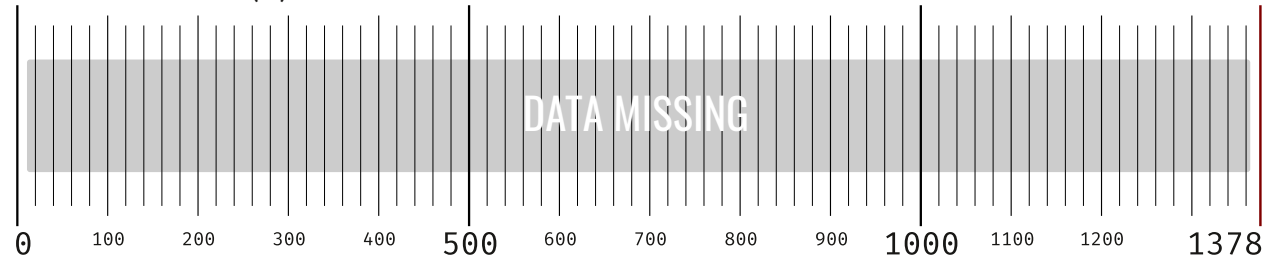
ENGINE(S)

- Cycles: , Cylinders:
- Power:
- CMP: , Gear ratio:
- Engine RPM:

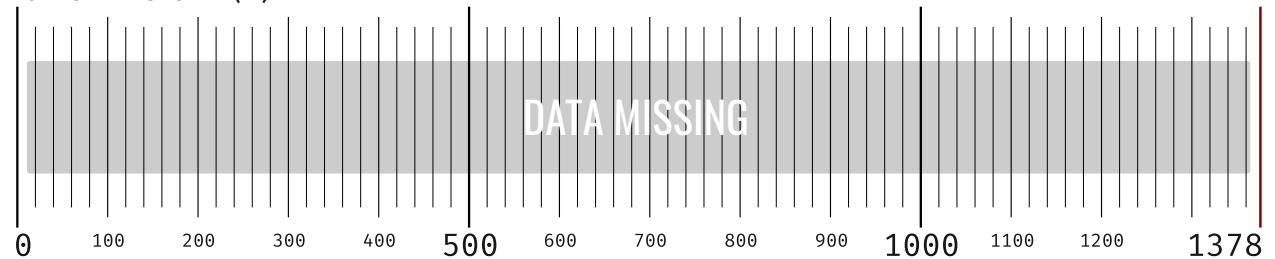
SHAFT(S)

- #: 2
- Blades: ,  $\phi$ : m
- Shaft RPM:

LOFARGRAM CRUISE SPEED (Hz)

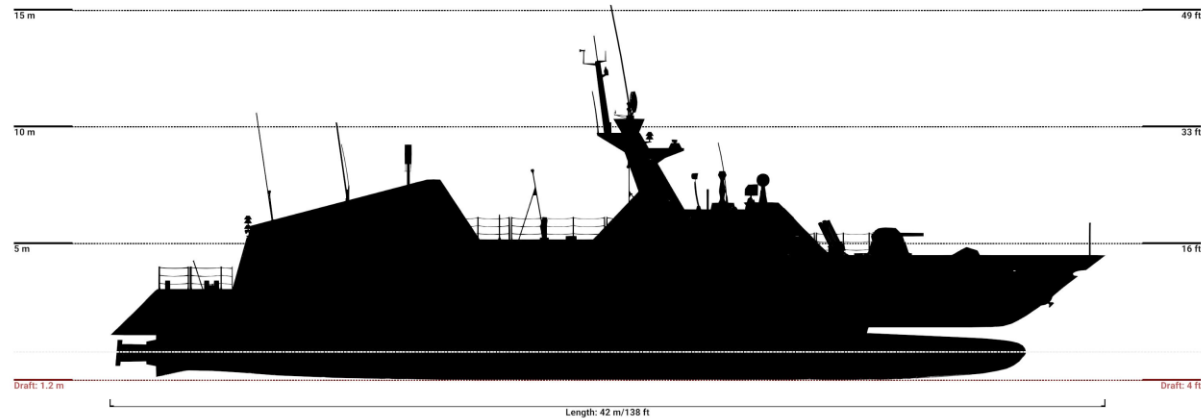


LOFARGRAM HIGH SPEED (Hz)



**A** PB - Type 022 Houbei

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

Wave-piercing stealth catamaran missile boat designed for high-speed littoral "hit-and-run" strikes. It carries eight YJ-83 anti-ship missiles.

**TYPE**

- Patrol boat
- Crew: 12

**DIMENSIONS**

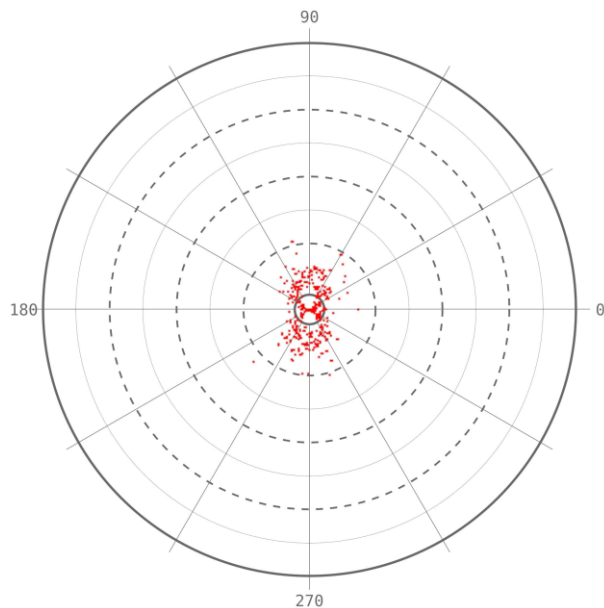
- Length: 42.6 m
- Beam: 12.2 m
- Draft: 1.5 m
- Displacement: 200.0 tons

**SPEEDS**

- Max: 38.0 kts
- Cruise: 15.0 kts



RADAR RCS



**SENSORS**

- RADAR: Type 362 surface search radar
- SONAR: -
- VISUAL: -
- EW: Basic EW/decoys

**ARMAMENT**

- GUNS: 30 mm
- MISSILES: 8x YJ-83
- TORPEDOES: -
- MORTARS: -
- DECOYS: Decoy systems
- CLOSE IN: -
- AIRCRAFT: -

**MACHINERY**

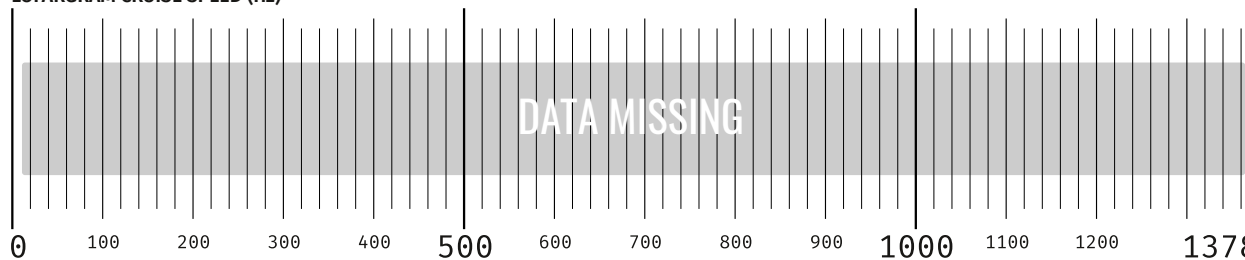
ENGINE(S)

- Cycles: , Cylinders:
- Power:
- CMP: , Gear ratio:
- Engine RPM:

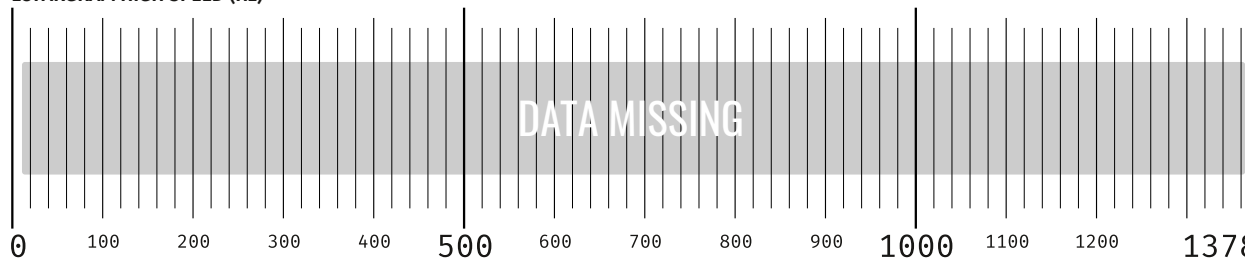
SHAFT(S)

- #: 4
- Blades: , Ø: m
- Shaft RPM:

LOFARGRAM CRUISE SPEED (Hz)



LOFARGRAM HIGH SPEED (Hz)



## 2. SUBMARINES

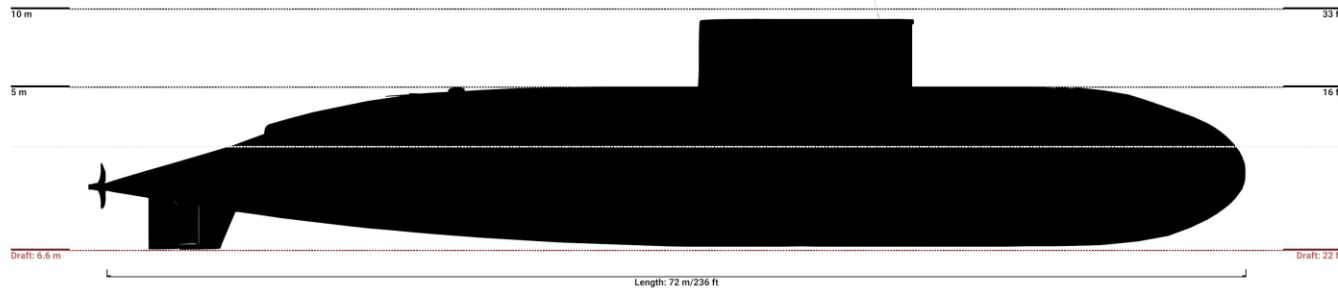


**THIS PAGE INTENTIONALLY LEFT BLANK**



# A SSK - Project 636.3 Varshavyanka (Improved Kilo)

## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



### SPECIFICATION

Advanced "Improved Kilo" with extended range, upgraded electronics, and the ability to launch Kalibr-PL cruise missiles.

#### TYPE

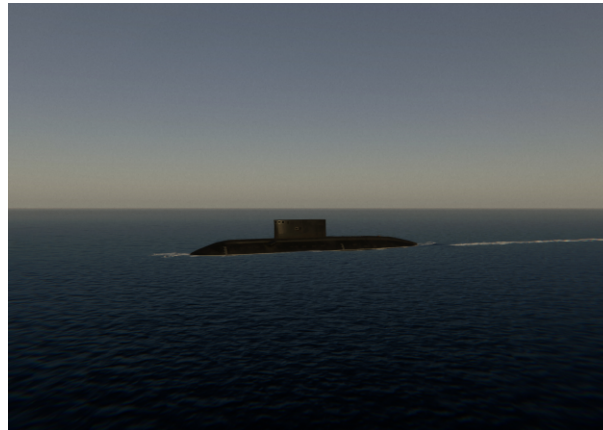
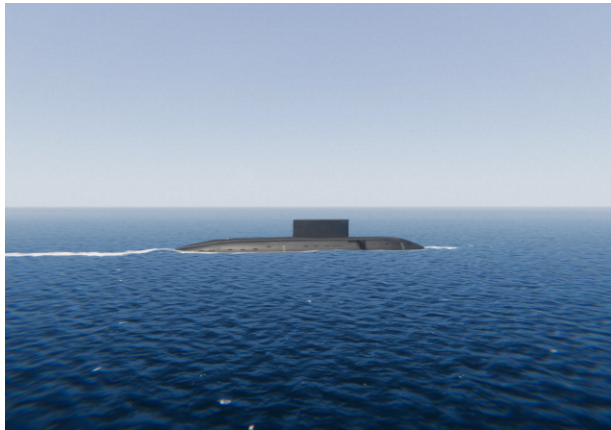
- Hunter-Killer/ASW Submarine
- Crew: 52

#### DIMENSIONS

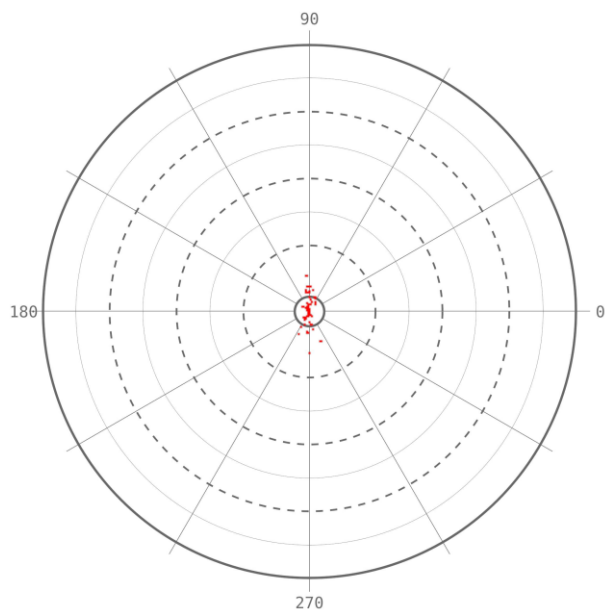
- Length: 73.8 m
- Beam: 9.9 m
- Draft: 6.6 m
- Displacement surfaced: 2362.0 tons
- Displacement dived: 3125.0 tons

#### PERFORMANCE

- Max speed: 20.0 kts
- Max depth: 300.0 m



RADAR RCS



**SENSORS**

- SONAR: MGK-400EKM, cylindrical bow array, high frequency on sail, active intercept
- VISUAL: Parus-98E attack periscope and search optronic
- EW: MRP-25 ESM, radio DF
- RADAR: MRK-50 surface search

**ARMAMENT**

- TORPEDO TUBES: 6x 21 in (533 mm)
- TUBE LAUNCHED WEAPONS: UGST-M HWT, 3M-14K LAM, 3M-54K ASM, MDM-1 Bottom Mine
- VLS TUBES: -
- VLS LAUNCHED WEAPONS: -
- LAUNCHERS: -
- DECOYS: -

**MACHINERY**

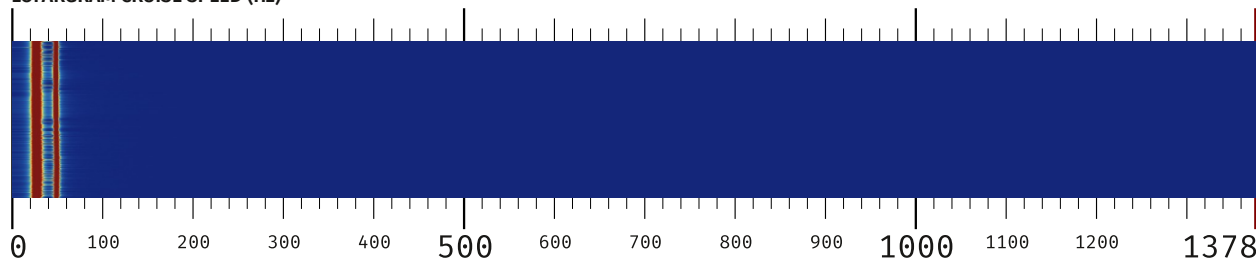
PROPULSION

- Electric motor, 2x diesel generators
- Power: 5 400 kW (7 400 shp)
- CMP: Diesel-electric geared, Gear ratio: 2:1
- Engine RPM: 500

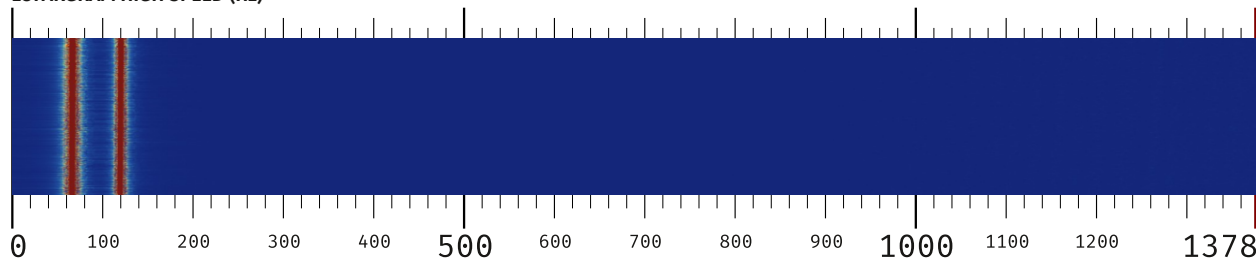
SHAFT(S)

- #: 1
- Type: Skewed
- Blades: 7
- Shaft RPM: 250

LOFARGRAM CRUISE SPEED (Hz)

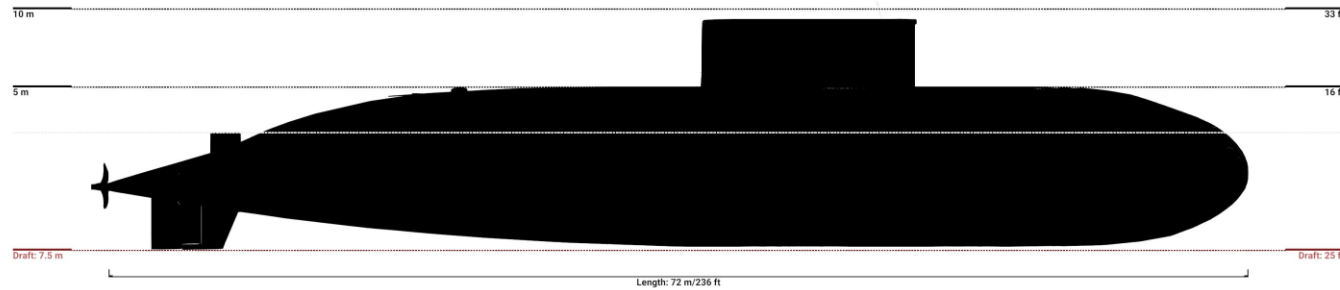


LOFARGRAM HIGH SPEED (Hz)



# A SSK - Project 877 Paltus (Kilo)

## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



### SPECIFICATION

Rugged diesel-electric submarine. The Kilos are widely exported and known for an extremely low acoustic signature when running on batteries.

#### TYPE

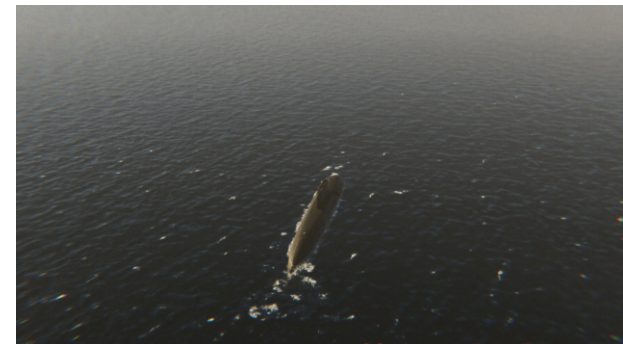
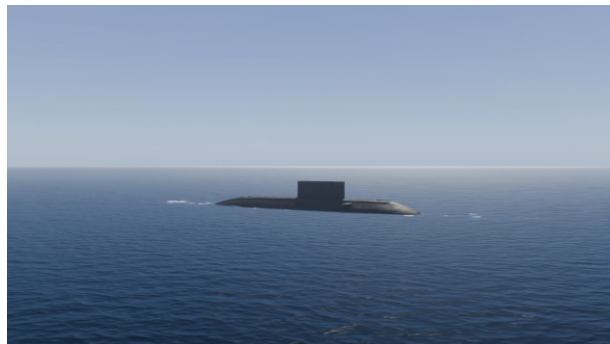
- Hunter-Killer/ASW Submarine
- Crew: 52

#### DIMENSIONS

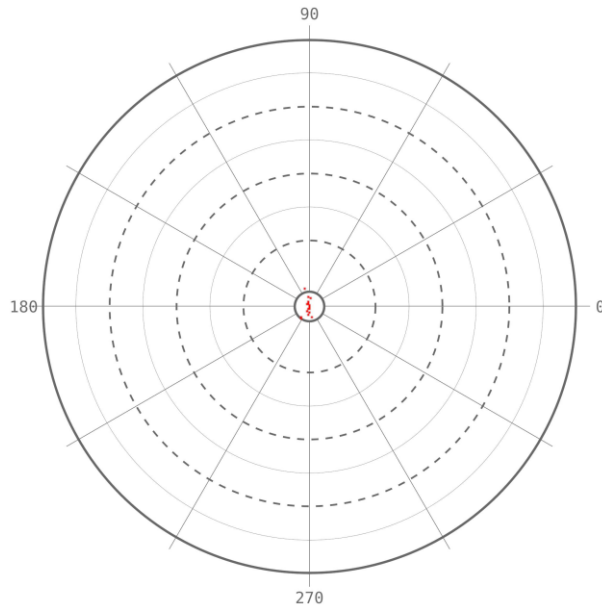
- Length: 72.6 m
- Beam: 9.9 m
- Draft: 6.6 m
- Displacement surfaced: 2362.0 tons
- Displacement dived: 3125.0 tons

#### PERFORMANCE

- Max speed: 20.0 kts
- Max depth: 250.0 m



RADAR RCS



**SENSORS**

- SONAR: MGK-400, cylindrical bow array, high frequency on sail, active intercept
- VISUAL: PZNG-8 attack periscope, PZKE search periscope
- EW: MRP-25 ESM, radio DF
- RADAR: MRP-25 surface search

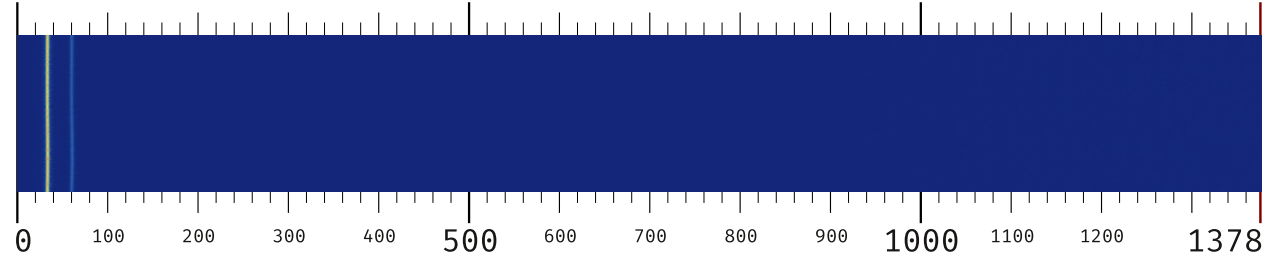
**ARMAMENT**

- TORPEDO TUBES: 6x 21 in (533 mm)
- TUBE LAUNCHED WEAPONS: UGST-M HWT, 3M-14K LAM, 3M-54K ASM, MDM-1 Bottom Mine
- VLS TUBES: -
- VLS LAUNCHED WEAPONS: -
- LAUNCHERS: -
- DECOYS: -

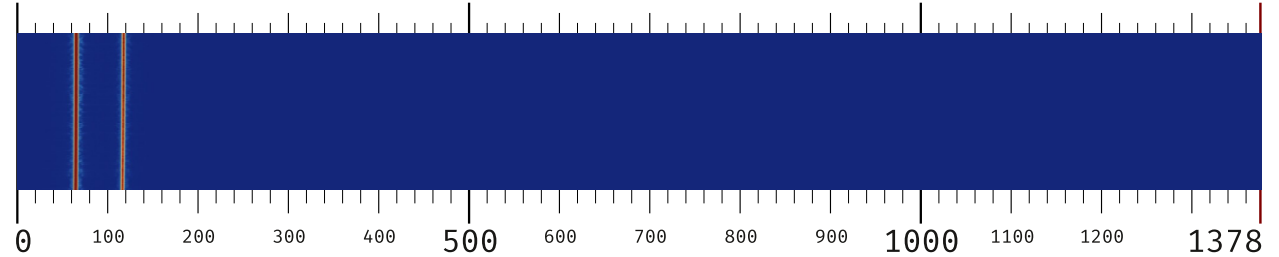
**MACHINERY**

- PROPULSION**
- Electric motor, 2x diesel generators
  - Power: 4 100 kW (5 500 shp)
  - CMP: Diesel-electric, Gear ratio: 1:1
  - Engine RPM: 500
- SHAFT(S)**
- #: 1
  - Type: Skewed
  - Blades: 7
  - Shaft RPM: 500

LOFARGRAM CRUISE SPEED (Hz)

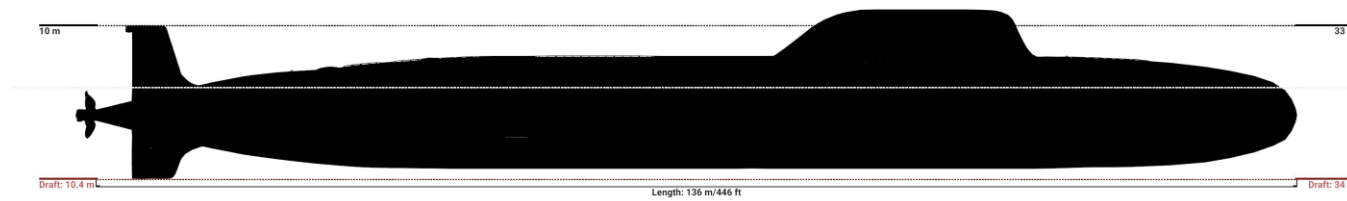


LOFARGRAM HIGH SPEED (Hz)



**A** SSN - Project 885 Yasen (Severodvinsk)

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

Fourth-generation SSGN with a spherical bow sonar and eight VLS silos. It is considered a highly versatile multi-role combatant.

**TYPE**

- Attack Submarine (Nuclear-Powered)
- Crew: 85

**DIMENSIONS**

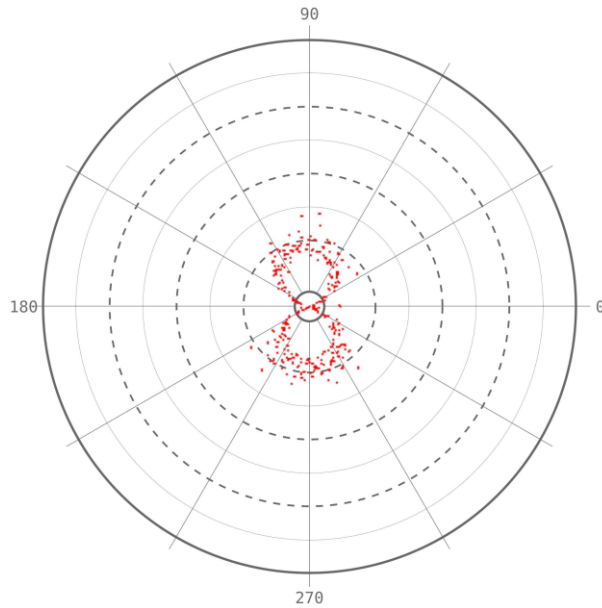
- Length: 139.2 m
- Beam: 13.0 m
- Draft: 10.4 m
- Displacement surfaced: 9600.0 tons
- Displacement dived: 11800.0 tons

**PERFORMANCE**

- Max speed: 35.0 kts
- Max depth: 600.0 m



RADAR RCS



**SENSORS**

- SONAR: MGK-600, spherical bow array, flank arrays, towed array, high frequency on sail, active intercept
- VISUAL: PZNS-10S periscope, Parus-98UP search optronic
- EW: R-43M-885A surface search, Radio DF
- RADAR: R-43M-885A surface search

**ARMAMENT**

- TORPEDO TUBES: 10x 21 in (533 mm)
- TUBE LAUNCHED WEAPONS: UGST-M HWT, MDM-1 Bottom Mine
- VLS TUBES: 8x VLS (4x missiles each)
- VLS LAUNCHED WEAPONS: 3M-14K LAM, 3M-54K ASM, 3M-54E ASM
- LAUNCHERS: 6x external (4x fore, 2x aft)
- DECOYS: MG-104 Brosok swimming simulator/decoy, MG-114 Berill torpedo decoy

**MACHINERY**

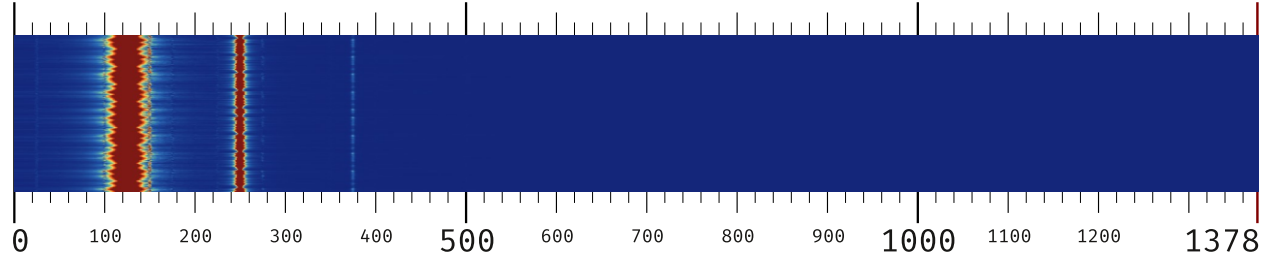
**PROPULSION**

- OK-650KPM nuclear fission reactor, 2x GT3A steam turbines
- Power: 2x 31 600 kW (43 000 shp)
- CMP: CONAS, Gear ratio: 16:1
- Engine RPM: 3600

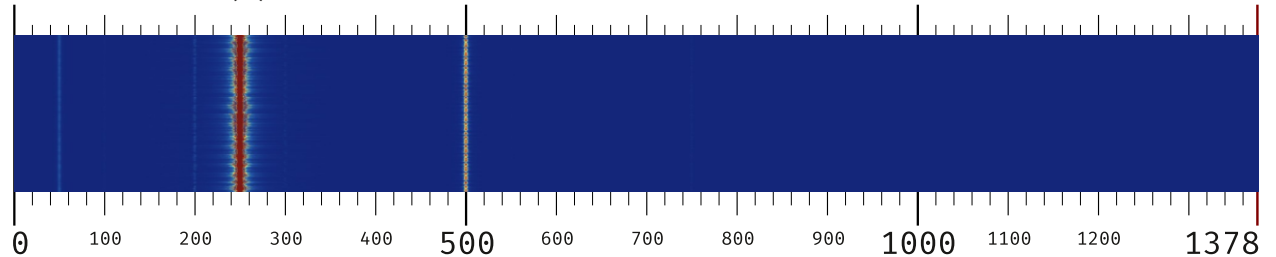
**SHAFT(S)**

- #: 1
- Type: High skewed
- Blades: 7
- Shaft RPM: 225

LOFARGRAM CRUISE SPEED (Hz)

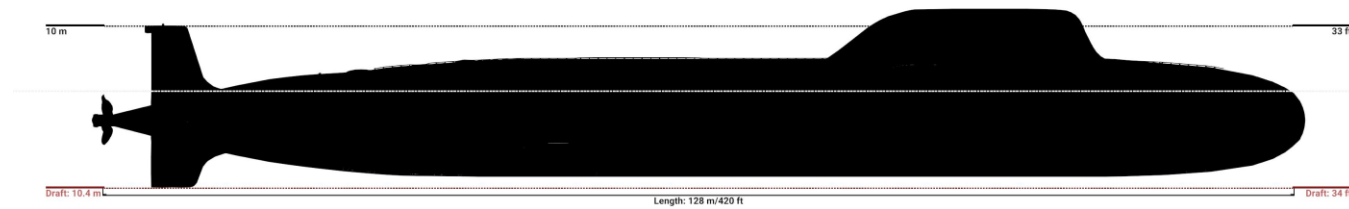


LOFARGRAM HIGH SPEED (Hz)



# A SSN - Project 885M Yasen-M (Severodvinsk)

## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



### SPECIFICATION

Modernized Yasen with a shortened hull, improved quieting, and upgraded digital sensor suites.

#### TYPE

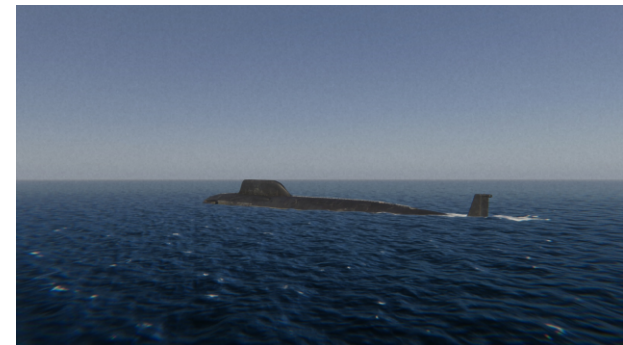
- Attack Submarine (Nuclear-Powered)
- Crew: 64

#### DIMENSIONS

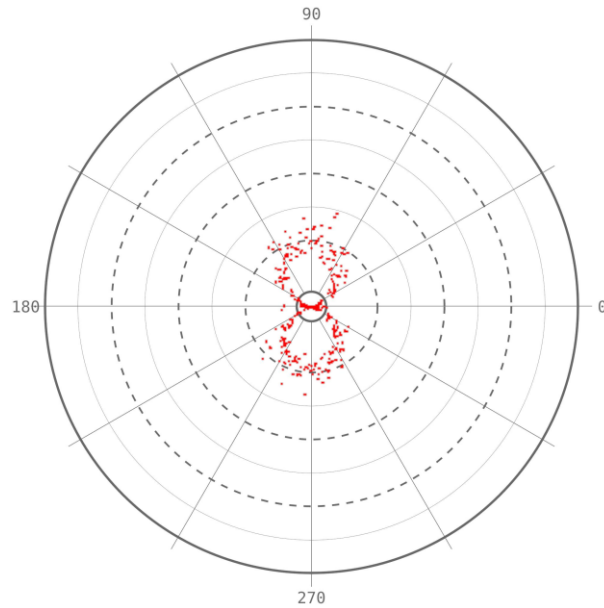
- Length: 130.0 m
- Beam: 13.0 m
- Draft: 10.4 m
- Displacement surfaced: 9600.0 tons
- Displacement dived: 11800.0 tons

#### PERFORMANCE

- Max speed: 35.0 kts
- Max depth: 600.0 m



RADAR RCS



**SENSORS**

- SONAR: MGK-600M, large conformal bow array, flank array, towed array, high frequency on sail, active intercept
- VISUAL: PZNS-10S periscope, Parus-98UP search optronic
- EW: R-43M-885A surface search, Radio DF
- RADAR: R-43M-885A surface search

**ARMAMENT**

- TORPEDO TUBES: 10x 21 in (533 mm)
- TUBE LAUNCHED WEAPONS: UGST-M HWT, MDM-1 Bottom Mine
- VLS TUBES: 8x VLS (4x missiles each)
- VLS LAUNCHED WEAPONS: 3M-14K LAM, 3M-54K ASM, 3M-54E ASM
- LAUNCHERS: 6x external (4x fore, 2x aft)
- DECOYS: MG-104 Brosok swimming simulator/decoy, MG-114 Berill torpedo decoy

**MACHINERY**

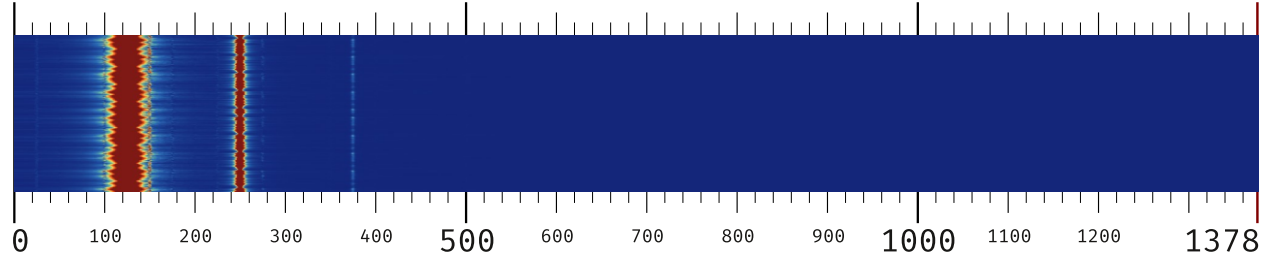
PROPULSION

- OK-650KPM nuclear fission reactor, 2x GT3A steam turbines
- Power: 2x 31 600 kW (43 000 shp)
- CMP: CONAS, Gear ratio: 16:1
- Engine RPM: 3600

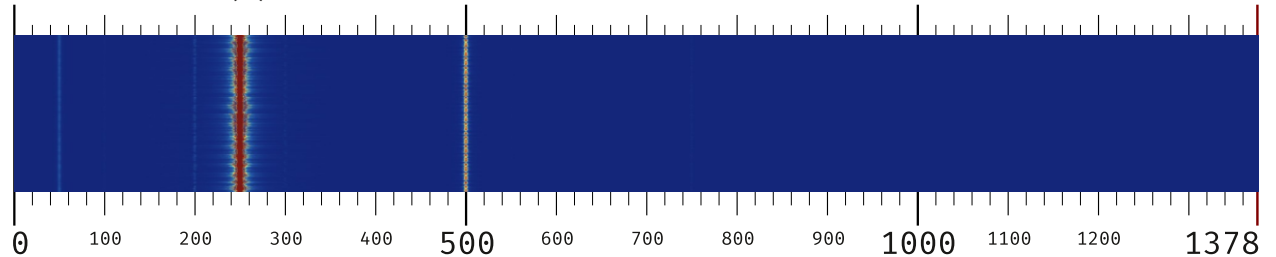
SHAFT(S)

- #: 1
- Type: High skewed
- Blades: 7
- Shaft RPM: 225

LOFARGRAM CRUISE SPEED (Hz)

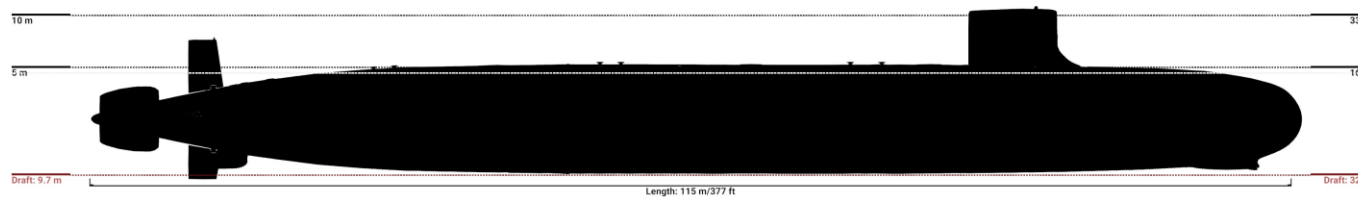


LOFARGRAM HIGH SPEED (Hz)



**A** SSN - SSN-774 Virginia Block I

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

Highly automated SSN optimized for both littoral and deep-sea ops. It utilizes pump-jet propulsion, non-penetrating photonics masts, advance sonar systems and best in class quietening.

**TYPE**

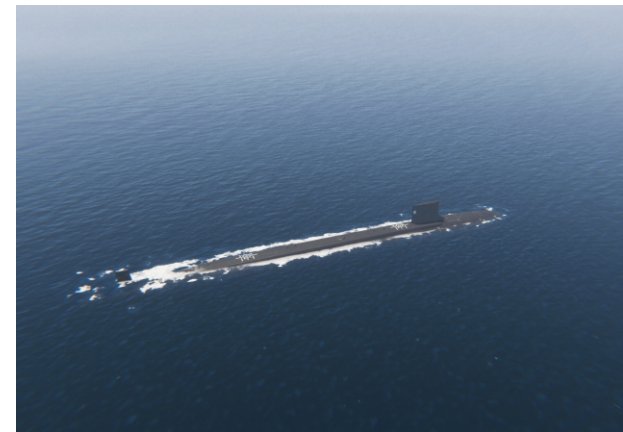
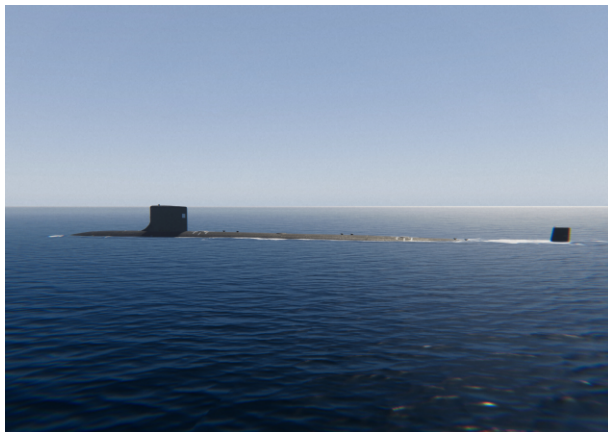
- Attack Submarine (Nuclear-Powered)
- Crew: 132

**DIMENSIONS**

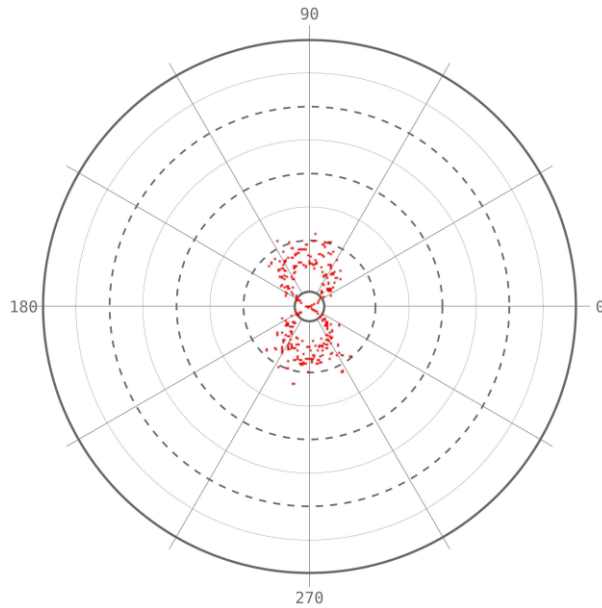
- Length: 115.0 m
- Beam: 10.4 m
- Draft: 9.7 m
- Displacement surfaced: 7000.0 tons
- Displacement dived: 7800.0 tons

**PERFORMANCE**

- Max speed: 34.0 kts
- Max depth: 366.0 m



RADAR RCS



**SENSORS**

- SONAR: BQQ-10 (ARCI), spherical bow array, wide Aperture flank array (LWAA) with range estimate (RAPLOC), fat line TB-16 towed array, thin line TB-23 towed array, high frequency bow array (HFBA) with sensors both on the sail and the chin area of the bow, AN/WLY-1 acoustic intercept receiver
- VISUAL: 2x AN/BVS-1 photonics
- EW: AN/BLQ-10 ESM suite with AN/BSD-2 mast
- RADAR: AN/BPS-16 surface/navigation

**ARMAMENT**

- TORPEDO TUBES: 4x 21 in (533 mm)
- TUBE LAUNCHED WEAPONS: MK-48 ADCAP HWT, UGM-84 Harpoon ASM, UGM-109 TLAM, MK-67 SLMM
- VLS TUBES: 12x VLS
- VLS LAUNCHED WEAPONS: UGM-109 TLAM
- LAUNCHERS: 2x ECL (7x 6 in decoys each), 2x ICL (manual 3 in payloads)
- DECOYS: ECL: ADC MK-3 sonar jammer, ADC MK-4 torpedo decoy; ICL: ADC MK-2 torpedo decoy, ADC MK-5 sonar jammer, XBT, SLEB, SLOT

**MACHINERY**

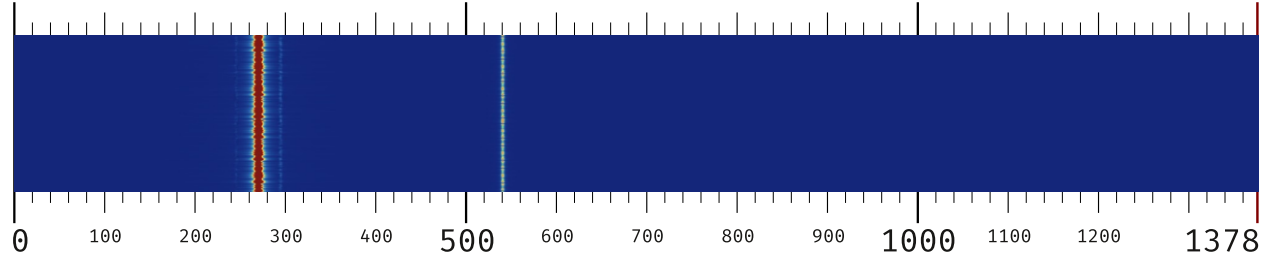
PROPULSION

- GE S9G pressurized water reactor, 2x steam turbines
- Power: 2x 29 800 kW (40 000 shp)
- CMP: CONAS, Gear ratio: 25:1
- Engine RPM: 5000

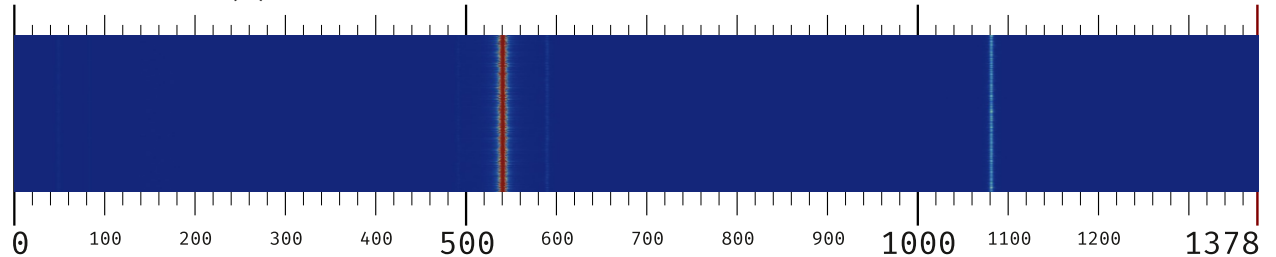
SHAFT(S)

- #: 1
- Type: Pump-jet propulsor
- Blades: 7
- Shaft RPM: 200

LOFARGRAM CRUISE SPEED (Hz)

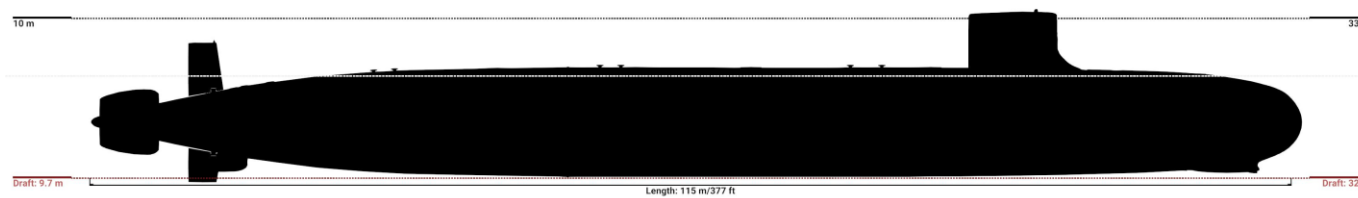


LOFARGRAM HIGH SPEED (Hz)



**A** SSN - SSN-774 Virginia Block II

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

Block II of the Virginia class utilizes modular construction techniques to reduce production costs while maintaining Block I acoustic performance.

**TYPE**

- Attack Submarine (Nuclear-Powered)
- Crew: 132

**DIMENSIONS**

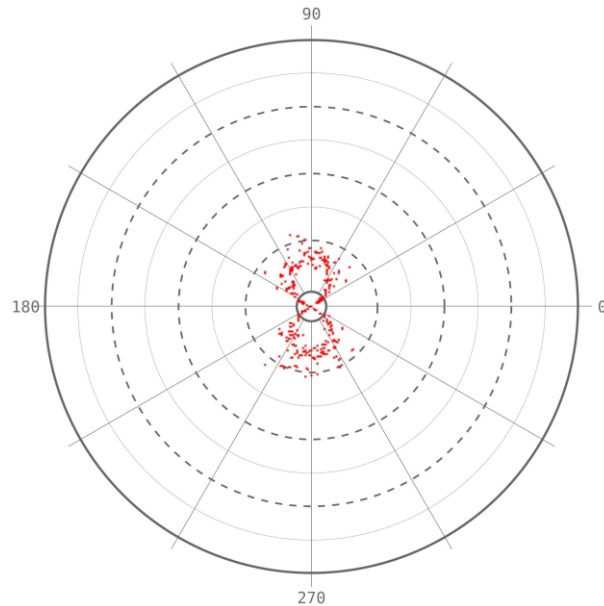
- Length: 115.0 m
- Beam: 10.4 m
- Draft: 9.7 m
- Displacement surfaced: 7000.0 tons
- Displacement dived: 7800.0 tons

**PERFORMANCE**

- Max speed: 34.0 kts
- Max depth: 366.0 m



RADAR RCS



**SENSORS**

- SONAR: BQQ-10 (ARCI), spherical bow array, wide Aperture flank array (LWAA) with range estimate (RAPLOC), fat line TB-16 towed array, thin line TB-29A towed array, high frequency bow array (HFBA) with sensors both on the sail and the chin area of the bow, AN/WLY-1 acoustic intercept receiver
- VISUAL: 2x AN/BVS-1 photonics
- EW: AN/BLQ-10 ESM suite with AN/BSD-2 mast
- RADAR: AN/BPS-16 surface/navigation

**ARMAMENT**

- TORPEDO TUBES: 4x 21 in (533 mm)
- TUBE LAUNCHED WEAPONS: MK-48 ADCAP HWT, UGM-84 Harpoon ASM, UGM-109 TLAM, MK-67 SLMM
- VLS TUBES: 12x VLS
- VLS LAUNCHED WEAPONS: UGM-109 TLAM
- LAUNCHERS: 2x ECL (7x 6 in decoys each), 2x ICL (manual 3 in payloads)
- DECOYS: ECL: ADC MK-3 sonar jammer, ADC MK-4 torpedo decoy; ICL: ADC MK-2 torpedo decoy, ADC MK-5 sonar jammer, XBT, SLEB, SLOT

**MACHINERY**

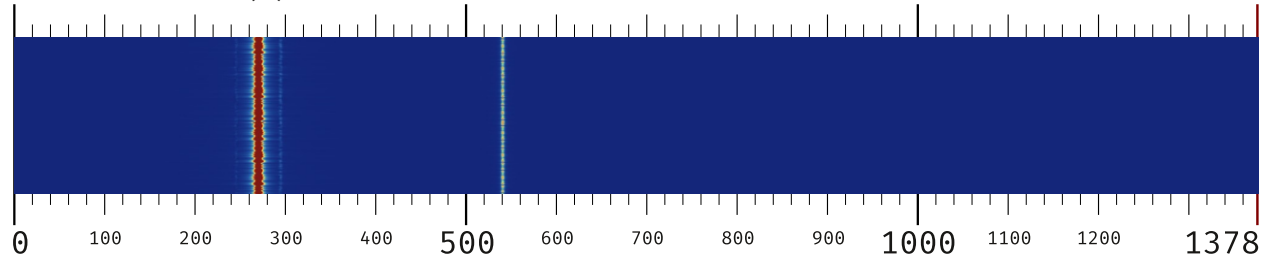
PROPULSION

- GE S9G pressurized water reactor, 2x steam turbines
- Power: 2x 29 800 kW (40 000 shp)
- CMP: CONAS, Gear ratio: 25:1
- Engine RPM: 5000

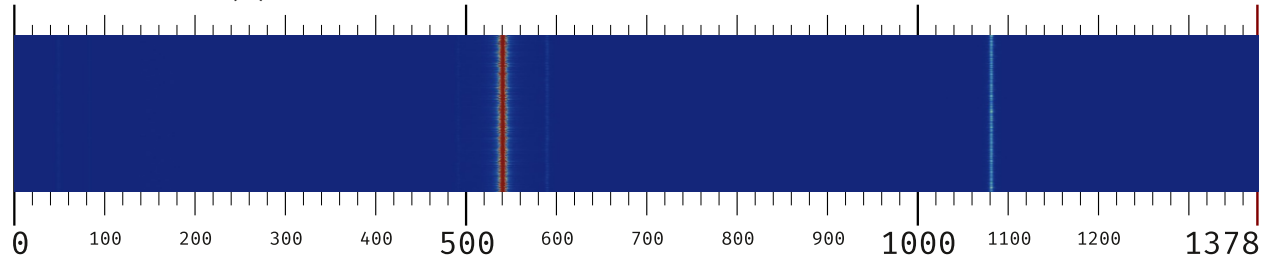
SHAFT(S)

- #: 1
- Type: Pump-jet propulsor
- Blades: 7
- Shaft RPM: 200

LOFARGRAM CRUISE SPEED (Hz)

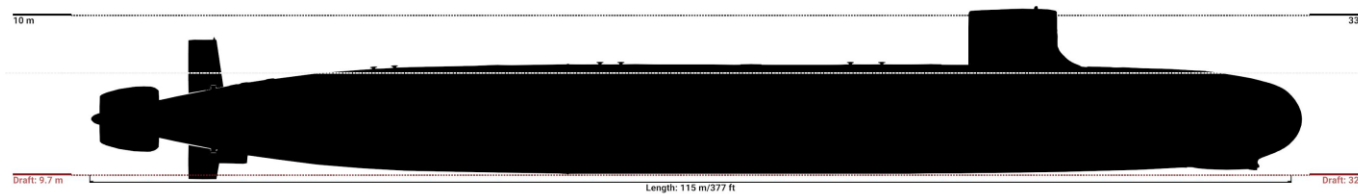


LOFARGRAM HIGH SPEED (Hz)



**A** SSN - SSN-774 Virginia Block III

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

Block III features a redesigned bow that includes the Large Aperture Bow (LAB) sonar and two Virginia Payload Tubes (VPT), each capable of carrying six Tomahawk missiles.

**TYPE**

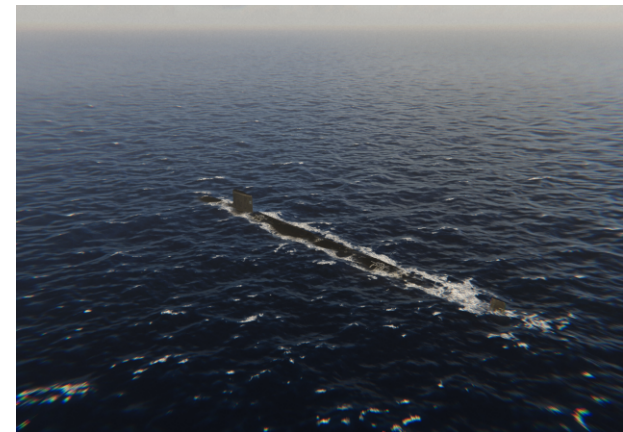
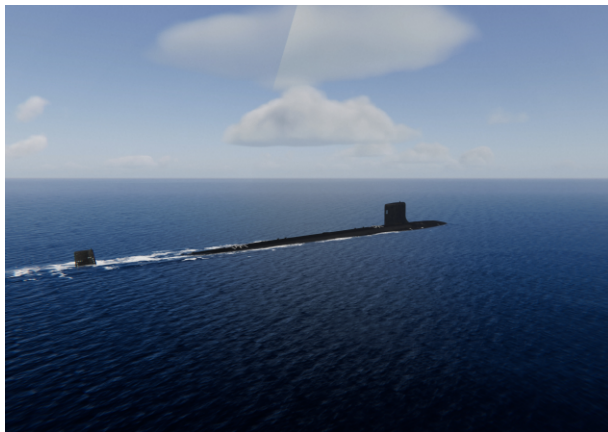
- Attack Submarine (Nuclear-Powered)
- Crew: 132

**DIMENSIONS**

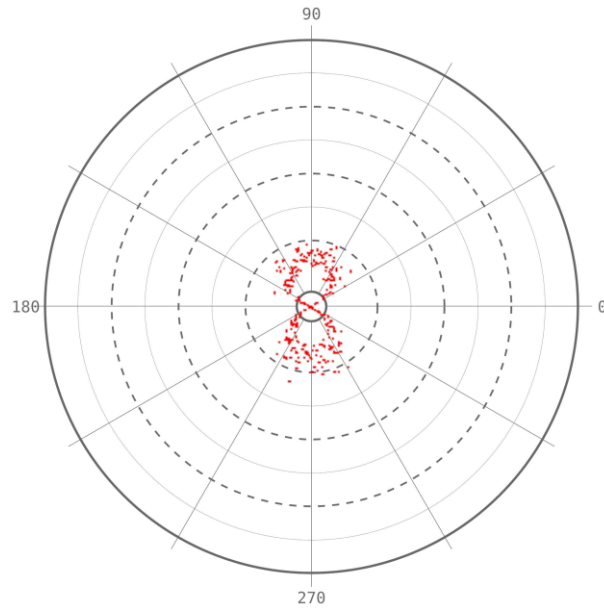
- Length: 115.0 m
- Beam: 10.4 m
- Draft: 9.7 m
- Displacement surfaced: 7000.0 tons
- Displacement dived: 7800.0 tons

**PERFORMANCE**

- Max speed: 34.0 kts
- Max depth: 366.0 m



RADAR RCS



**SENSORS**

- SONAR: BQQ-10 (ARCI), large aperture bow array, wide Aperture flank array (LWAA) with range estimate (RAPLOC), fat line TB-34 towed array, thin line TB-29A towed array, high frequency bow array (HFBA) with sensors both on the sail and the chin area of the bow, AN/WLY-1 acoustic intercept receiver
- VISUAL: 2x AN/BVS-1 photonics
- EW: AN/BLQ-10 ESM suite with AN/BSD-2 mast
- RADAR: AN/BPS-16 surface/navigation

**ARMAMENT**

- TORPEDO TUBES: 4x 21 in (533 mm)
- TUBE LAUNCHED WEAPONS: MK-48 ADCAP HWT, UGM-84 Harpoon ASM, UGM-109 TLAM, MK-67 SLMM
- VLS TUBES: 2x VPT (6x missiles each)
- VLS LAUNCHED WEAPONS: UGM-109 TLAM
- LAUNCHERS: 2x ECL (7x 6 in decoys each), 2x ICL (manual 3 in payloads)
- DECOYS: ECL: ADC MK-3 sonar jammer, ADC MK-4 torpedo decoy; ICL: ADC MK-2 torpedo decoy, ADC MK-5 sonar jammer, XBT, SLEB, SLOT

**MACHINERY**

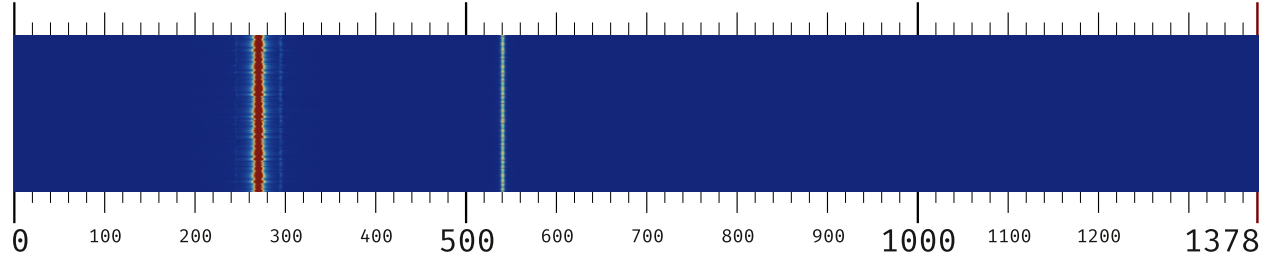
PROPULSION

- GE S9G pressurized water reactor, 2x steam turbines
- Power: 2x 29 800 kW (40 000 shp)
- CMP: CONAS, Gear ratio: 25:1
- Engine RPM: 5000

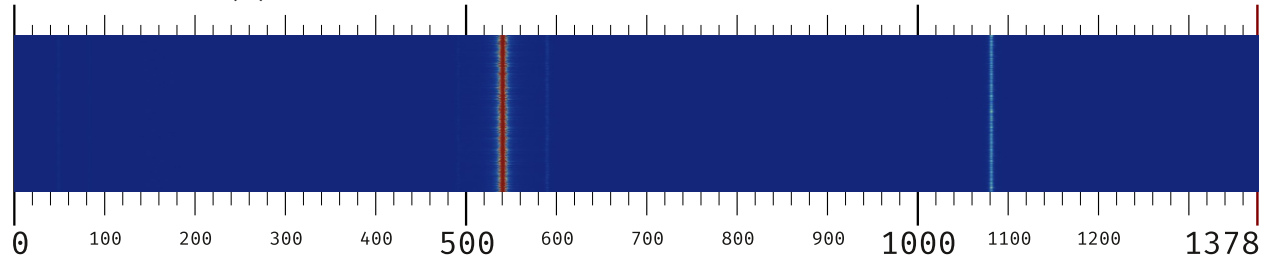
SHAFT(S)

- #: 1
- Type: Pump-jet propulsor
- Blades: 7
- Shaft RPM: 200

LOFARGRAM CRUISE SPEED (Hz)

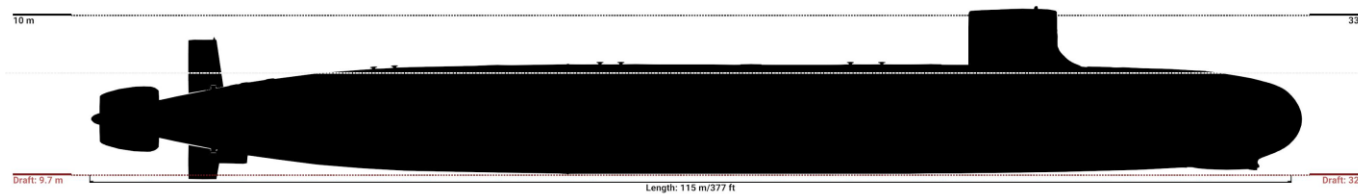


LOFARGRAM HIGH SPEED (Hz)



**A** SSN - SSN-774 Virginia Block IV

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

Block IV incorporates design changes to extend service life between major overhauls and improve overall hull availability.

**TYPE**

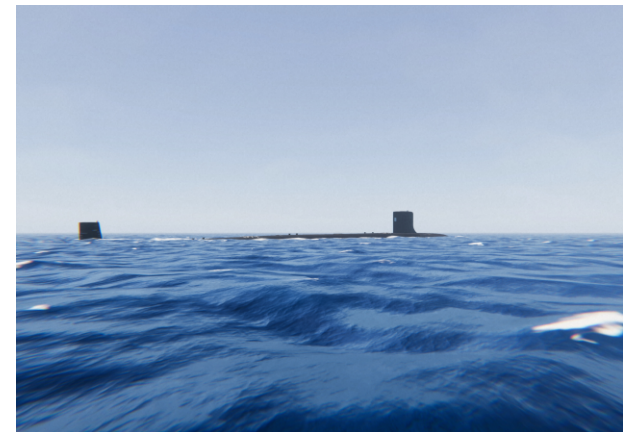
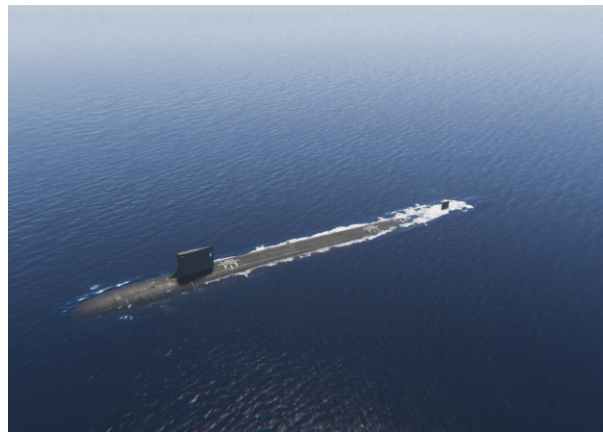
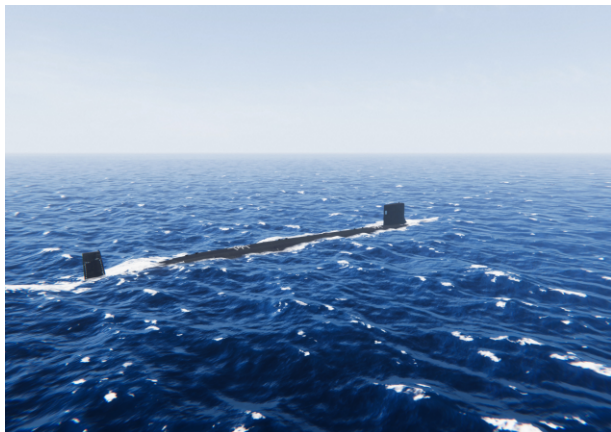
- Attack Submarine (Nuclear-Powered)
- Crew: 132

**DIMENSIONS**

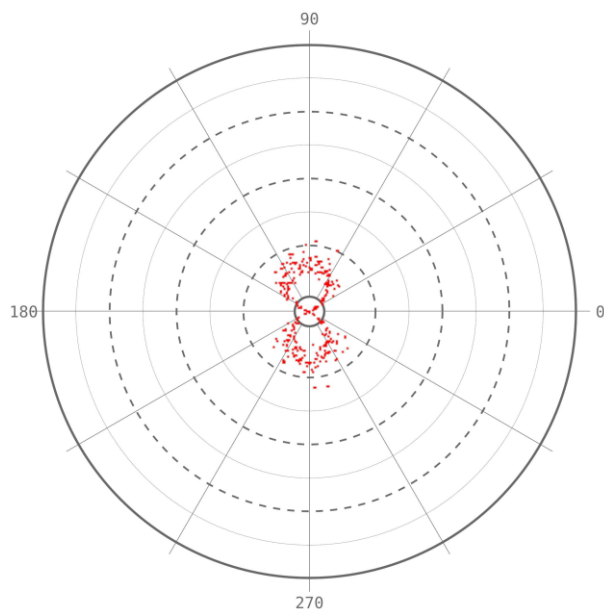
- Length: 115.0 m
- Beam: 10.4 m
- Draft: 9.7 m
- Displacement surfaced: 7000.0 tons
- Displacement dived: 7800.0 tons

**PERFORMANCE**

- Max speed: 34.0 kts
- Max depth: 366.0 m



RADAR RCS



**SENSORS**

- SONAR: BQQ-10 (ARCI), large aperture bow array, wide Aperture flank array (LWAA) with range estimate (RAPLOC), fat line TB-34 towed array, thin line TB-29A towed array, high frequency bow array (HFBA) with sensors both on the sail and the chin area of the bow, AN/WLY-1 acoustic intercept receiver
- VISUAL: 2x AN/BVS-1 photonics or 1x AN/BVS-1 photonics, 1x LPPM low profile photonics
- EW: AN/BLQ-10 ESM suite with AN/BSD-2 mast
- RADAR: AN/BPS-17 LPI surface/navigation

**ARMAMENT**

- TORPEDO TUBES: 4x 21 in (533 mm)
- TUBE LAUNCHED WEAPONS: MK-48 ADCAP HWT, UGM-84 Harpoon ASM, UGM-109 TLAM, MK-67 SLMM
- VLS TUBES: 2x VPT (6x missiles each)
- VLS LAUNCHED WEAPONS: UGM-109 TLAM
- LAUNCHERS: 2x ECL (7x 6 in decoys each), 2x ICL (manual 3 in payloads)
- DECOYS: ECL: ADC MK-3 sonar jammer, ADC MK-4 torpedo decoy; ICL: ADC MK-2 torpedo decoy, ADC MK-5 sonar jammer, XBT, SLEB, SLOT

**MACHINERY**

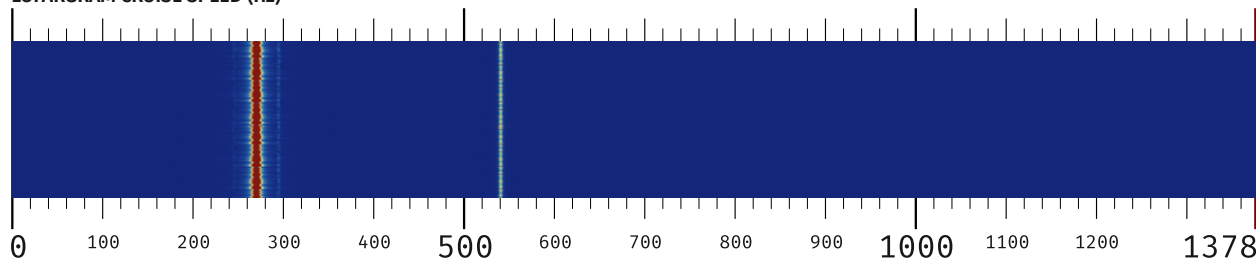
PROPULSION

- GE S9G pressurized water reactor, 2x steam turbines
- Power: 2x 29 800 kW (40 000 shp)
- CMP: CONAS, Gear ratio: 25:1
- Engine RPM: 5000

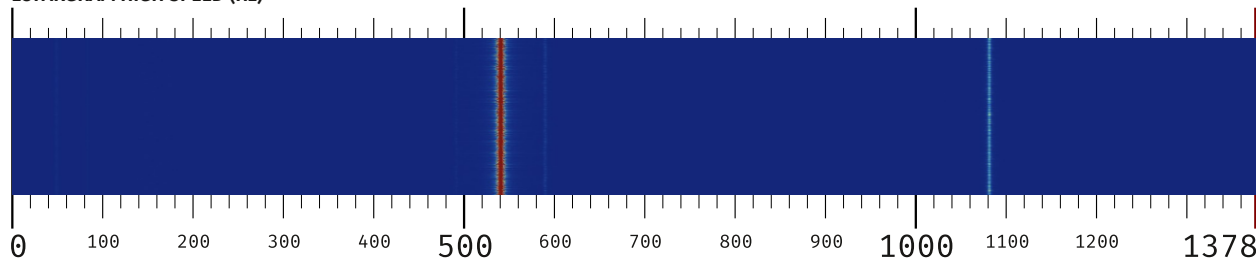
SHAFT(S)

- #: 1
- Type: Pump-jet propulsor
- Blades: 7
- Shaft RPM: 200

LOFARGRAM CRUISE SPEED (Hz)

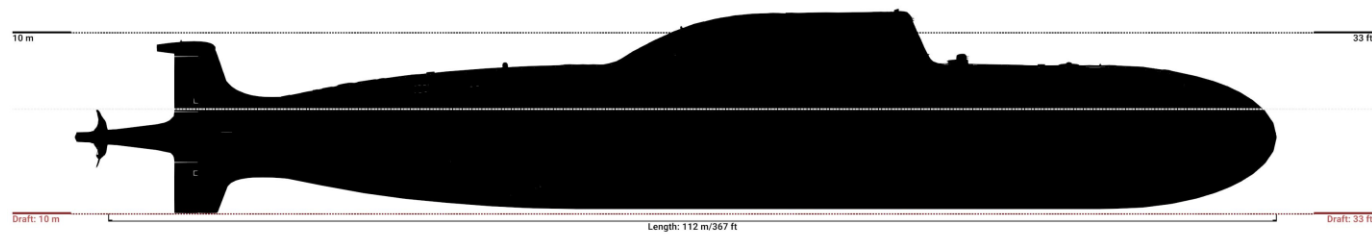


LOFARGRAM HIGH SPEED (Hz)



**A** SSN - Project 971M Shchuka-B (Akula III)

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

Peak Soviet SSN quieting. Easily identified by the hydrodynamic pod on the vertical stabilizer housing the towed array.

**TYPE**

- Attack Submarine (Nuclear-Powered)
- Crew: 62

**DIMENSIONS**

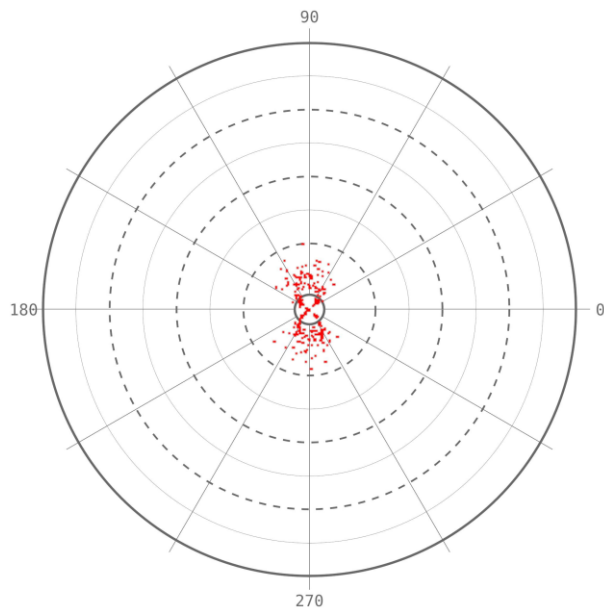
- Length: 113.3 m
- Beam: 13.6 m
- Draft: 10.4 m
- Displacement surfaced: 9246.0 tons
- Displacement dived: 9652.0 tons

**PERFORMANCE**

- Max speed: 35.0 kts
- Max depth: 600.0 m



RADAR RCS



**SENSORS**

- SONAR: MGK-540, cylindrical bow array, flank array, towed array, high frequency on sail, active intercept
- VISUAL: PZKE-21 attack periscope, Signal-3 search periscope
- EW: MRKP-59 Radian ESM, radio DF
- RADAR: MRKP-59 Radian surface search

**ARMAMENT**

- TORPEDO TUBES: 4x 21 in (533 mm), 4x 25.6 in (650 mm)
- TUBE LAUNCHED WEAPONS: UGST-M HWT, Shkval VA-111 HWT, 3M-14K LAM, 3M-54K ASM, MDM-1 Bottom Mine
- VLS TUBES: -
- VLS LAUNCHED WEAPONS: -
- LAUNCHERS: 6x external
- DECOYS: MG-74 Korund swimming simulator/decoy

**MACHINERY**

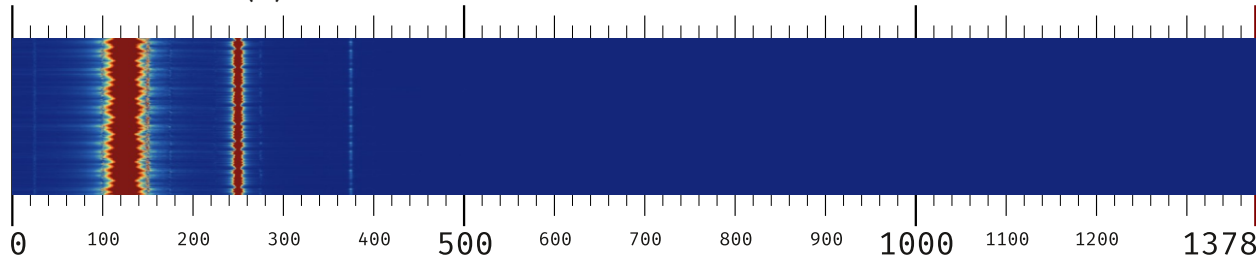
PROPULSION

- OK-650B nuclear fission reactor, 2x GT3A steam turbines
- Power: 2x 31 600 kW (43 000 shp)
- CMP: CONAS, Gear ratio: 16:1
- Engine RPM: 3600

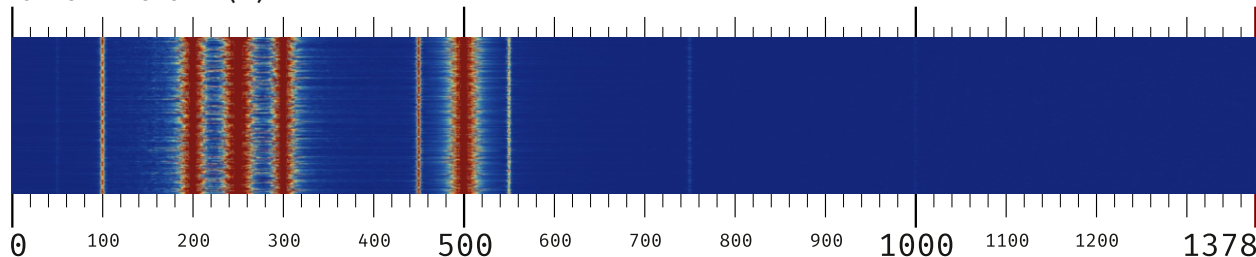
SHAFT(S)

- #: 1
- Type: High skewed
- Blades: 7
- Shaft RPM: 225

LOFARGRAM CRUISE SPEED (Hz)

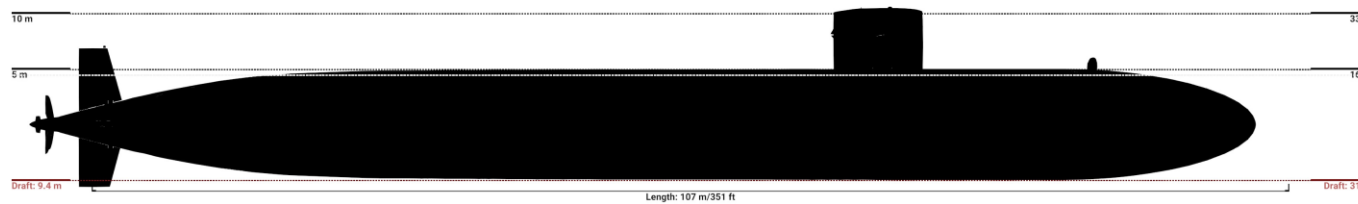


LOFARGRAM HIGH SPEED (Hz)



# A SSN - SSN-688 Los Angeles Flight I

## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



### SPECIFICATION

Classic Cold War-era fast attack submarine. Flight I boats feature sail planes and a high-performance S6G nuclear reactor.

#### TYPE

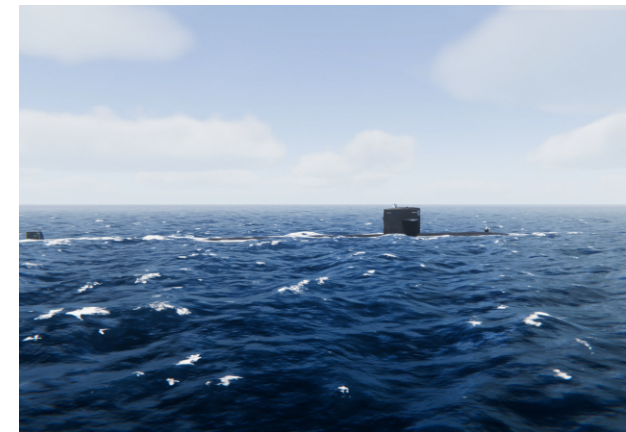
- Attack Submarine (Nuclear-Powered)
- Crew: 129

#### DIMENSIONS

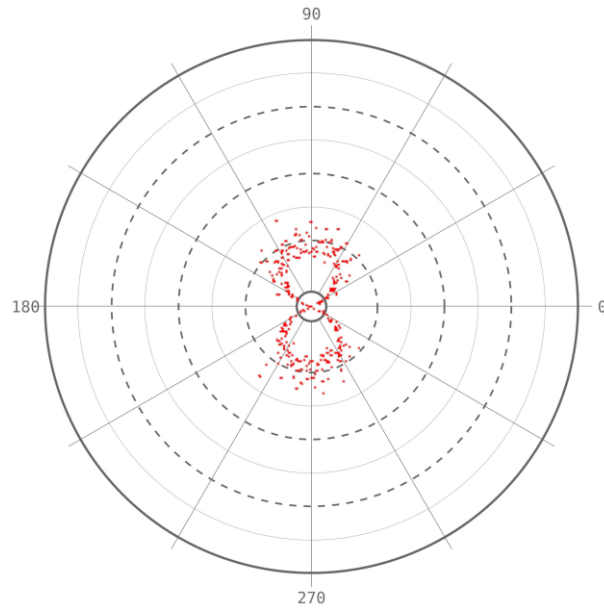
- Length: 110.0 m
- Beam: 10.4 m
- Draft: 9.4 m
- Displacement surfaced: 6082.0 tons
- Displacement dived: 6927.0 tons

#### PERFORMANCE

- Max speed: 33.0 kts
- Max depth: 290.0 m



RADAR RCS



**SENSORS**

- SONAR: BQQ-5, spherical bow array, fat line TB-16 towed array, thin line TB-23 towed array, high frequency bow array (HFBA) with sensors both on the sail, AN/WLR-9 acoustic intercept receiver
- VISUAL: Type 2 attack periscope, Type 18 search periscope
- EW: AN/WLR-8 ESM
- RADAR: AN/BPS-15 surface/navigation

**ARMAMENT**

- TORPEDO TUBES: 4x 21 in (533 mm)
- TUBE LAUNCHED WEAPONS: MK-48 ADCAP HWT, UGM-84 Harpoon ASM, UGM-109 TLAM, MK-67 SLMM
- VLS TUBES: -
- VLS LAUNCHED WEAPONS: -
- LAUNCHERS: 2x ICL (manual 3 in payloads)
- DECOYS: ADC MK-2 torpedo decoy, ADC MK-5 sonar jammer, XBT, SLEB, SLOT

**MACHINERY**

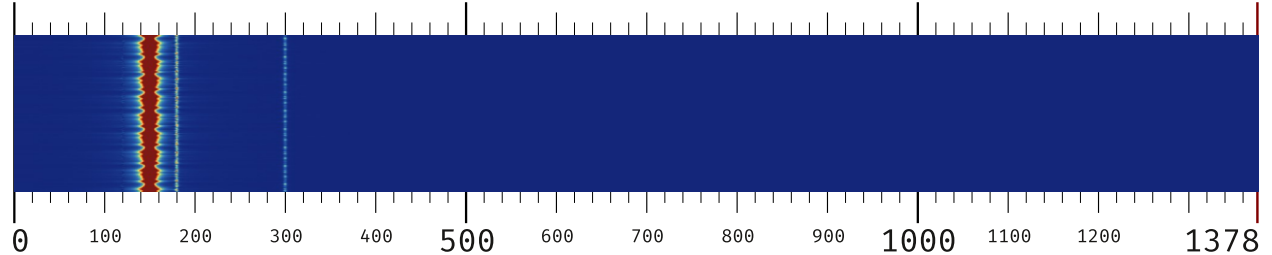
PROPULSION

- GE S6G pressurized water reactor, 2x steam turbines
- Power: 2x 26 000 kW (35 000 shp)
- CMP: CONAS, Gear ratio: 17:1
- Engine RPM: 4000

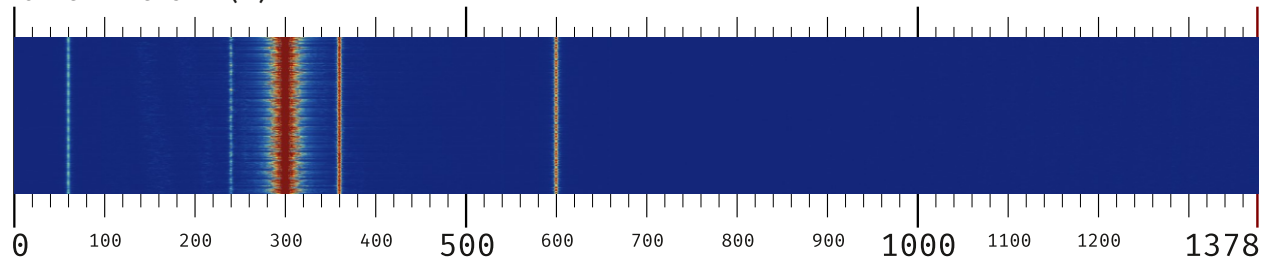
SHAFT(S)

- #: 1
- Type: High skewed
- Blades: 7
- Shaft RPM: 235

LOFARGRAM CRUISE SPEED (Hz)

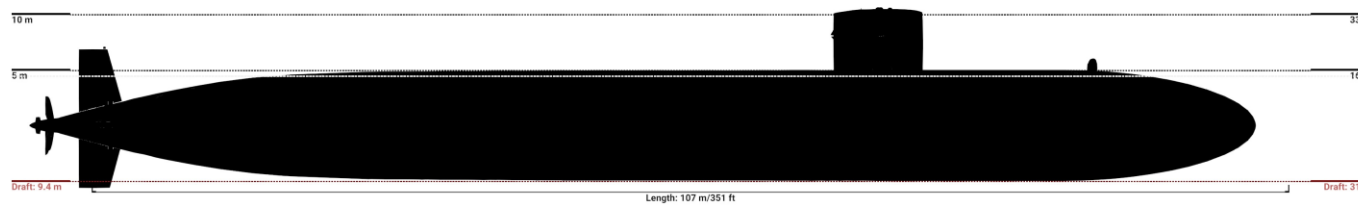


LOFARGRAM HIGH SPEED (Hz)



**A** SSN - SSN-688 Los Angeles Flight II

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

Introduction of the 12-tube Vertical Launch System (VLS) in the bow for Tomahawk cruise missile integration.

**TYPE**

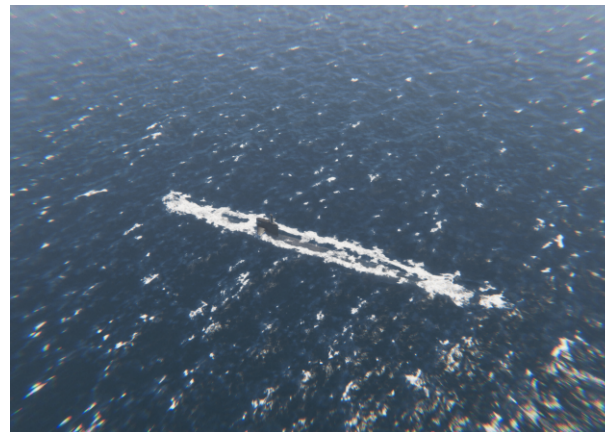
- Attack Submarine (Nuclear-Powered)
- Crew: 129

**DIMENSIONS**

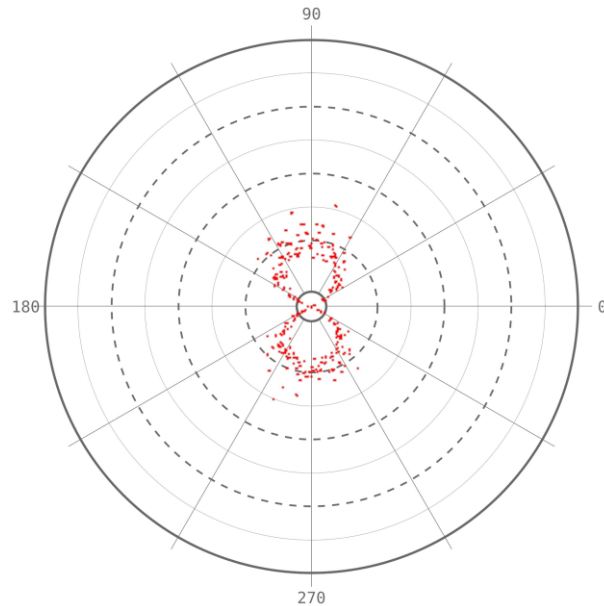
- Length: 110.0 m
- Beam: 10.4 m
- Draft: 9.4 m
- Displacement surfaced: 6082.0 tons
- Displacement dived: 6927.0 tons

**PERFORMANCE**

- Max speed: 33.0 kts
- Max depth: 290.0 m



RADAR RCS



**SENSORS**

- SONAR: BQQ-5, spherical bow array, fat line TB-16 towed array, thin line TB-23 towed array, high frequency bow array (HFBA) with sensors both on the sail, AN/WLR-9 acoustic intercept receiver
- VISUAL: Type 2 attack periscope, Type 18 search periscope
- EW: AN/WLR-8 ESM
- RADAR: AN/BPS-15 surface/navigation

**ARMAMENT**

- TORPEDO TUBES: 4x 21 in (533 mm)
- TUBE LAUNCHED WEAPONS: MK-48 ADCAP HWT, UGM-84 Harpoon ASM, UGM-109 TLAM, MK-67 SLMM
- VLS TUBES: 12x VLS
- VLS LAUNCHED WEAPONS: UGM-109 TLAM
- LAUNCHERS: 2x ICL (manual 3 in payloads)
- DECOYS: ADC MK-2 torpedo decoy, ADC MK-5 sonar jammer, XBT, SLEB, SLOT

**MACHINERY**

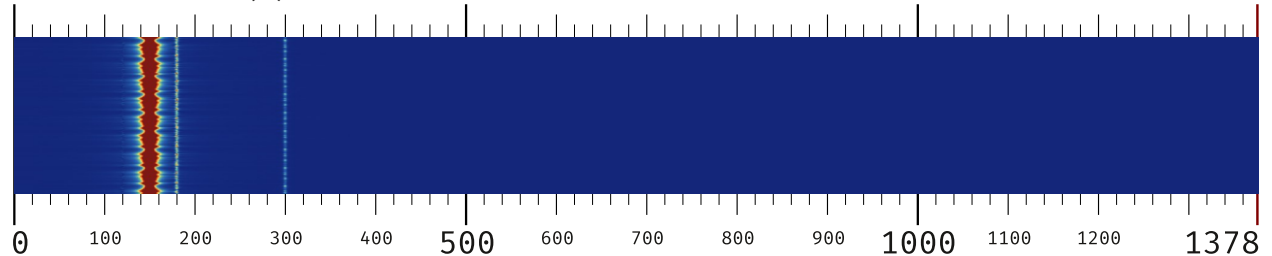
PROPULSION

- GE S6G pressurized water reactor, 2x steam turbines
- Power: 2x 26 000 kW (35 000 shp)
- CMP: CONAS, Gear ratio: 17:1
- Engine RPM: 4000

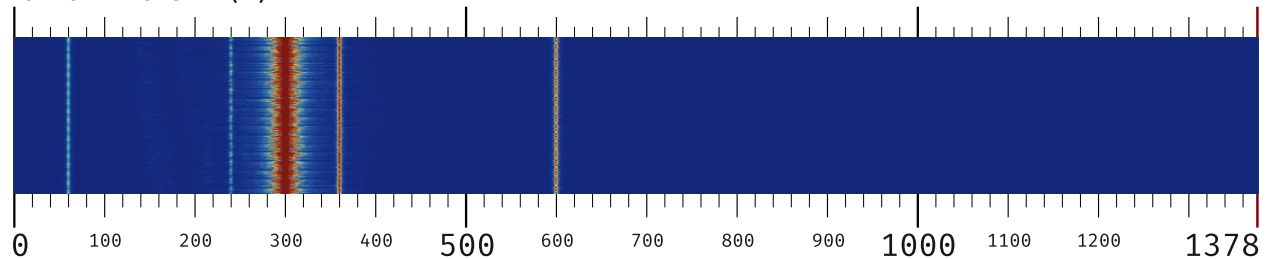
SHAFT(S)

- #: 1
- Type: High skewed
- Blades: 7
- Shaft RPM: 235

LOFARGRAM CRUISE SPEED (Hz)

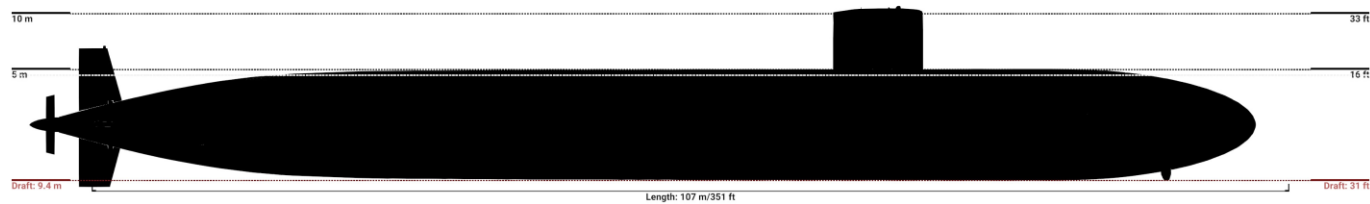


LOFARGRAM HIGH SPEED (Hz)



**A** SSN - SSN-688i Los Angeles Improved Flight III

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

Flight III "Improved" standard. Features retractable bow planes for under-ice operations and the advanced BSY-1 combat system.

**TYPE**

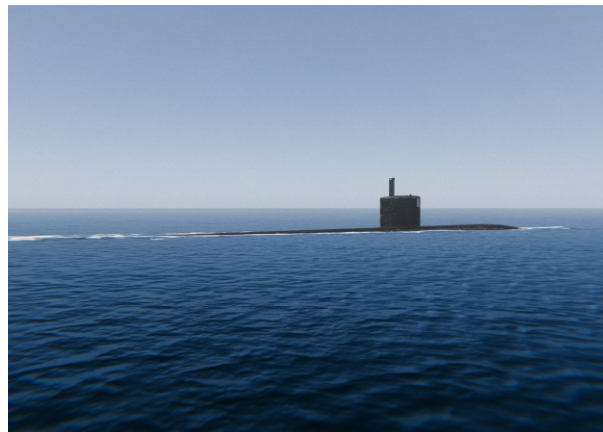
- Attack Submarine (Nuclear-Powered)
- Crew: 129

**DIMENSIONS**

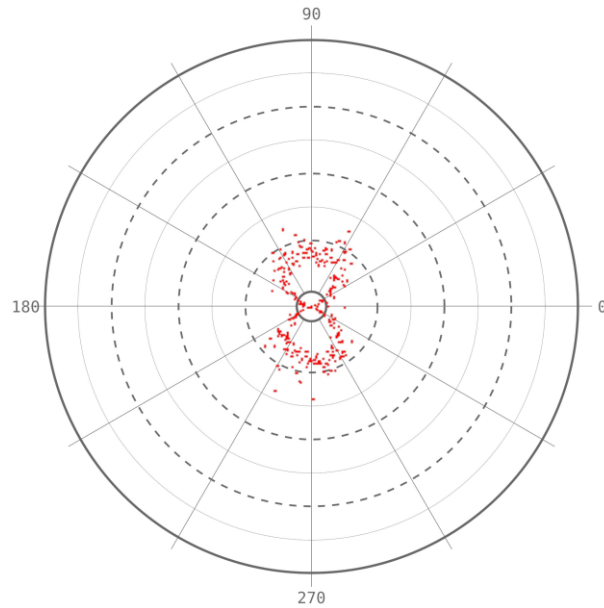
- Length: 110.0 m
- Beam: 10.4 m
- Draft: 9.4 m
- Displacement surfaced: 6082.0 tons
- Displacement dived: 6927.0 tons

**PERFORMANCE**

- Max speed: 33.0 kts
- Max depth: 290.0 m



RADAR RCS



**SENSORS**

- SONAR: BQQ-5, spherical bow array, fat line TB-16 towed array, thin line TB-23 towed array, high frequency bow array (HFBA) with sensors both on the sail, AN/WLR-9 acoustic intercept receiver
- VISUAL: Type 2 attack periscope, Type 18 search periscope
- EW: AN/WLR-8 ESM
- RADAR: AN/BPS-15 surface/navigation

**ARMAMENT**

- TORPEDO TUBES: 4x 21 in (533 mm)
- TUBE LAUNCHED WEAPONS: MK-48 ADCAP HWT, UGM-84 Harpoon ASM, UGM-109 TLAM, MK-67 SLMM
- VLS TUBES: 12x VLS
- VLS LAUNCHED WEAPONS: UGM-109 TLAM
- LAUNCHERS: 2x ICL (manual 3 in payloads)
- DECOYS: ADC MK-2 torpedo decoy, ADC MK-5 sonar jammer, XBT, SLEB, SLOT

**MACHINERY**

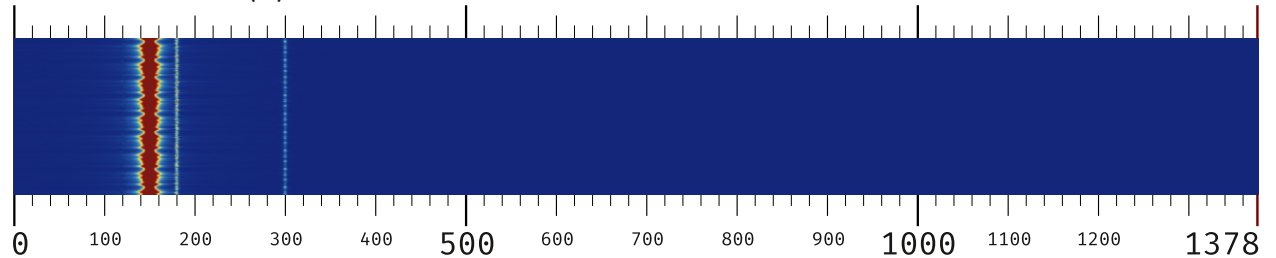
PROPULSION

- GE S6G pressurized water reactor, 2x steam turbines
- Power: 2x 26 000 kW (35 000 shp)
- CMP: CONAS, Gear ratio: 17:1
- Engine RPM: 4000

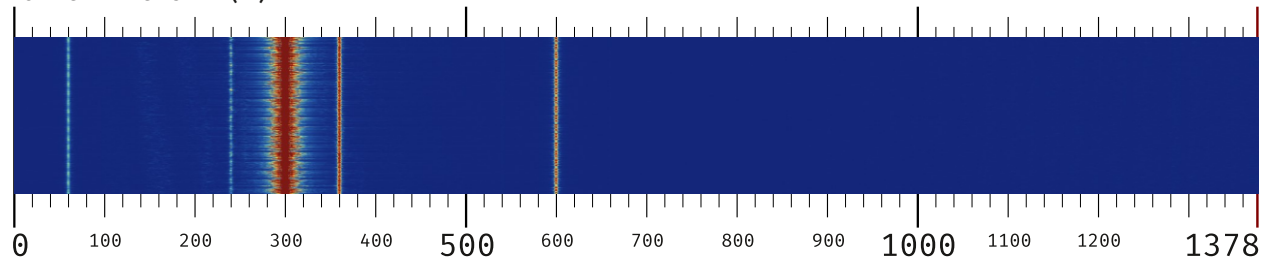
SHAFT(S)

- #: 1
- Type: Ringed skewed
- Blades: 7
- Shaft RPM: 235

LOFARGRAM CRUISE SPEED (Hz)

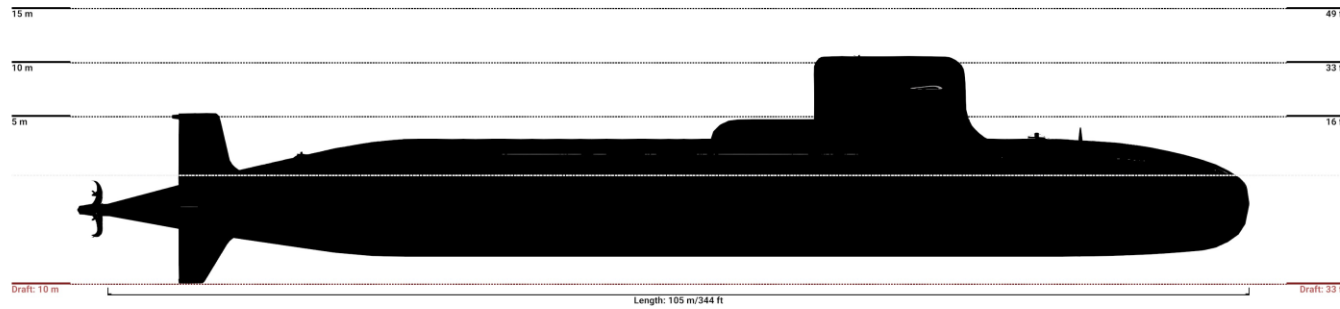


LOFARGRAM HIGH SPEED (Hz)



**A** SSN - Type 093A v1 Shang II

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

Modernized Shang featuring a refined sail profile and improved acoustic quieting for blue-water escort duties.

**TYPE**

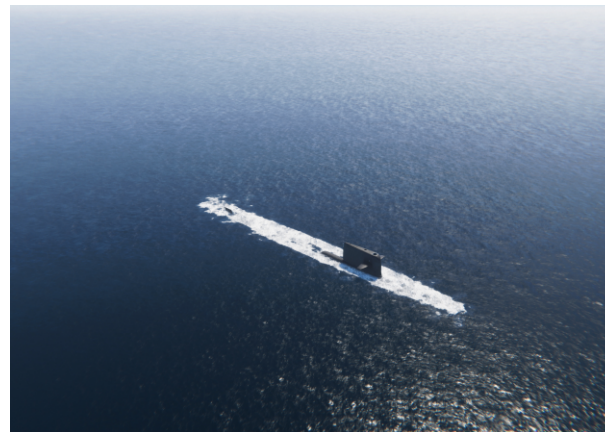
- Attack Submarine (Nuclear-Powered)
- Crew: 105

**DIMENSIONS**

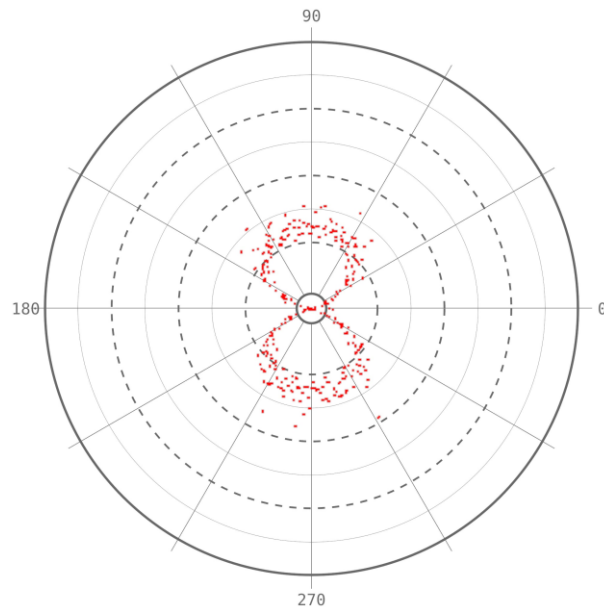
- Length: 108.5 m
- Beam: 11.0 m
- Draft: 7.5 m
- Displacement surfaced: 5300.0 tons
- Displacement dived: 6675.0 tons

**PERFORMANCE**

- Max speed: 30.0 kts
- Max depth: 300.0 m



RADAR RCS



**SENSORS**

- SONAR: H/SQG-207, cylindrical bow array, flank array, towed array, active intercept
- VISUAL: Attack periscope, search periscope
- EW: Type 921-A ESM/RWR
- RADAR: Type 359 surface/aerial search

**ARMAMENT**

- TORPEDO TUBES: 6x 21 in (533 mm)
- TUBE LAUNCHED WEAPONS: Yu-6 HWT, Yu-9 HWT, YJ-83 ASM
- VLS TUBES: -
- VLS LAUNCHED WEAPONS: -
- LAUNCHERS: -
- DECOYS: -

**MACHINERY**

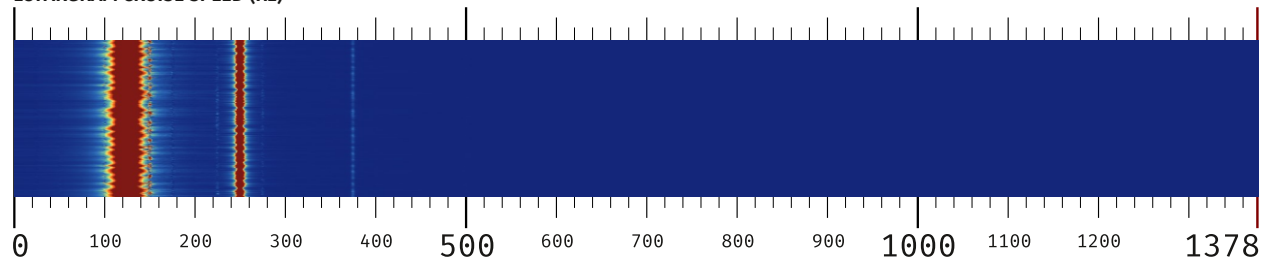
PROPULSION

- 2x pressurized water reactors, 2x steam turbines
- Power: 2x 11 150 kW (15 000 shp)
- CMP: CONAS, Gear ratio: 15.5:1
- Engine RPM: 3800

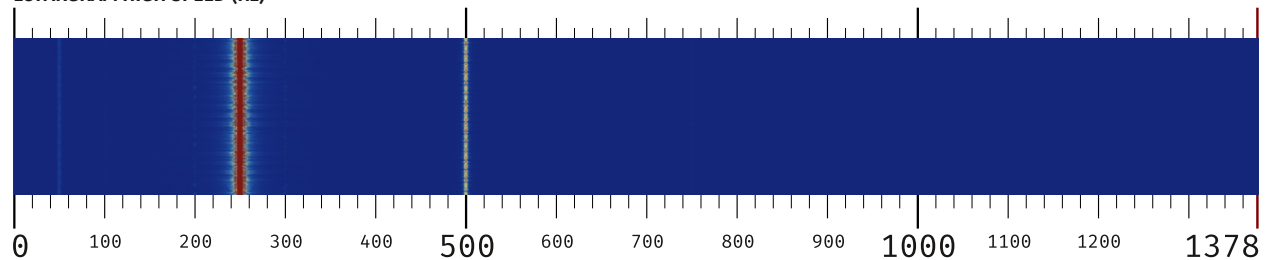
SHAFT(S)

- #: 1
- Type: Skewed
- Blades: 7
- Shaft RPM: 245

LOFARGRAM CRUISE SPEED (Hz)

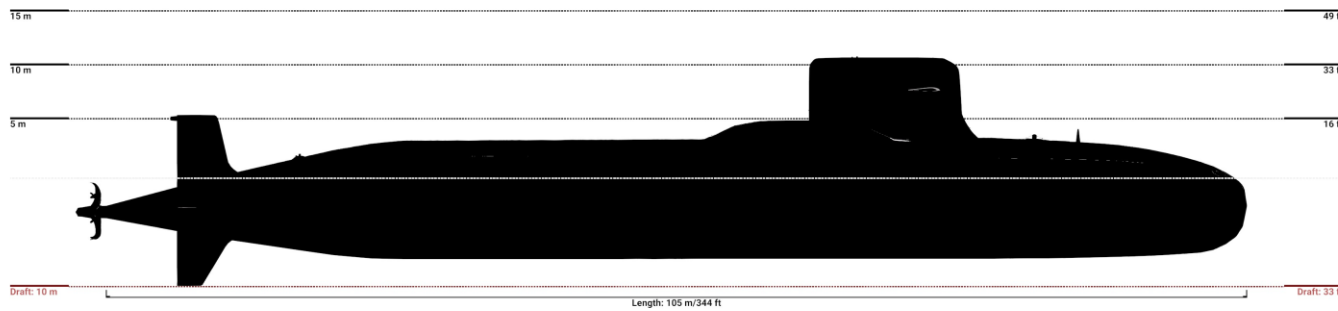


LOFARGRAM HIGH SPEED (Hz)



**A** SSN - Type 093A v2 Shang II

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

Second-revision Shang II with updated flank-array sonar and minor hydrodynamic refinements to the casing.

**TYPE**

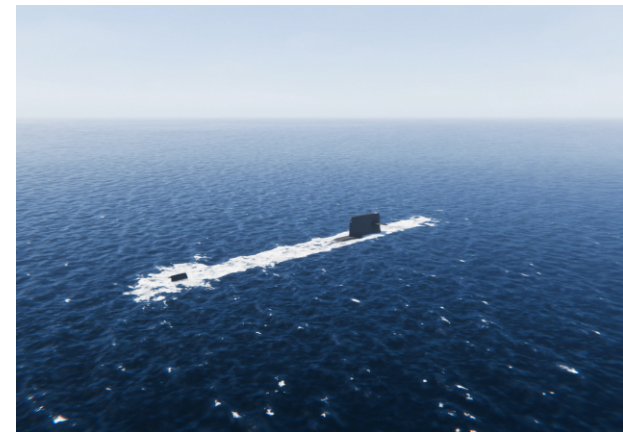
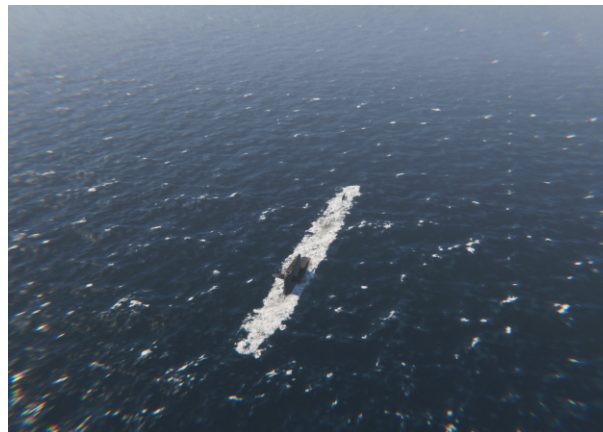
- Attack Submarine (Nuclear-Powered)
- Crew: 105

**DIMENSIONS**

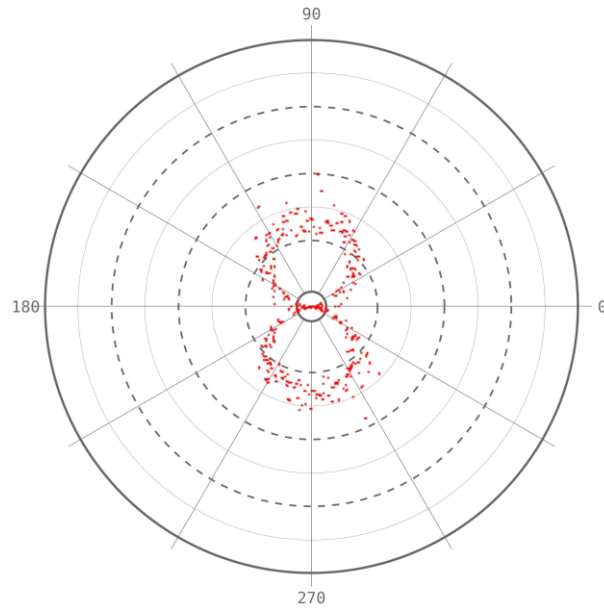
- Length: 108.5 m
- Beam: 11.0 m
- Draft: 7.5 m
- Displacement surfaced: 5300.0 tons
- Displacement dived: 6675.0 tons

**PERFORMANCE**

- Max speed: 30.0 kts
- Max depth: 300.0 m



RADAR RCS



**SENSORS**

- SONAR: H/SQG-207, cylindrical bow array, flank array, towed array, active intercept
- VISUAL: Attack periscope, search periscope
- EW: Type 921-A ESM/RWR
- RADAR: Type 359 surface/aerial search

**ARMAMENT**

- TORPEDO TUBES: 6x 21 in (533 mm)
- TUBE LAUNCHED WEAPONS: Yu-6 HWT, Yu-9 HWT, YJ-83 ASM
- VLS TUBES: -
- VLS LAUNCHED WEAPONS: -
- LAUNCHERS: -
- DECOYS: -

**MACHINERY**

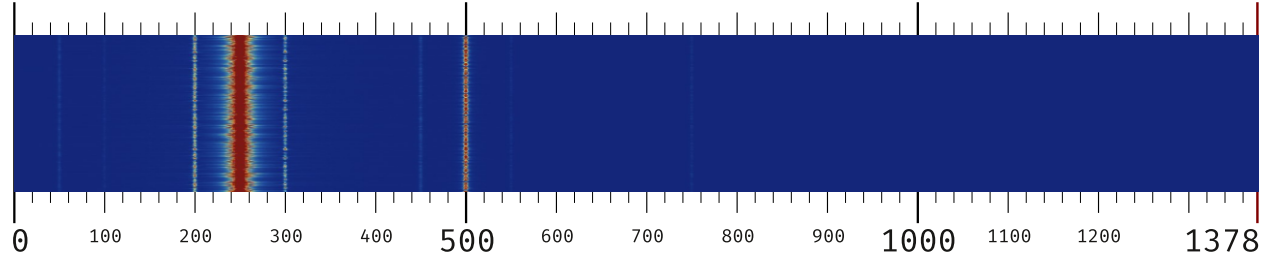
PROPULSION

- 2x pressurized water reactors, 2x steam turbines
- Power: 2x 11 150 kW (15 000 shp)
- CMP: CONAS, Gear ratio: 15.5:1
- Engine RPM: 3800

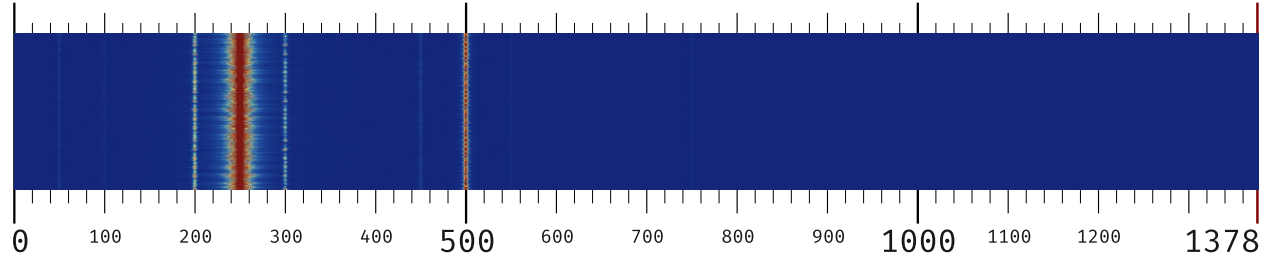
SHAFT(S)

- #: 1
- Type: Skewed
- Blades: 7
- Shaft RPM: 245

LOFARGRAM CRUISE SPEED (Hz)

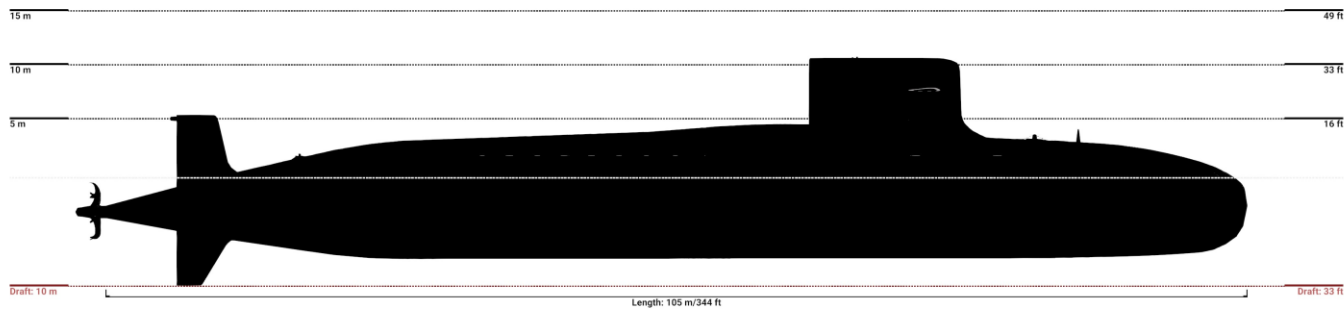


LOFARGRAM HIGH SPEED (Hz)



**A** SSN - Type 093A v3 Shang II

IDENTIFICATION AND CHARACTERISTICS DIAGRAM



**SPECIFICATION**

Further improvement to the Shang II, distinguished by a more hydrodynamic "hump" behind the sail and enhanced electronic warfare suites.

**TYPE**

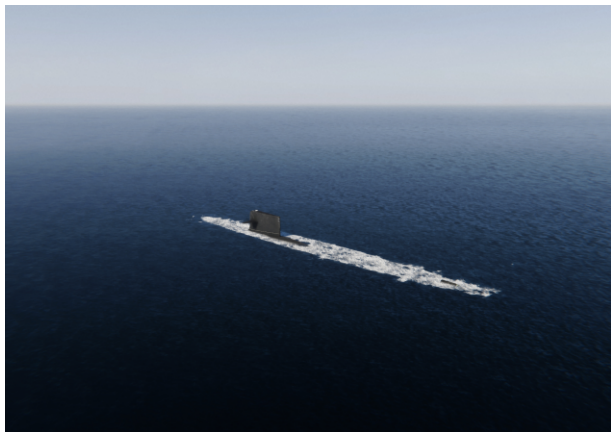
- Attack Submarine (Nuclear-Powered)
- Crew: 105

**DIMENSIONS**

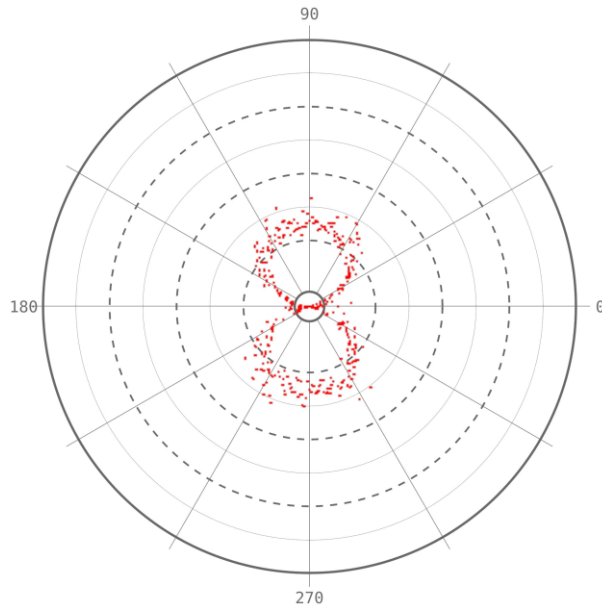
- Length: 108.5 m
- Beam: 11.0 m
- Draft: 7.5 m
- Displacement surfaced: 5300.0 tons
- Displacement dived: 6675.0 tons

**PERFORMANCE**

- Max speed: 30.0 kts
- Max depth: 300.0 m



RADAR RCS



**SENSORS**

- SONAR: H/SQG-207, cylindrical bow array, flank array, towed array, active intercept
- VISUAL: Attack periscope, search periscope
- EW: Type 921-A ESM/RWR
- RADAR: Type 359 surface/aerial search

**ARMAMENT**

- TORPEDO TUBES: 6x 21 in (533 mm)
- TUBE LAUNCHED WEAPONS: Yu-6 HWT, Yu-9 HWT, YJ-83 ASM
- VLS TUBES: -
- VLS LAUNCHED WEAPONS: -
- LAUNCHERS: -
- DECOYS: -

**MACHINERY**

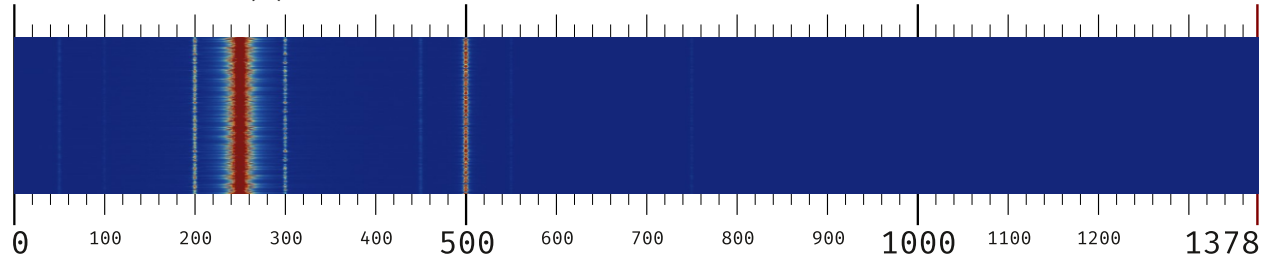
PROPULSION

- 2x pressurized water reactors, 2x steam turbines
- Power: 2x 11 150 kW (15 000 shp)
- CMP: CONAS, Gear ratio: 15.5:1
- Engine RPM: 3800

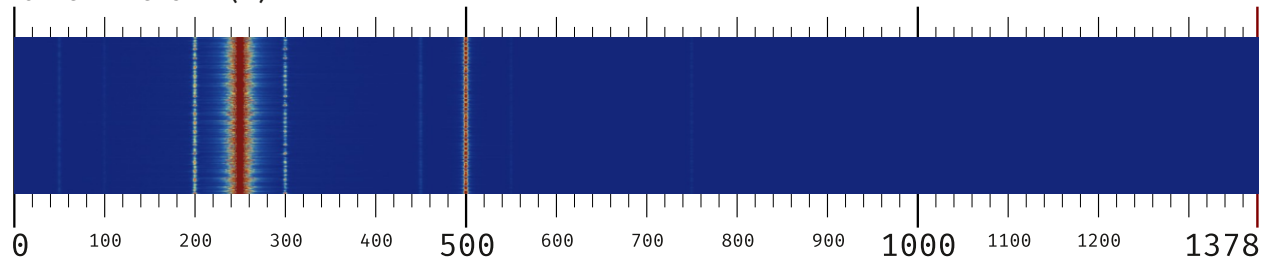
SHAFT(S)

- #: 1
- Type: Skewed
- Blades: 7
- Shaft RPM: 245

LOFARGRAM CRUISE SPEED (Hz)



LOFARGRAM HIGH SPEED (Hz)



# 3. CIVILIAN VESSELS



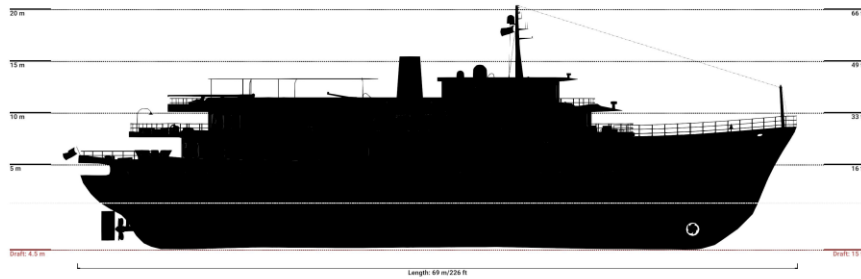
**THIS PAGE INTENTIONALLY LEFT BLANK**



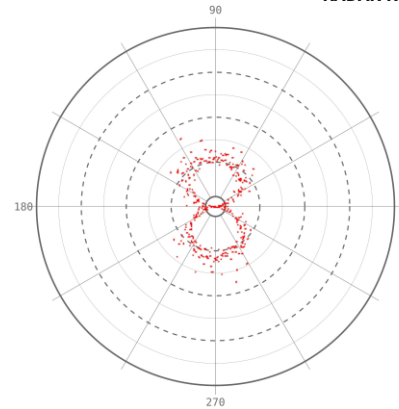
# ▶ Presidential Yacht



## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

Ultra-luxury explorer yacht with a converted commercial-spec hull that features a massive 24m mast, reinforced steel construction for high-latitude cruising and extensive VIP accommodations for diplomatic summits.

**TYPE**  
• Pleasure

**DIMENSIONS**  
• Length: 69.7 m  
• Beam: 13.2 m  
• Draft: 4.5 m  
• Displacement: 1550.0 tons

**SPEEDS**  
• Max: 13.0 kts  
• Cruise: 8.0 kts

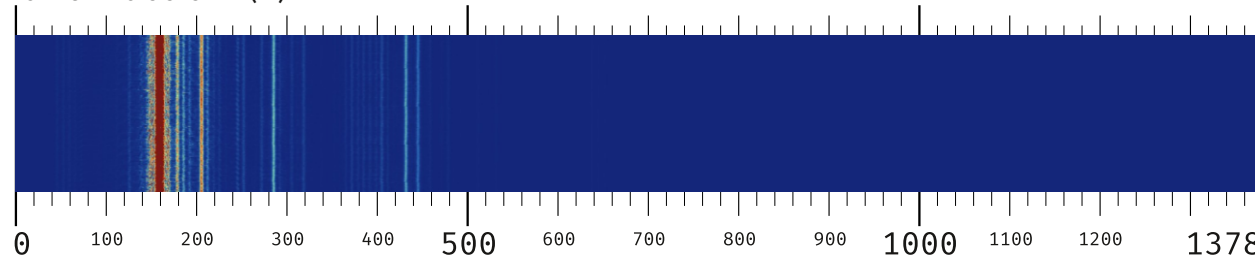
## MACHINERY

**ENGINE(S)**  
• Caterpillar 3512B DI-TA  
• Cycles: 4, Cylinders: 12  
• Power: 1 028 kW (1 400 shp)  
• CMP: Direct, Gear ratio: 4:1  
• Engine RPM: 1600

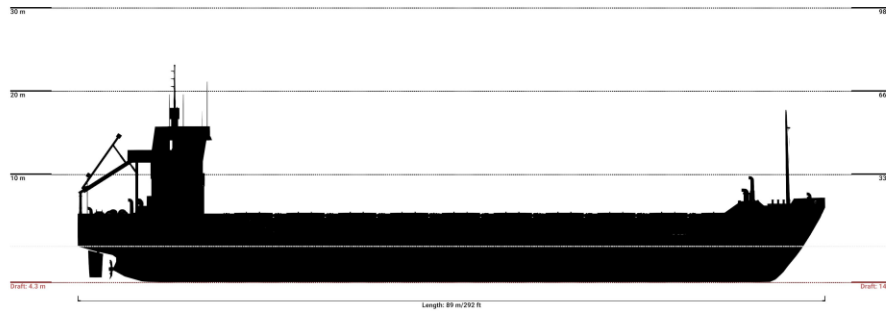
**SHAFT(S)**  
• #: 1  
• Blades: 4,  $\phi$ : 3.5 m  
• Shaft RPM: 400



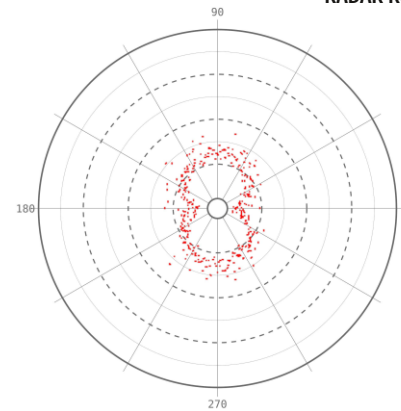
## LOFARGRAM CRUISE SPEED (Hz)



## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A small container ship (feeder) used for regional routes and short-sea shipping. Highly maneuverable with shallow draft, it connects smaller ports to major hubs.

### TYPE

- Container

### DIMENSIONS

- Length: 90.0 m
- Beam: 15.5 m
- Draft: 6.4 m
- Displacement: 4500.0 tons

### SPEEDS

- Max: 15.1 kts
- Cruise: 10.0 kts

## MACHINERY

### ENGINE(S)

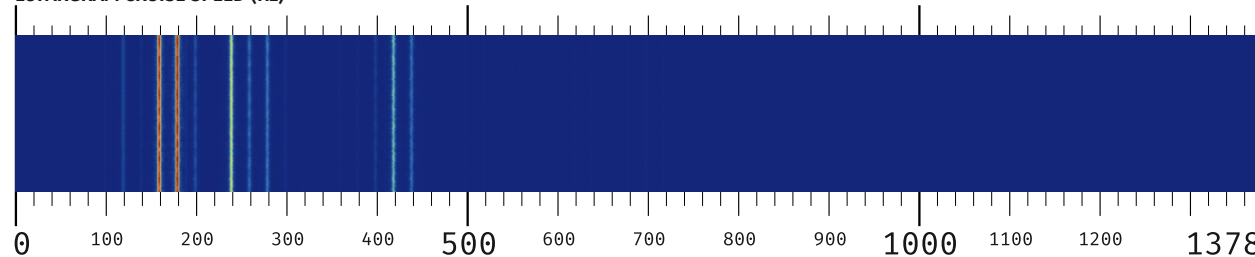
- Wärtsilä 6L32
- Cycles: 4, Cylinders: 6l
- Power: 3 600 kW (4 890 shp)
- CMP: Geared, Gear ratio: 3.75:1
- Engine RPM: 750

### SHAFT(S)

- #: 1
- Blades: 4,  $\phi$ : 3.5 m
- Shaft RPM: 200



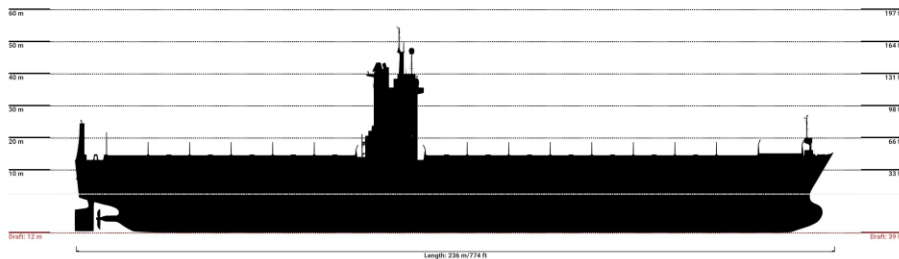
## LOFARGRAM CRUISE SPEED (Hz)



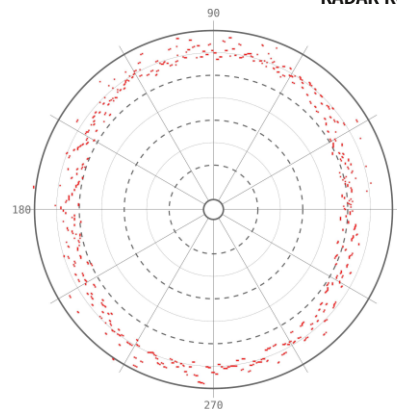
# ▶ Neo-Panamax Container Ship Jiansu 237 Class



## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A Neo-Panamax container ship designed to fit the expanded Panama Canal locks. Optimized for high-capacity intercontinental routes, it transports containers efficiently across global trade lanes.

**TYPE**  
• Container

**DIMENSIONS**  
• Length: 237.0 m  
• Beam: 41.0 m  
• Draft: 14.5 m  
• Displacement: 58000.0 tons

**SPEEDS**  
• Max: 21.0 kts  
• Cruise: 14.0 kts

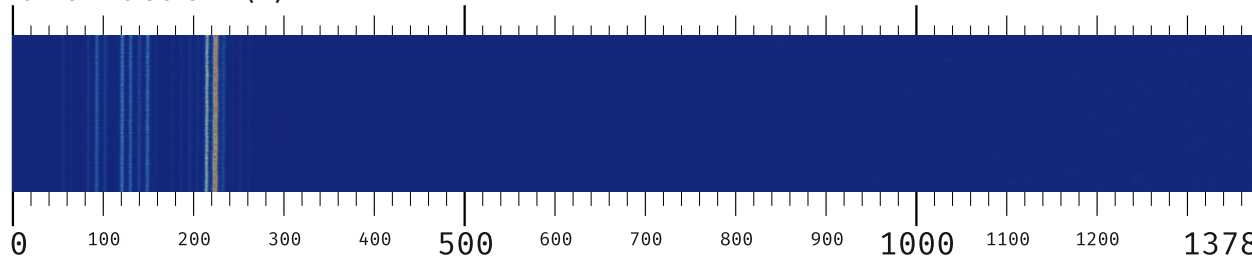
## MACHINERY

**ENGINE(S)**  
• MAN B&W 9L60MC-C  
• Cycles: 2, Cylinders: 9  
• Power: 19 500 kW (26 500 shp)  
• CMP: Direct, Gear ratio: 1:1  
• Engine RPM: 120

**SHAFT(S)**  
• #: 1  
• Blades: 4,  $\phi$ : 7.0 m  
• Shaft RPM: 120

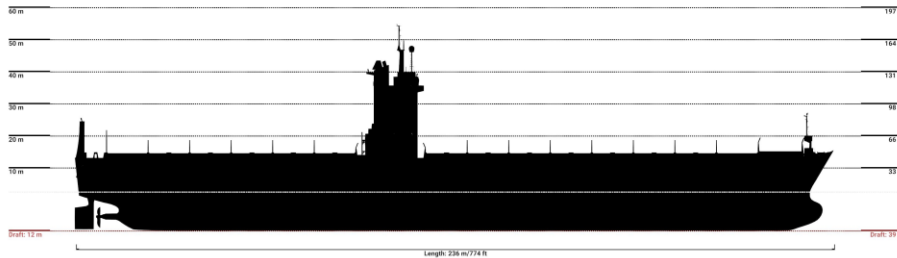


## LOFARGRAM CRUISE SPEED (Hz)

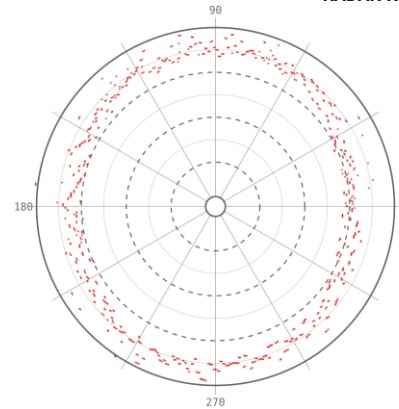




## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A Neo-Panamax container ship designed to fit the expanded Panama Canal locks. Optimized for high-capacity intercontinental routes, it transports containers efficiently across global trade lanes.

### TYPE

- Container

### DIMENSIONS

- Length: 240.0 m
- Beam: 41.0 m
- Draft: 14.6 m
- Displacement: 58500.0 tons

### SPEEDS

- Max: 21.2 kts
- Cruise: 14.4 kts

## MACHINERY

### ENGINE(S)

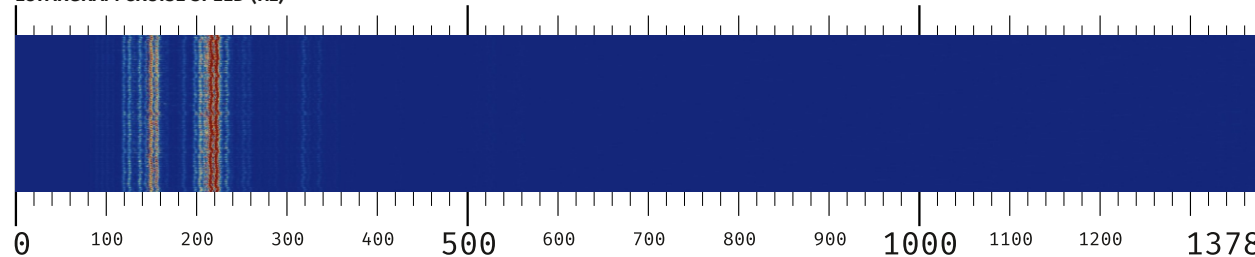
- Sulzer RTA96C
- Cycles: 2, Cylinders: 7
- Power: 28 000 kW (38 100 shp)
- CMP: Direct, Gear ratio: 1:1
- Engine RPM: 90

### SHAFT(S)

- #: 1
- Blades: 5,  $\phi$ : 8.5 m
- Shaft RPM: 90

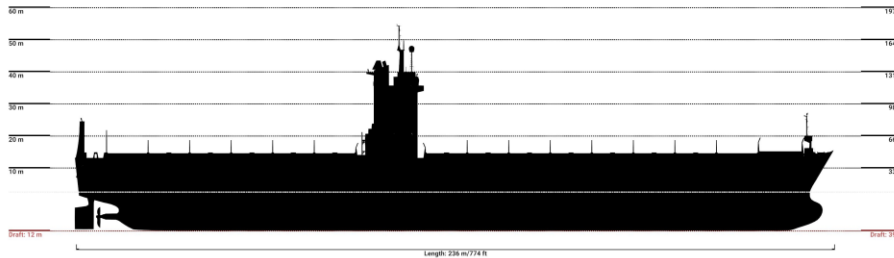


## LOFARGRAM CRUISE SPEED (Hz)

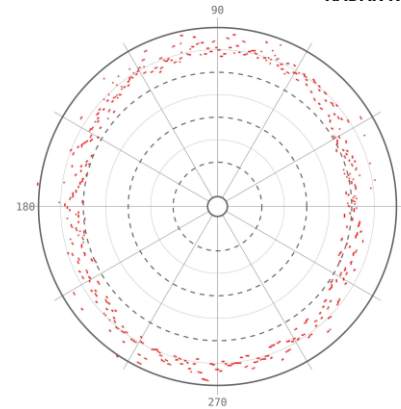


# ▶ Neo-Panamax Container Ship Hantao 238 Delta Class

## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A Neo-Panamax container ship designed to fit the expanded Panama Canal locks. Optimized for high-capacity intercontinental routes, it transports containers efficiently across global trade lanes.

### TYPE

- Container

### DIMENSIONS

- Length: 238.0 m
- Beam: 41.0 m
- Draft: 14.5 m
- Displacement: 58250.0 tons

### SPEEDS

- Max: 20.8 kts
- Cruise: 14.1 kts

## MACHINERY

### ENGINE(S)

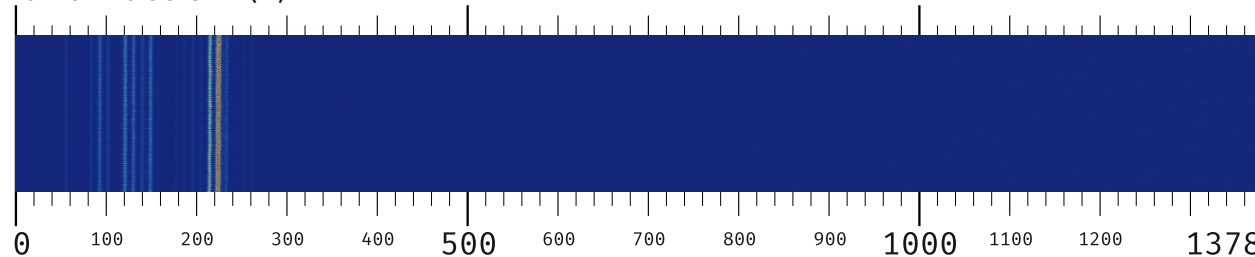
- MAN B&W 9L60MC-C
- Cycles: 2, Cylinders: 9
- Power: 19 500 kW (26 500 shp)
- CMP: Direct, Gear ratio: 1:1
- Engine RPM: 120

### SHAFT(S)

- #: 1
- Blades: 4,  $\phi$ : 7.0 m
- Shaft RPM: 120

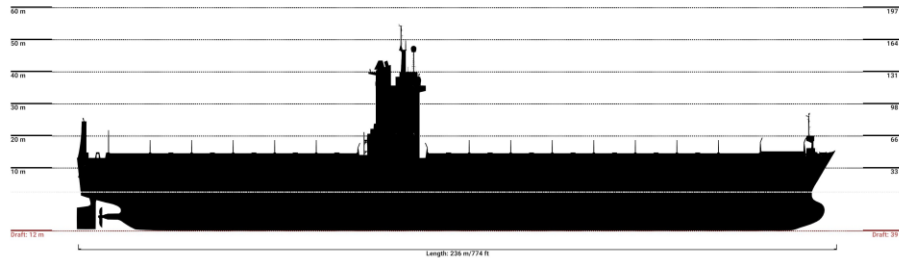


## LOFARGRAM CRUISE SPEED (Hz)

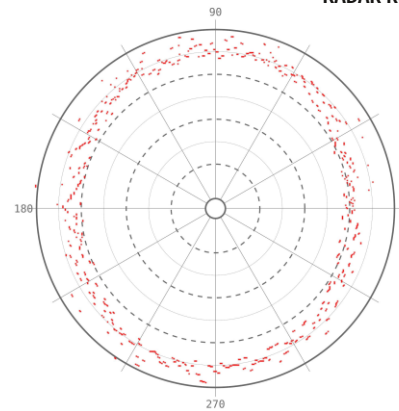




## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A Neo-Panamax container ship designed to fit the expanded Panama Canal locks. Optimized for high-capacity intercontinental routes, it transports containers efficiently across global trade lanes.

**TYPE**  
• Container

**DIMENSIONS**  
• Length: 239.0 m  
• Beam: 41.0 m  
• Draft: 14.6 m  
• Displacement: 58600.0 tons

**SPEEDS**  
• Max: 21.1 kts  
• Cruise: 13.9 kts

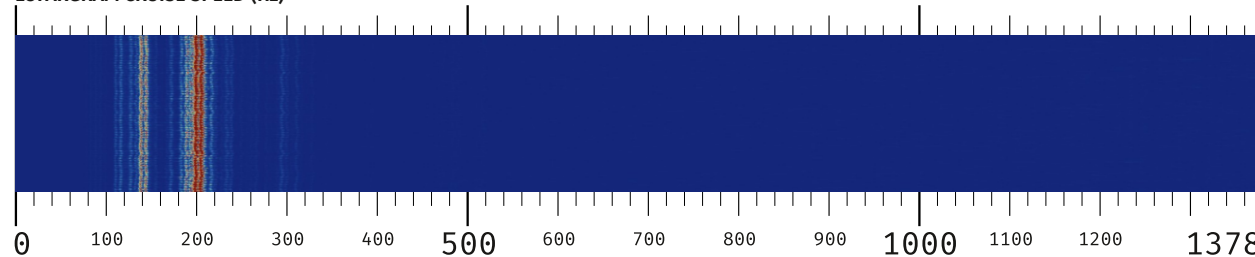
## MACHINERY

**ENGINE(S)**  
• Sulzer RTA96C  
• Cycles: 2, Cylinders: 7  
• Power: 28 000 kW (38 100 shp)  
• CMP: Direct, Gear ratio: 1:1  
• Engine RPM: 90

**SHAFT(S)**  
• #: 1  
• Blades: 4,  $\phi$ : 7.0 m  
• Shaft RPM: 90



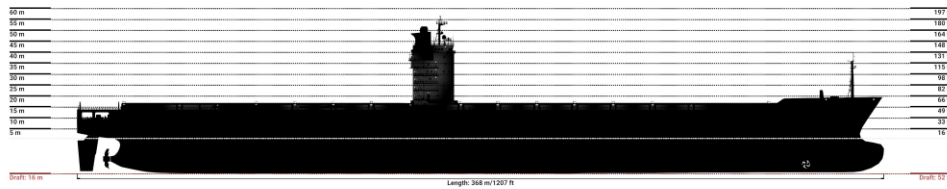
## LOFARGRAM CRUISE SPEED (Hz)



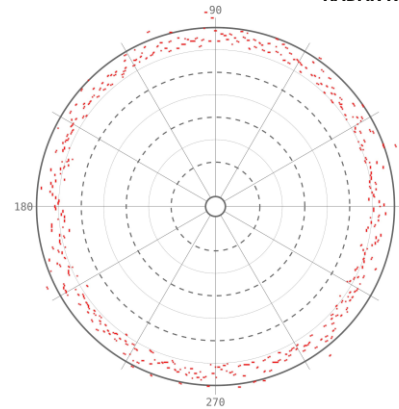
# ▶ ULCV Maritech 370 Class



## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

An Ultra Large Container Vessel (ULCV) is among the largest container ships in the world, capable of transporting over 20,000 TEU. These giants are designed for deep-water ports and high-volume intercontinental routes.

### TYPE

- Container

### DIMENSIONS

- Length: 370.0 m
- Beam: 56.5 m
- Draft: 16.0 m
- Displacement: 220000.0 tons

### SPEEDS

- Max: 23.0 kts
- Cruise: 15.2 kts

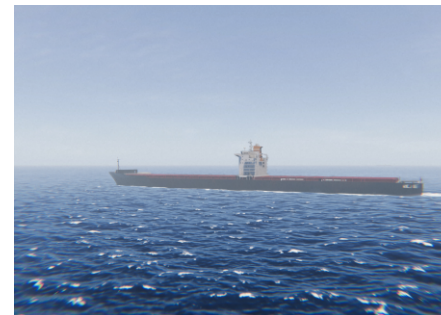
## MACHINERY

### ENGINE(S)

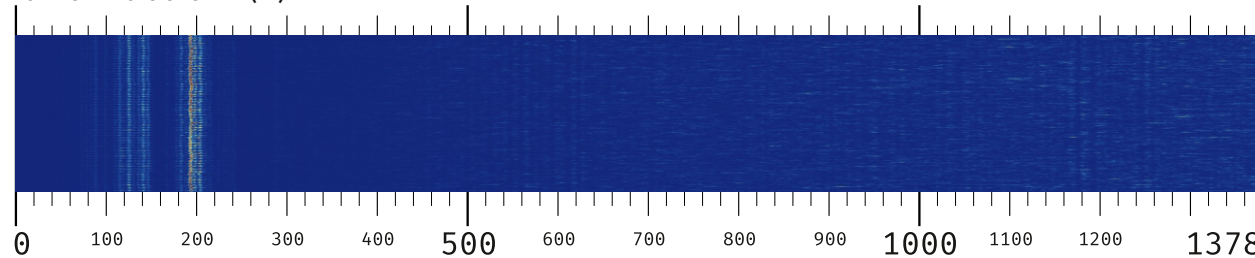
- MAN B&W 7S90ME-C10
- Cycles: 2, Cylinders: 7
- Power: 48 500 kW (65 900 shp)
- CMP: Direct, Gear ratio: 1:1
- Engine RPM: 85

### SHAFT(S)

- #: 1
- Blades: 5,  $\phi$ : 9.6 m
- Shaft RPM: 85



## LOFARGRAM CRUISE SPEED (Hz)

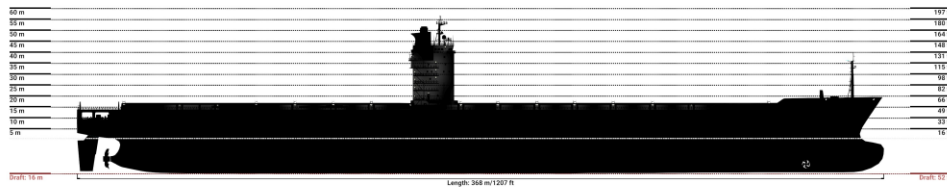




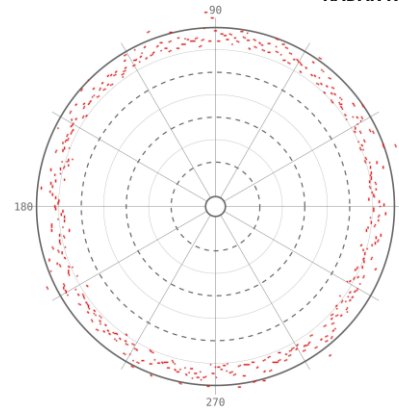
# ▶ ULCV Hantao 368 Eco Class



## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

An Ultra Large Container Vessel (ULCV) is among the largest container ships in the world, capable of transporting over 20,000 TEU. These giants are designed for deep-water ports and high-volume intercontinental routes.

### TYPE

- Container

### DIMENSIONS

- Length: 368.0 m
- Beam: 56.5 m
- Draft: 15.9 m
- Displacement: 218500.0 tons

### SPEEDS

- Max: 23.2 kts
- Cruise: 15.5 kts

## MACHINERY

### ENGINE(S)

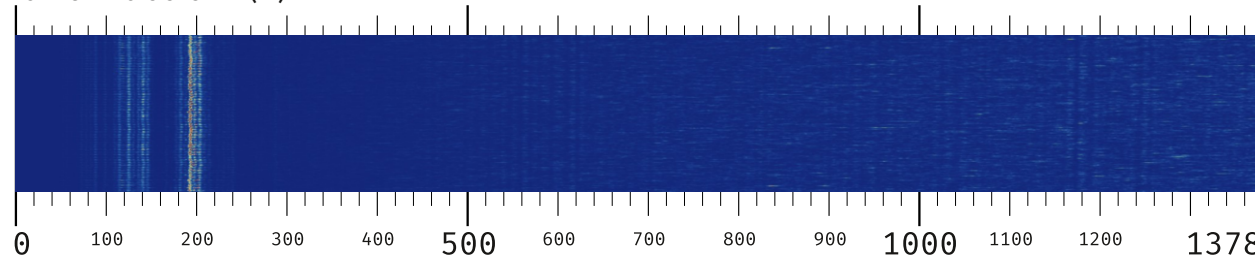
- MAN B&W 7S90ME-C10
- Cycles: 2, Cylinders: 7
- Power: 48 500 kW (65 900 shp)
- CMP: Direct, Gear ratio: 1:1
- Engine RPM: 85

### SHAFT(S)

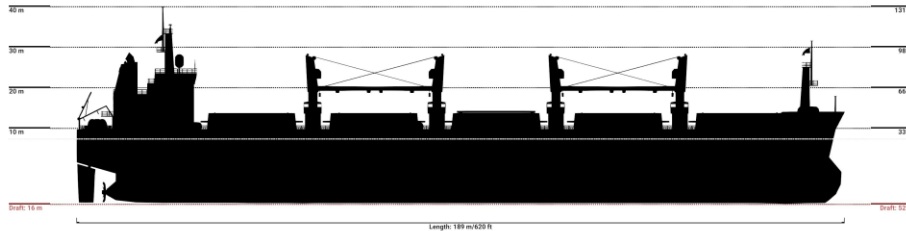
- #: 1
- Blades: 5,  $\phi$ : 9.6 m
- Shaft RPM: 85



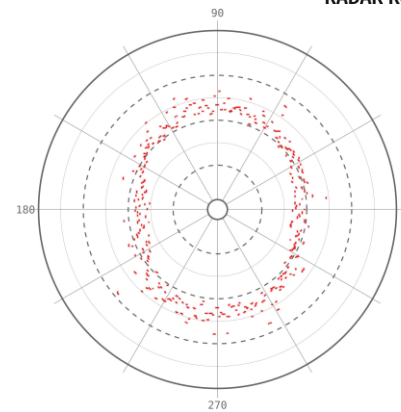
## LOFARGRAM CRUISE SPEED (Hz)



## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A small-to-medium bulk carrier typically in the 15,000–40,000 DWT range. Handysize bulkers are highly versatile, able to access smaller ports and transport a wide variety of dry cargo such as grain, coal, and steel products.

### TYPE

- Bulk Carrier

### DIMENSIONS

- Length: 189.0 m
- Beam: 33.0 m
- Draft: 16.0 m
- Displacement: 19250.0 tons

### SPEEDS

- Max: 14.0 kts
- Cruise: 11.2 kts

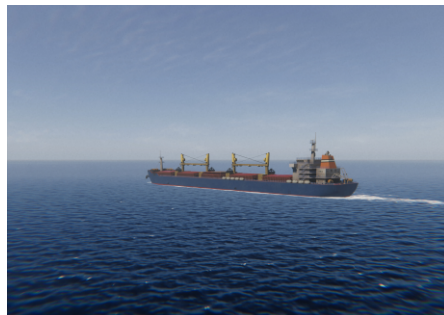
## MACHINERY

### ENGINE(S)

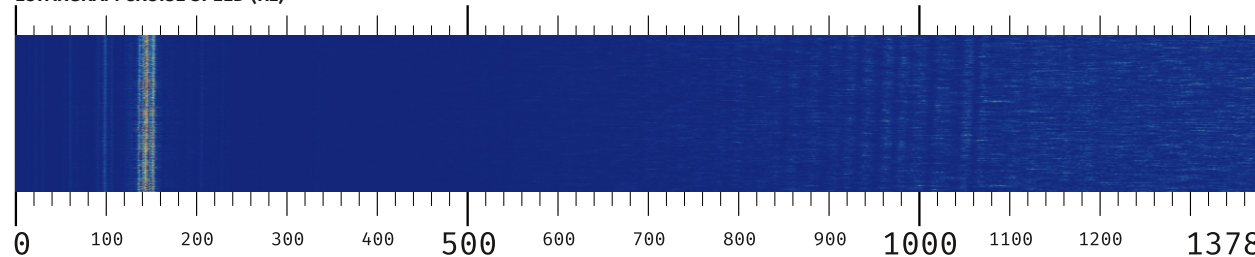
- MAN 6S35MC
- Cycles: 2, Cylinders: 6
- Power: 5 000 kW (6 800 shp)
- CMP: Direct, Gear ratio: 1:1
- Engine RPM: 100

### SHAFT(S)

- #: 1
- Blades: 4,  $\phi$ : 5.5 m
- Shaft RPM: 100

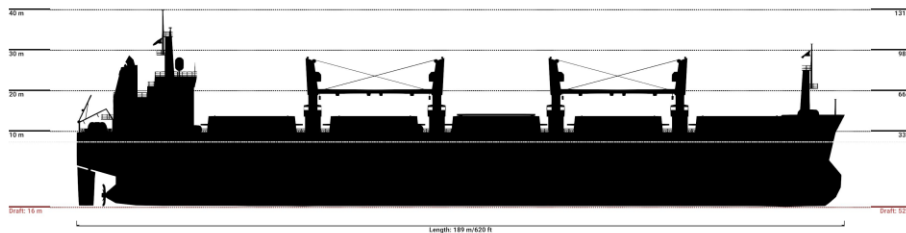


## LOFARGRAM CRUISE SPEED (Hz)

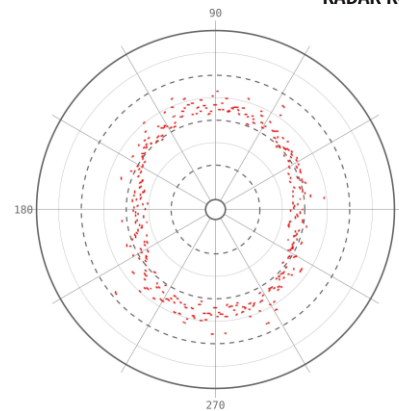


# ▶ Handysize Bulk Carrier Dolphix 38E Class

## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A small-to-medium bulk carrier typically in the 15,000–40,000 DWT range. Handysize bulkers are highly versatile, able to access smaller ports and transport a wide variety of dry cargo such as grain, coal, and steel products.

### TYPE

- Bulk Carrier

### DIMENSIONS

- Length: 189.0 m
- Beam: 33.1 m
- Draft: 16.0 m
- Displacement: 19255.0 tons

### SPEEDS

- Max: 14.1 kts
- Cruise: 11.3 kts

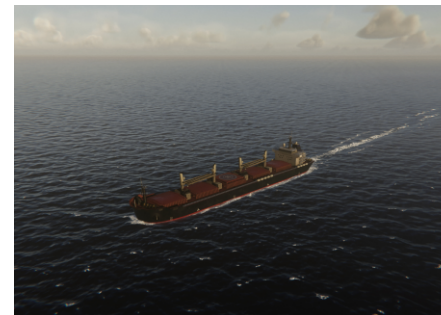
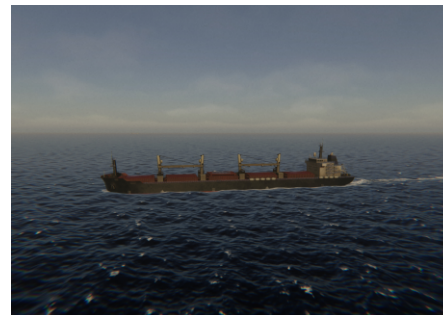
## MACHINERY

### ENGINE(S)

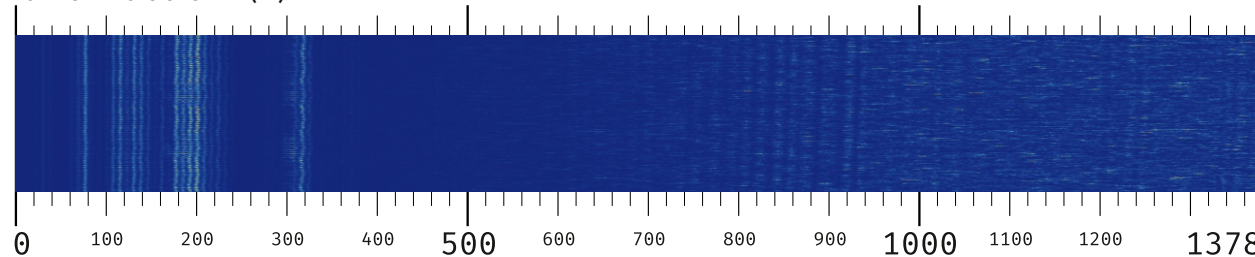
- MAN 7S35MC-C
- Cycles: 2, Cylinders: 7
- Power: 5 800 kW (7 890 shp)
- CMP: Direct, Gear ratio: 1:1
- Engine RPM: 95

### SHAFT(S)

- #: 1
- Blades: 4,  $\phi$ : 6.0 m
- Shaft RPM: 95

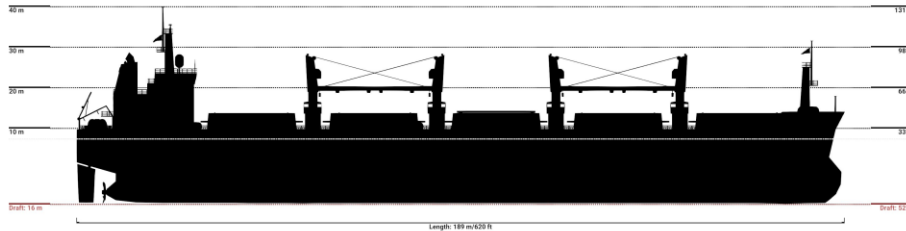


## LOFARGRAM CRUISE SPEED (Hz)

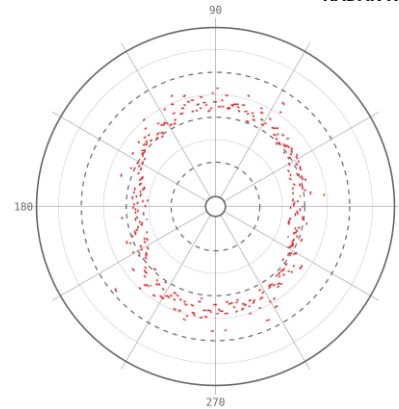




## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A small-to-medium bulk carrier typically in the 15,000–40,000 DWT range. Handysize bulkers are highly versatile, able to access smaller ports and transport a wide variety of dry cargo such as grain, coal, and steel products.

### TYPE

- Bulk Carrier

### DIMENSIONS

- Length: 190.0 m
- Beam: 33.0 m
- Draft: 16.0 m
- Displacement: 19260.0 tons

### SPEEDS

- Max: 14.3 kts
- Cruise: 11.1 kts

## MACHINERY

### ENGINE(S)

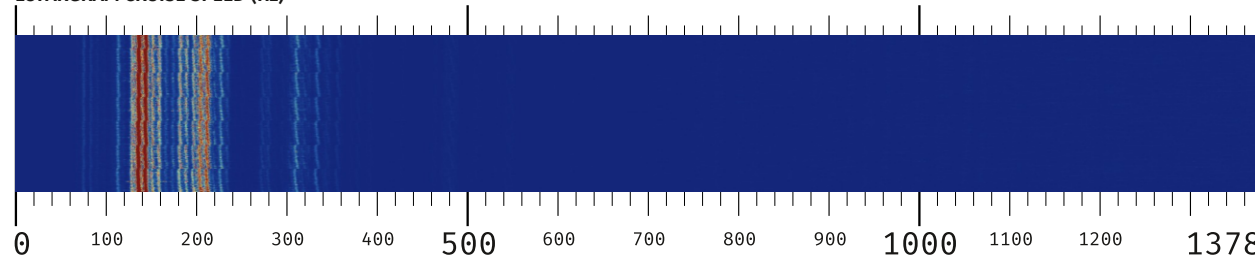
- MAN B&W 6S42MC
- Cycles: 2, Cylinders: 6
- Power: 5 300 kW (7 210 shp)
- CMP: Direct, Gear ratio: 1:1
- Engine RPM: 95

### SHAFT(S)

- #: 1
- Blades: 5,  $\phi$ : 5.5 m
- Shaft RPM: 95

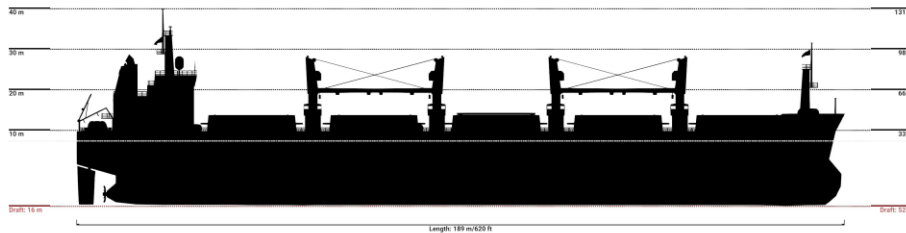


## LOFARGRAM CRUISE SPEED (Hz)

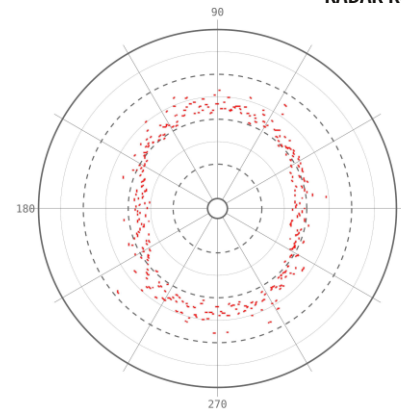


# ▶ Handysize Bulk Carrier Hakodai 34 Plus Class

## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A small-to-medium bulk carrier typically in the 15,000–40,000 DWT range. Handysize bulkers are highly versatile, able to access smaller ports and transport a wide variety of dry cargo such as grain, coal, and steel products.

### TYPE

- Bulk Carrier

### DIMENSIONS

- Length: 188.0 m
- Beam: 33.0 m
- Draft: 16.1 m
- Displacement: 19200.0 tons

### SPEEDS

- Max: 14.0 kts
- Cruise: 11.0 kts

## MACHINERY

### ENGINE(S)

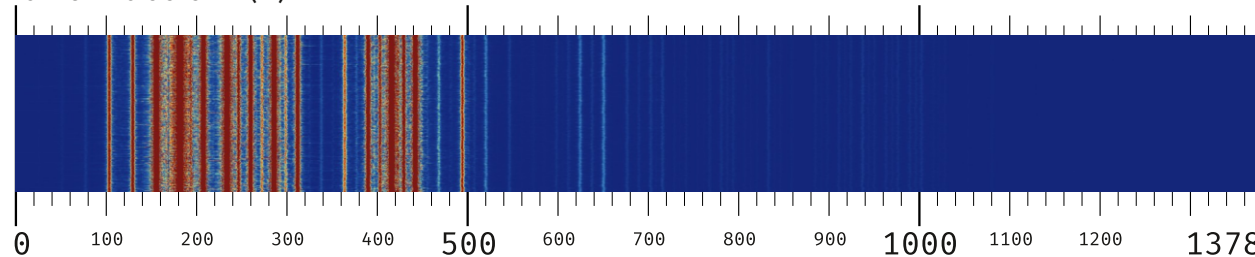
- Wärtsilä 8L32
- Cycles: 4, Cylinders: 81
- Power: 4 500 kW (6 120 shp)
- CMP: Geared, Gear ratio: 6:1
- Engine RPM: 750

### SHAFT(S)

- #: 1
- Blades: 4,  $\phi$ : 4.5 m
- Shaft RPM: 125

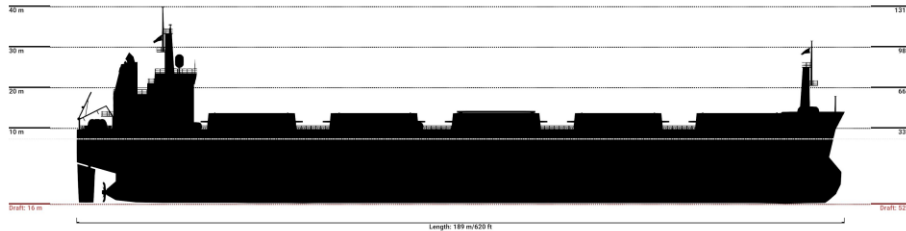


## LOFARGRAM CRUISE SPEED (Hz)

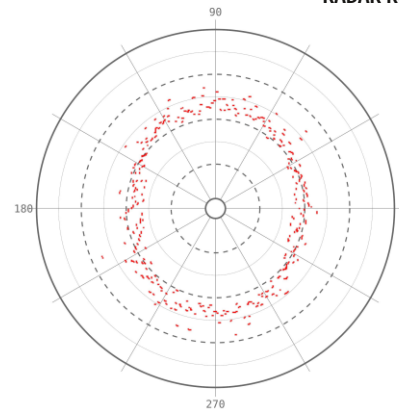




## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A small-to-medium bulk carrier typically in the 15,000–40,000 DWT range. Handysize bulkers are highly versatile, able to access smaller ports and transport a wide variety of dry cargo such as grain, coal, and steel products.

### TYPE

- Bulk Carrier

### DIMENSIONS

- Length: 190.0 m
- Beam: 34.0 m
- Draft: 16.0 m
- Displacement: 19300.0 tons

### SPEEDS

- Max: 14.1 kts
- Cruise: 11.3 kts

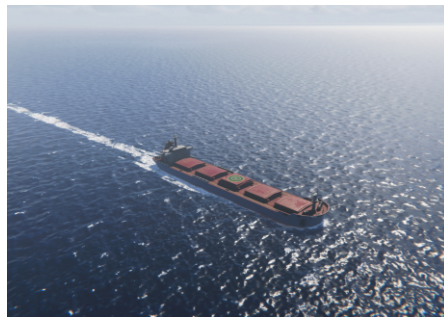
## MACHINERY

### ENGINE(S)

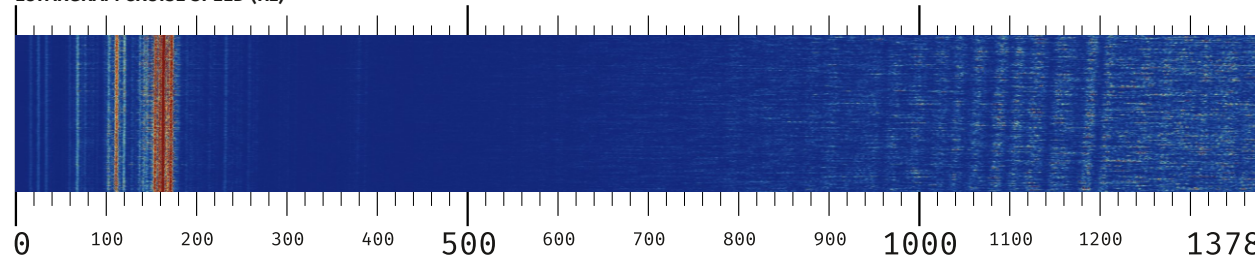
- MAN 6S35MC
- Cycles: 2, Cylinders: 6
- Power: 5 000 kW (6 800 shp)
- CMP: Direct, Gear ratio: 1:1
- Engine RPM: 100

### SHAFT(S)

- #: 1
- Blades: 4,  $\phi$ : 5.5 m
- Shaft RPM: 100

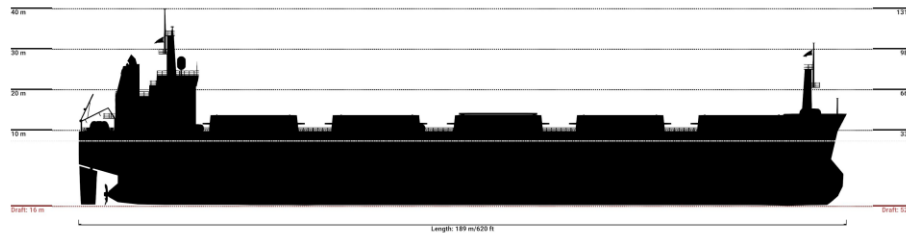


## LOFARGRAM CRUISE SPEED (Hz)

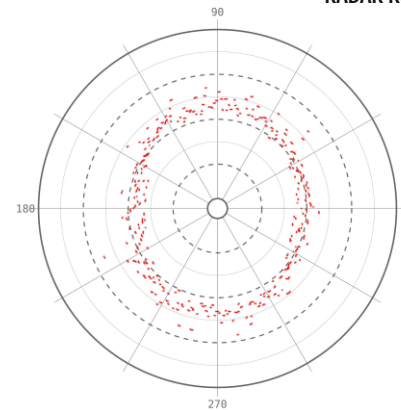




## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A small-to-medium bulk carrier typically in the 15,000–40,000 DWT range. Handysize bulkers are highly versatile, able to access smaller ports and transport a wide variety of dry cargo such as grain, coal, and steel products.

### TYPE

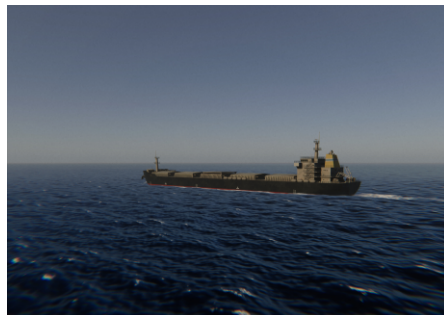
- Bulk Carrier

### DIMENSIONS

- Length: 188.0 m
- Beam: 33.1 m
- Draft: 16.0 m
- Displacement: 19205.0 tons

### SPEEDS

- Max: 14.1 kts
- Cruise: 11.0 kts



## MACHINERY

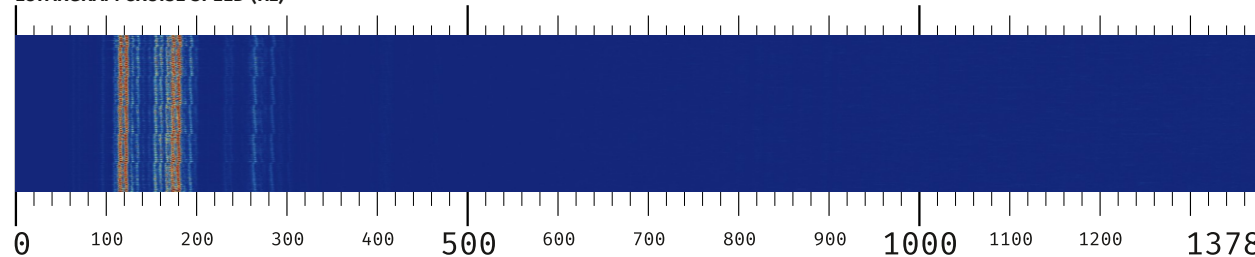
### ENGINE(S)

- MAN B&W 6S42MC
- Cycles: 2, Cylinders: 6
- Power: 5 300 kW (7 210 shp)
- CMP: Direct, Gear ratio: 1:1
- Engine RPM: 95

### SHAFT(S)

- #: 1
- Blades: 5,  $\phi$ : 5.5 m
- Shaft RPM: 95

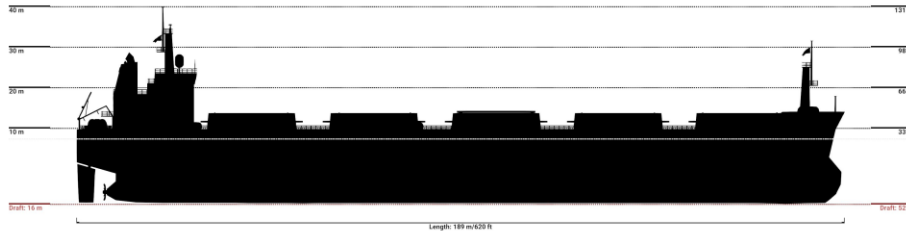
## LOFARGRAM CRUISE SPEED (Hz)



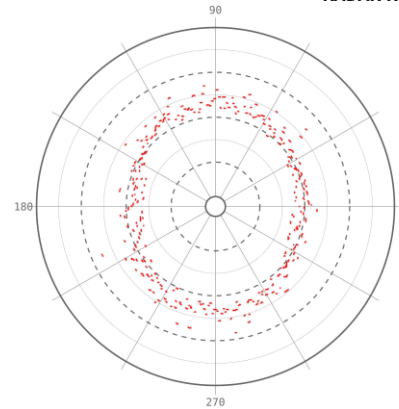
# ▶ Handysize Bulk Carrier Hantao 38 Class



## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A small-to-medium bulk carrier typically in the 15,000–40,000 DWT range. Handysize bulkers are highly versatile, able to access smaller ports and transport a wide variety of dry cargo such as grain, coal, and steel products.

### TYPE

- Bulk Carrier

### DIMENSIONS

- Length: 189.0 m
- Beam: 33.0 m
- Draft: 16.0 m
- Displacement: 19250.0 tons

### SPEEDS

- Max: 14.0 kts
- Cruise: 11.2 kts

## MACHINERY

### ENGINE(S)

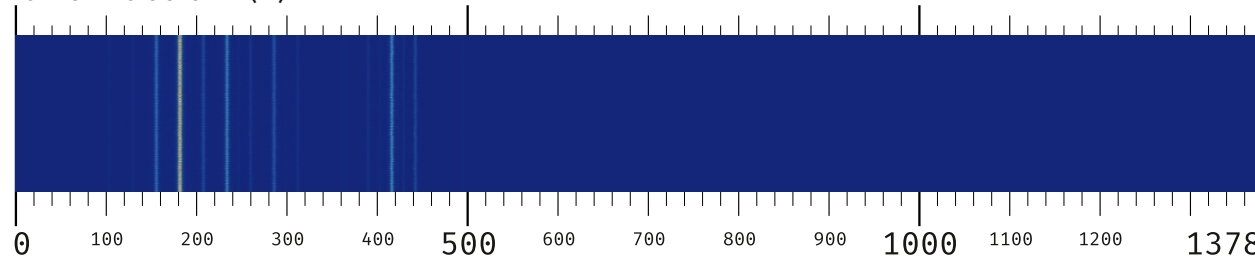
- Wärtsilä 8L32
- Cycles: 4, Cylinders: 81
- Power: 4 500 kW (6 120 shp)
- CMP: Geared, Gear ratio: 6:1
- Engine RPM: 750

### SHAFT(S)

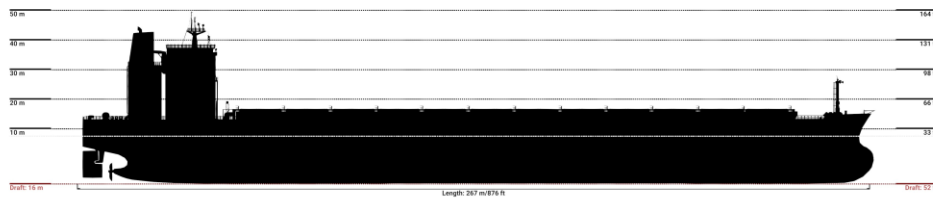
- #: 1
- Blades: 4,  $\phi$ : 4.5 m
- Shaft RPM: 125



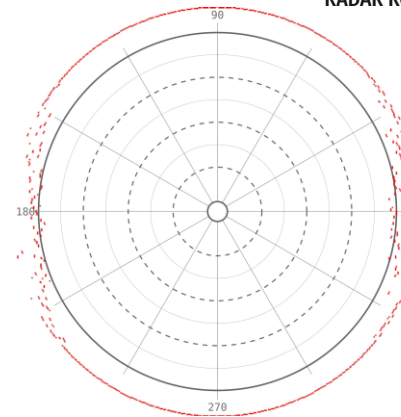
## LOFARGRAM CRUISE SPEED (Hz)



## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A large bulk carrier designed to fit the expanded Panama Canal locks. Neo-Panamax bulkers combine high cargo capacity with global routing flexibility, making them ideal for major commodity trades such as coal, iron ore, and grain.

### TYPE

- Bulk Carrier

### DIMENSIONS

- Length: 267.0 m
- Beam: 51.5 m
- Draft: 16.0 m
- Displacement: 120000.0 tons

### SPEEDS

- Max: 16.0 kts
- Cruise: 12.8 kts

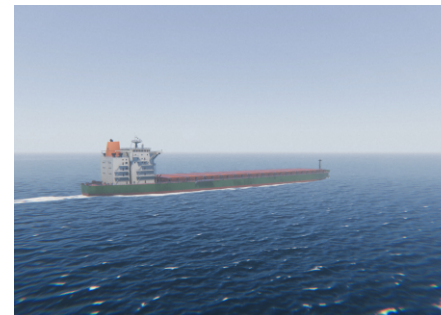
## MACHINERY

### ENGINE(S)

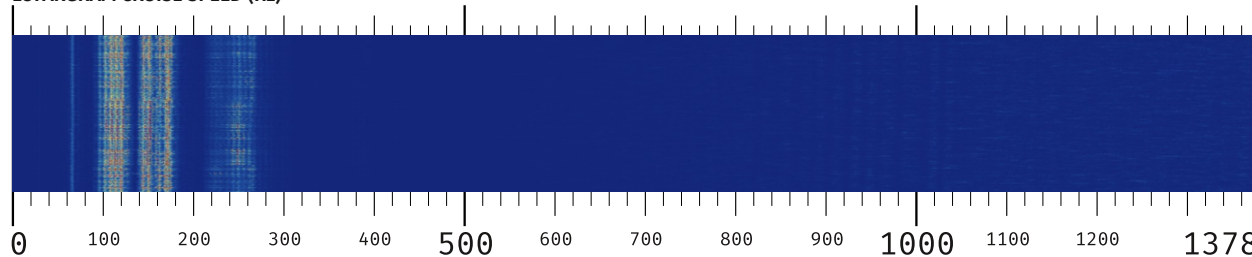
- MAN B&W 5S42MC
- Cycles: 2, Cylinders: 6
- Power: 6 200 kW (8 430 shp)
- CMP: Direct, Gear ratio: 1:1
- Engine RPM: 95

### SHAFT(S)

- #: 1
- Blades: 4,  $\phi$ : 6.4 m
- Shaft RPM: 95

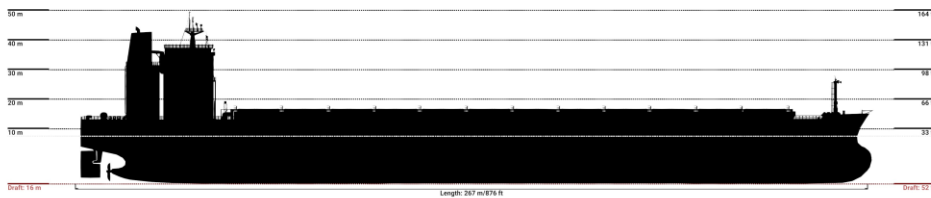


## LOFARGRAM CRUISE SPEED (Hz)

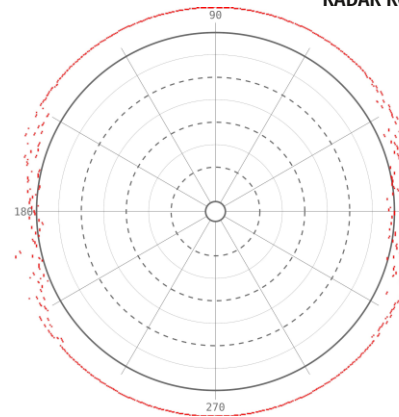


# ▶ Neo-Panamax Bulk Carrier Dolphix 81X Neo Class

## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A large bulk carrier designed to fit the expanded Panama Canal locks. Neo-Panamax bulkers combine high cargo capacity with global routing flexibility, making them ideal for major commodity trades such as coal, iron ore, and grain.

**TYPE**  
• Bulk Carrier

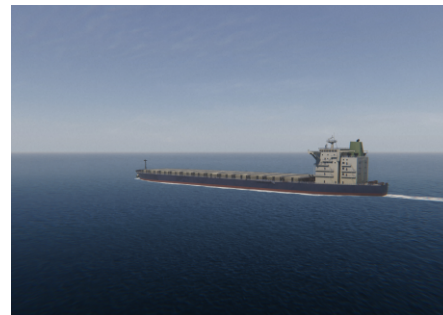
**DIMENSIONS**  
• Length: 267.0 m  
• Beam: 51.5 m  
• Draft: 16.0 m  
• Displacement: 120010.0 tons

**SPEEDS**  
• Max: 16.6 kts  
• Cruise: 13.4 kts

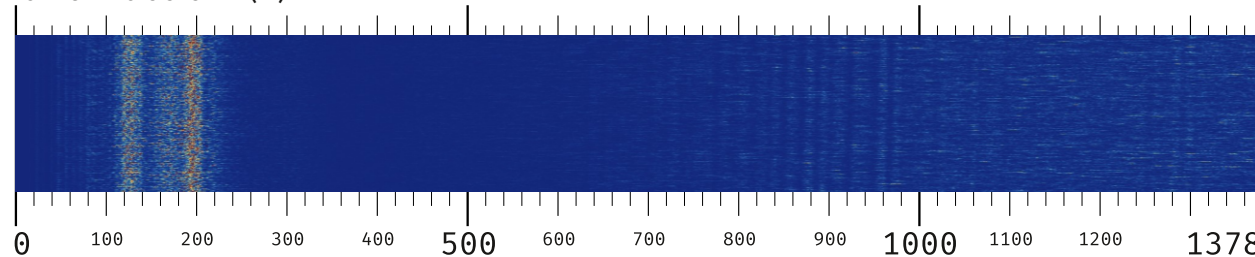
## MACHINERY

**ENGINE(S)**  
• MAN 7S50MC-C  
• Cycles: 2, Cylinders: 7  
• Power: 7 000 kW (9 520 shp)  
• CMP: Direct, Gear ratio: 1:1  
• Engine RPM: 95

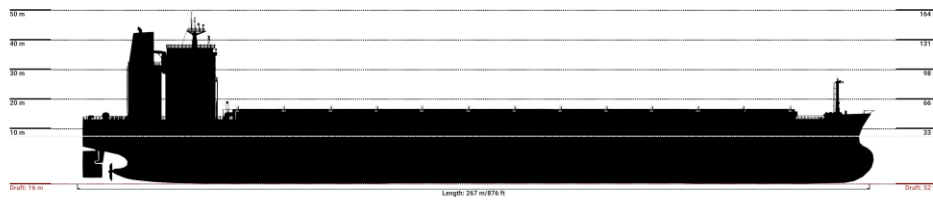
**SHAFT(S)**  
• #: 1  
• Blades: 4,  $\phi$ : 6.6 m  
• Shaft RPM: 95



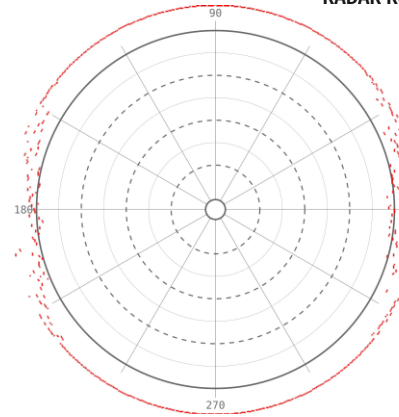
## LOFARGRAM CRUISE SPEED (Hz)



## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A large bulk carrier designed to fit the expanded Panama Canal locks. Neo-Panamax bulkers combine high cargo capacity with global routing flexibility, making them ideal for major commodity trades such as coal, iron ore, and grain.

### TYPE

- Bulk Carrier

### DIMENSIONS

- Length: 268.0 m
- Beam: 51.5 m
- Draft: 16.0 m
- Displacement: 121000.0 tons

### SPEEDS

- Max: 16.2 kts
- Cruise: 12.9 kts

## MACHINERY

### ENGINE(S)

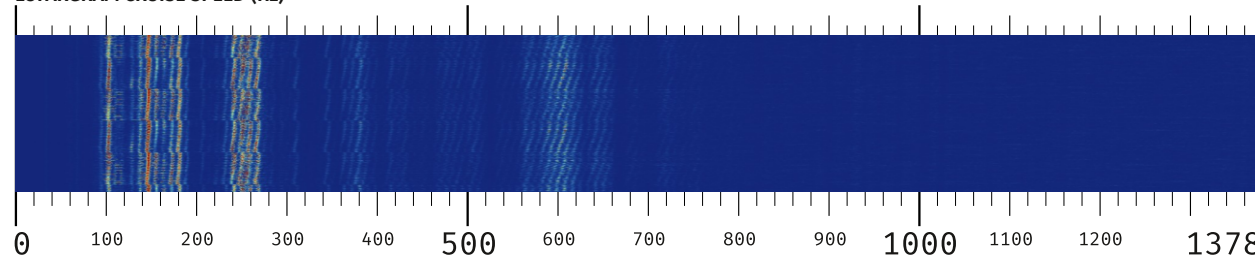
- Wärtsilä\_RT-flex50
- Cycles: 2, Cylinders: 6
- Power: 6 400 kW (8 700 shp)
- CMP: Direct, Gear ratio: 1:1
- Engine RPM: 95

### SHAFT(S)

- #: 1
- Blades: 5,  $\phi$ : 5.5 m
- Shaft RPM: 95

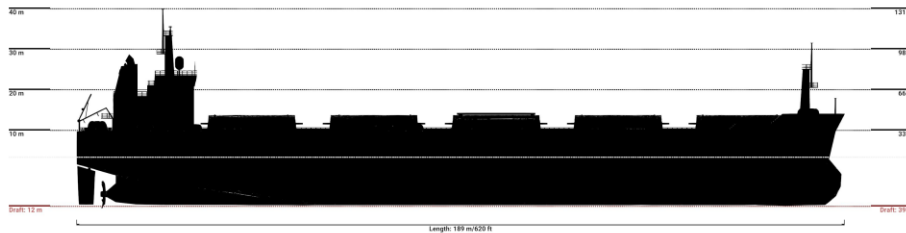


## LOFARGRAM CRUISE SPEED (Hz)

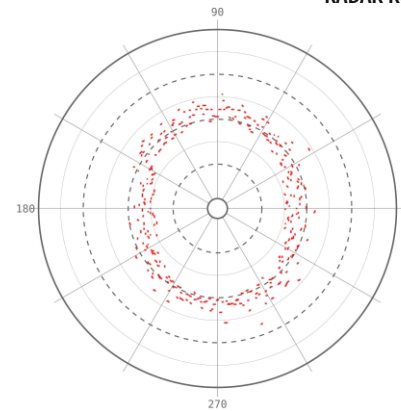


# ▶ Handysize OBO Carrier SDARCO Green 38 Design

## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A flexible combination carrier capable of transporting both dry bulk cargo and liquid cargoes such as oil. Handysize OBO vessels are optimized to reduce empty return voyages on mixed trade routes.

**TYPE**  
• Tanker

**DIMENSIONS**  
• Length: 189.0 m  
• Beam: 33.0 m  
• Draft: 12.0 m  
• Displacement: 15100.0 tons

**SPEEDS**  
• Max: 14.0 kts  
• Cruise: 11.0 kts

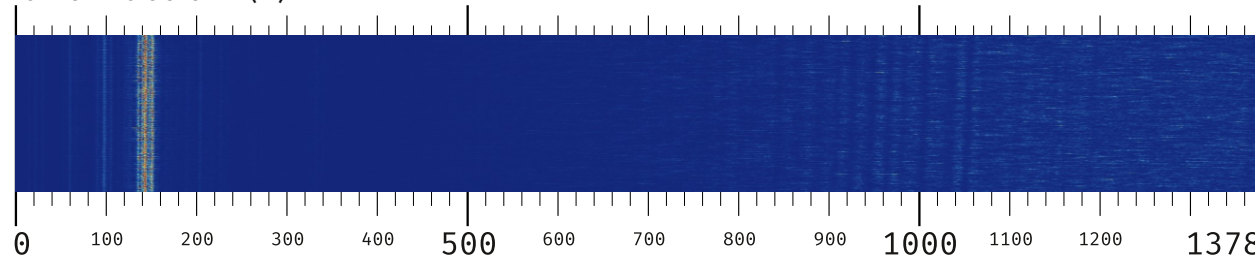
## MACHINERY

**ENGINE(S)**  
• MAN 6S35MC  
• Cycles: 2, Cylinders: 6  
• Power: 5 000 kW (6 800 shp)  
• CMP: Direct, Gear ratio: 1:1  
• Engine RPM: 100

**SHAFT(S)**  
• #: 1  
• Blades: 4,  $\phi$ : 5.5 m  
• Shaft RPM: 100

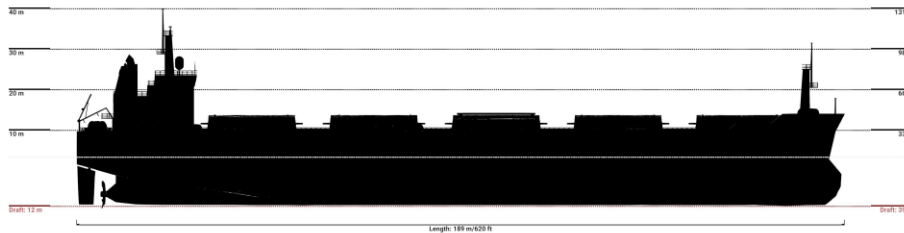


## LOFARGRAM CRUISE SPEED (Hz)

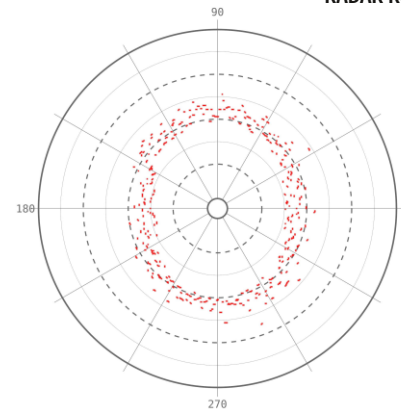




## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A flexible combination carrier capable of transporting both dry bulk cargo and liquid cargoes such as oil. Handysize OBO vessels are optimized to reduce empty return voyages on mixed trade routes.

**TYPE**  
• Tanker

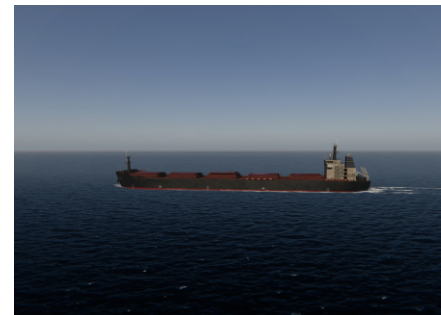
**DIMENSIONS**  
• Length: 189.0 m  
• Beam: 33.1 m  
• Draft: 12.0 m  
• Displacement: 15105.0 tons

**SPEEDS**  
• Max: 14.1 kts  
• Cruise: 11.2 kts

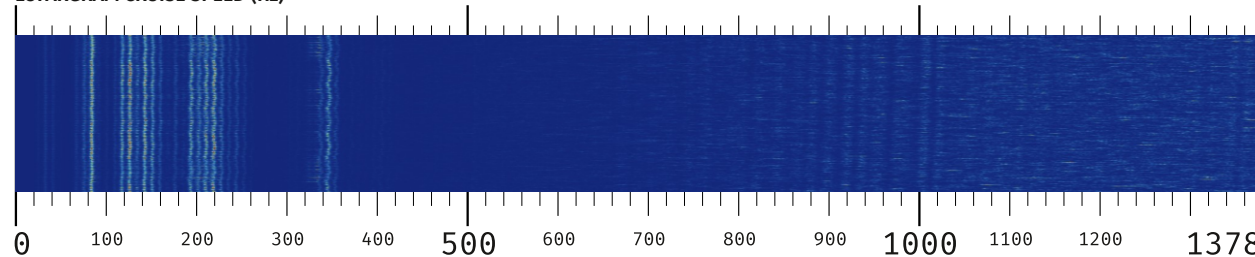
## MACHINERY

**ENGINE(S)**  
• MAN 7S35MC-C  
• Cycles: 2, Cylinders: 7  
• Power: 5 800 kW (7 890 shp)  
• CMP: Direct, Gear ratio: 1:1  
• Engine RPM: 95

**SHAFT(S)**  
• #: 1  
• Blades: 4,  $\phi$ : 6.0 m  
• Shaft RPM: 95



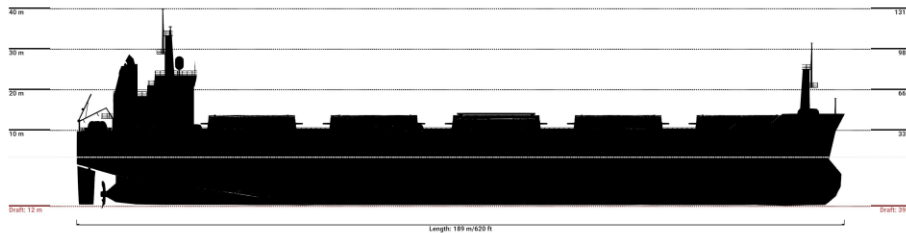
## LOFARGRAM CRUISE SPEED (Hz)



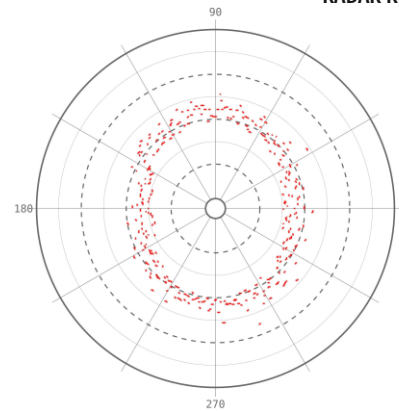
# ▶ Handysize OBO Carrier B.Deltis 37 Eco Class



## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A flexible combination carrier capable of transporting both dry bulk cargo and liquid cargoes such as oil. Handysize OBO vessels are optimized to reduce empty return voyages on mixed trade routes.

**TYPE**  
• Tanker

**DIMENSIONS**  
• Length: 188.0 m  
• Beam: 33.0 m  
• Draft: 12.0 m  
• Displacement: 15050.0 tons

**SPEEDS**  
• Max: 14.0 kts  
• Cruise: 11.1 kts

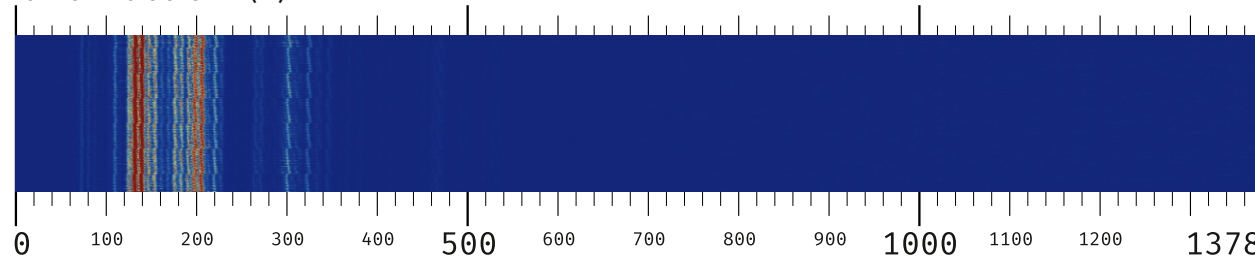
## MACHINERY

**ENGINE(S)**  
• MAN B&W 6S42MC  
• Cycles: 2, Cylinders: 6  
• Power: 5 300 kW (7 210 shp)  
• CMP: Direct, Gear ratio: 1:1  
• Engine RPM: 95

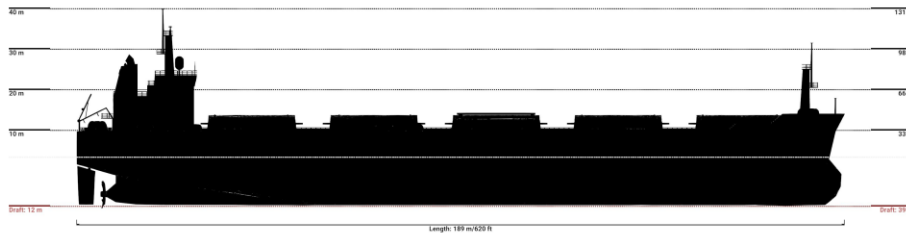
**SHAFT(S)**  
• #: 1  
• Blades: 5,  $\phi$ : 5.5 m  
• Shaft RPM: 95



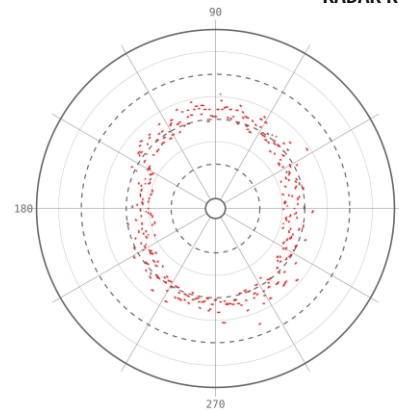
## LOFARGRAM CRUISE SPEED (Hz)



## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A flexible combination carrier capable of transporting both dry bulk cargo and liquid cargoes such as oil. Handysize OBO vessels are optimized to reduce empty return voyages on mixed trade routes.

**TYPE**  
• Tanker

**DIMENSIONS**  
• Length: 189.0 m  
• Beam: 33.1 m  
• Draft: 12.1 m  
• Displacement: 15110.0 tons

**SPEEDS**  
• Max: 14.0 kts  
• Cruise: 11.3 kts

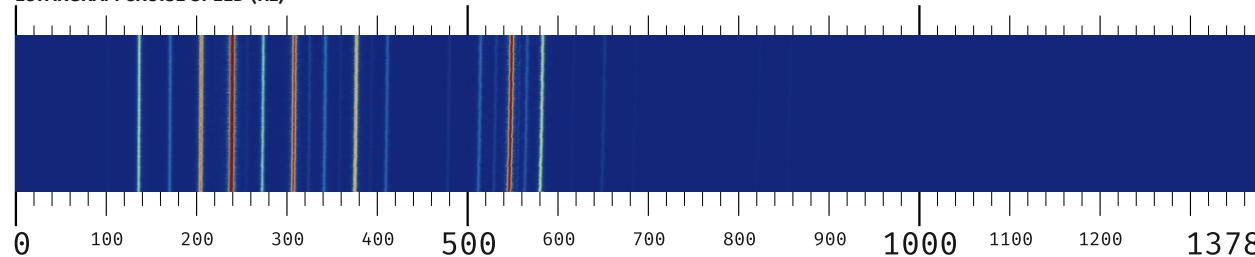
## MACHINERY

**ENGINE(S)**  
• Wärtsilä 8L32  
• Cycles: 4, Cylinders: 81  
• Power: 4 500 kW (6 120 shp)  
• CMP: Geared, Gear ratio: 6:1  
• Engine RPM: 750

**SHAFT(S)**  
• #: 1  
• Blades: 4,  $\phi$ : 4.5 m  
• Shaft RPM: 125



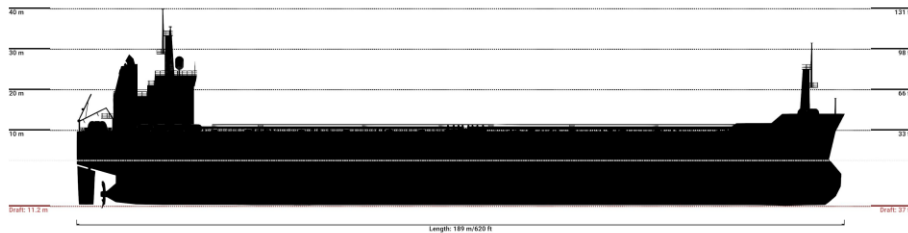
## LOFARGRAM CRUISE SPEED (Hz)



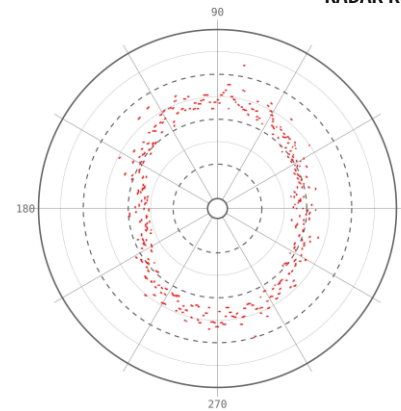
# ▶ Handysize Tanker B.Deltis 39 Eco Tanker Class



## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A small product tanker typically used for regional transport of refined petroleum products, chemicals, or vegetable oils. Handysize tankers are valued for their port accessibility and operational flexibility.

**TYPE**  
• Tanker

**DIMENSIONS**  
• Length: 188.0 m  
• Beam: 33.0 m  
• Draft: 13.0 m  
• Displacement: 16350.0 tons

**SPEEDS**  
• Max: 13.5 kts  
• Cruise: 11.5 kts

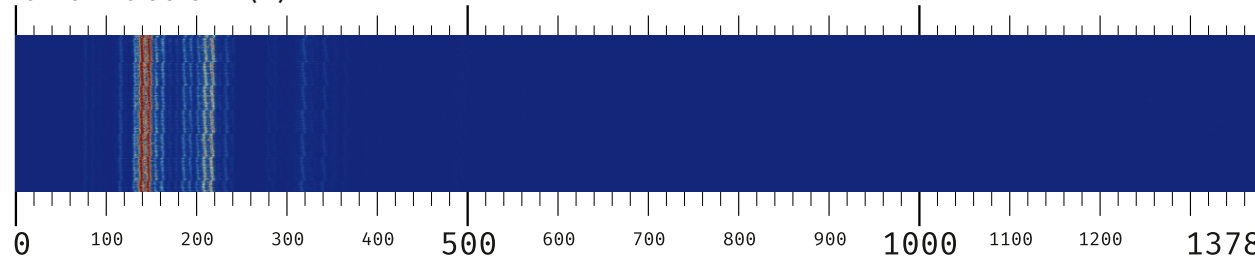
## MACHINERY

**ENGINE(S)**  
• MAN B&W 6S42MC  
• Cycles: 2, Cylinders: 6  
• Power: 7 200 kW (9 790 shp)  
• CMP: Direct, Gear ratio: 1:1  
• Engine RPM: 100

**SHAFT(S)**  
• #: 1  
• Blades: 4,  $\phi$ : 5.6 m  
• Shaft RPM: 100

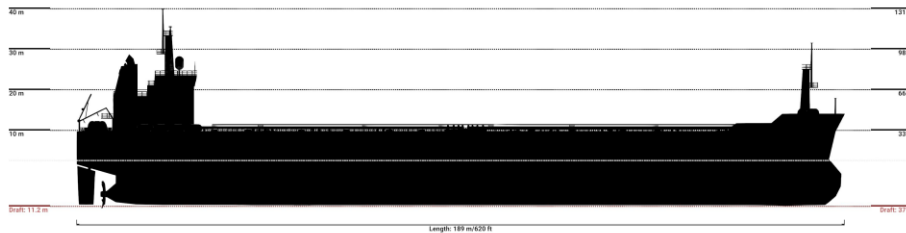


## LOFARGRAM CRUISE SPEED (Hz)

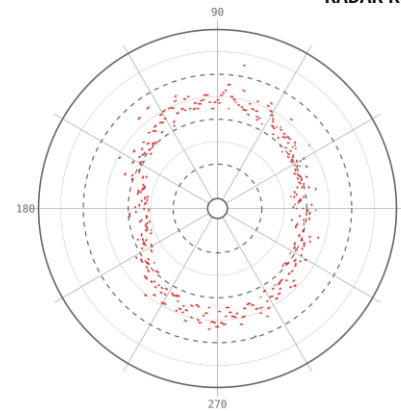




## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A small product tanker typically used for regional transport of refined petroleum products, chemicals, or vegetable oils. Handysize tankers are valued for their port accessibility and operational flexibility.

### TYPE

- Tanker

### DIMENSIONS

- Length: 189.0 m
- Beam: 33.1 m
- Draft: 13.0 m
- Displacement: 16730.0 tons

### SPEEDS

- Max: 12.5 kts
- Cruise: 10.6 kts

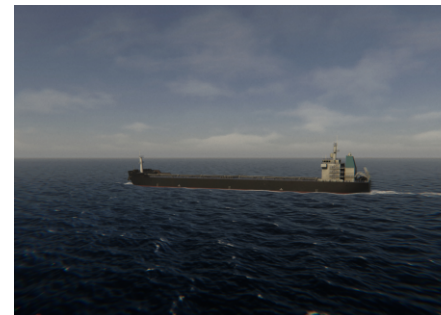
## MACHINERY

### ENGINE(S)

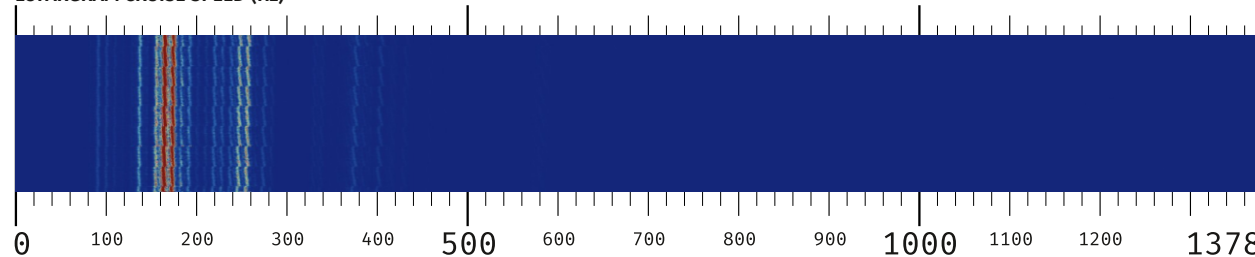
- MAN B&W 5S42MC
- Cycles: 2, Cylinders: 5
- Power: 6 000 kW (8 160 shp)
- CMP: Direct, Gear ratio: 1:1
- Engine RPM: 120

### SHAFT(S)

- #: 1
- Blades: 4,  $\phi$ : 5.4 m
- Shaft RPM: 125



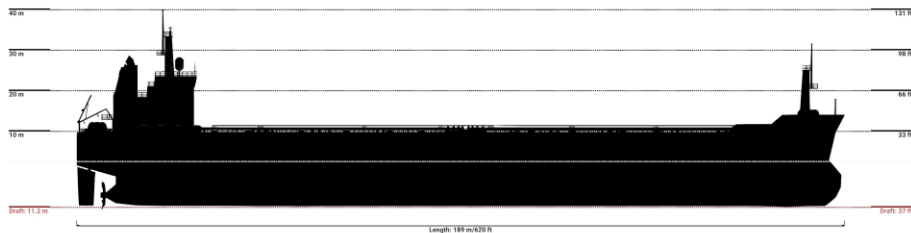
## LOFARGRAM CRUISE SPEED (Hz)



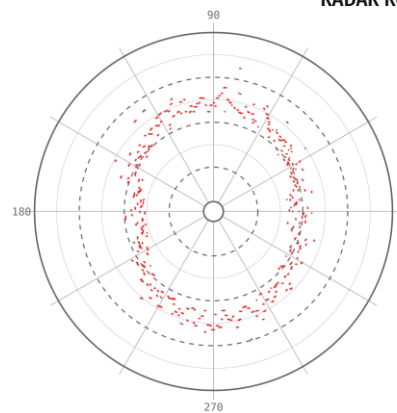
# ▶ Handysize Tanker Dolphix 37X IMO II Class



## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A small product tanker typically used for regional transport of refined petroleum products, chemicals, or vegetable oils. Handysize tankers are valued for their port accessibility and operational flexibility.

**TYPE**  
• Tanker

**DIMENSIONS**  
• Length: 190.0 m  
• Beam: 32.5 m  
• Draft: 13.0 m  
• Displacement: 16960.0 tons

**SPEEDS**  
• Max: 14.0 kts  
• Cruise: 12.1 kts

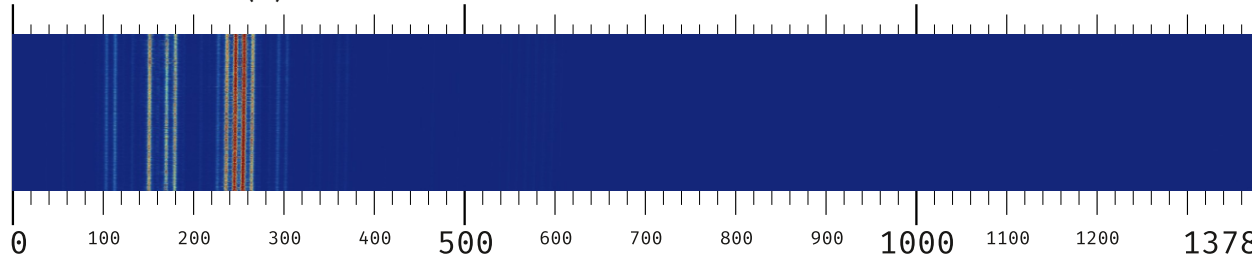
## MACHINERY

**ENGINE(S)**  
• Sulzer 6RTA48  
• Cycles: 2, Cylinders: 6  
• Power: 7 800 kW (10 600 shp)  
• CMP: Direct, Gear ratio: 1:1  
• Engine RPM: 130

**SHAFT(S)**  
• #: 1  
• Blades: 4,  $\phi$ : 5.2 m  
• Shaft RPM: 130

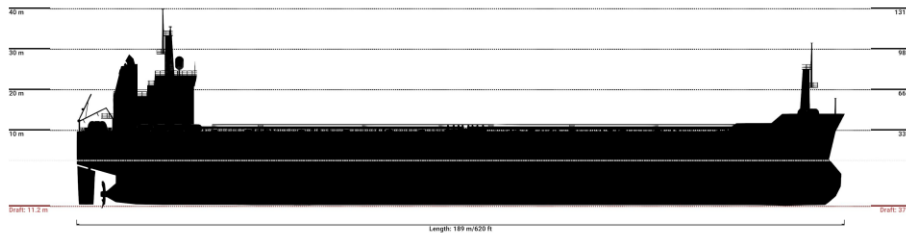


## LOFARGRAM CRUISE SPEED (Hz)

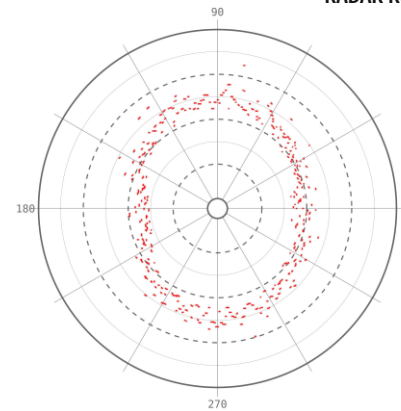




## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A small product tanker typically used for regional transport of refined petroleum products, chemicals, or vegetable oils. Handysize tankers are valued for their port accessibility and operational flexibility.

### TYPE

- Tanker

### DIMENSIONS

- Length: 190.0 m
- Beam: 32.6 m
- Draft: 13.0 m
- Displacement: 16955.0 tons

### SPEEDS

- Max: 13.0 kts
- Cruise: 11.0 kts

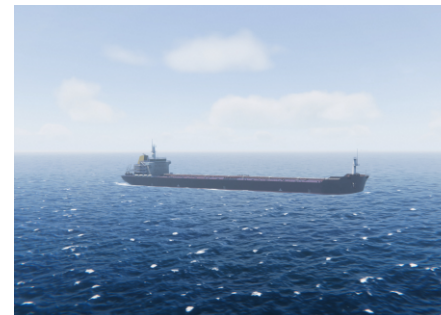
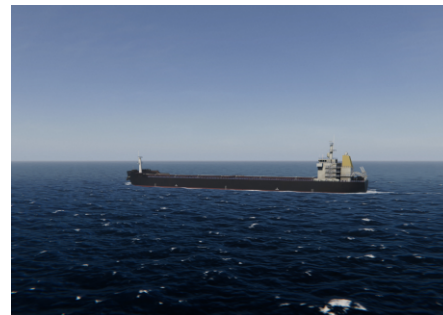
## MACHINERY

### ENGINE(S)

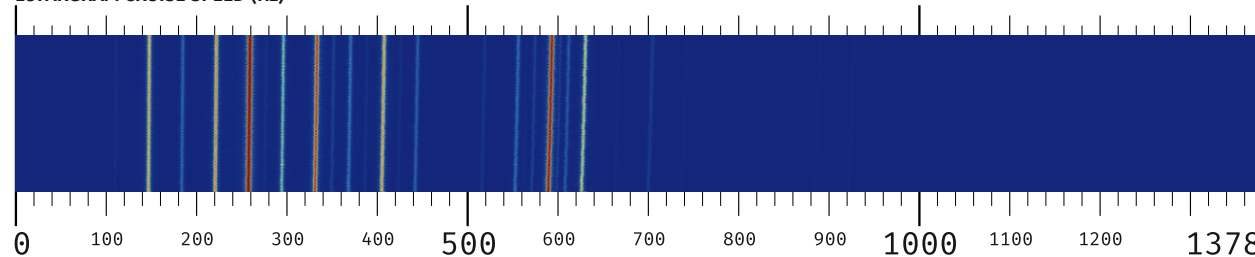
- Wärtsilä 8L32
- Cycles: 4, Cylinders: 8l
- Power: 4 500 kW (6 120 shp)
- CMP: Geared, Gear ratio: 5:1
- Engine RPM: 750

### SHAFT(S)

- #: 1
- Blades: 4,  $\phi$ : 4.2 m
- Shaft RPM: 150

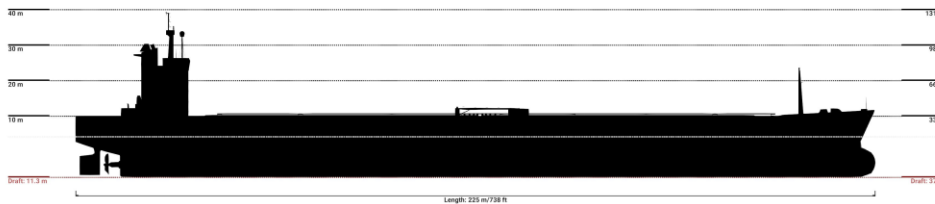


## LOFARGRAM CRUISE SPEED (Hz)

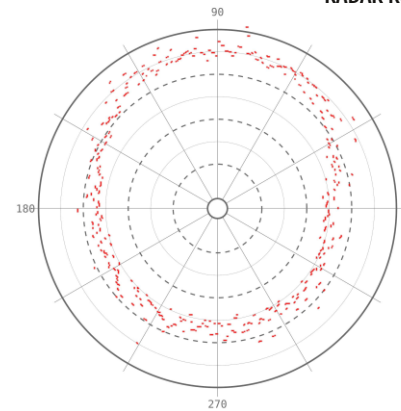


# ▶ Panamax Tanker Ishibari 75P Eco Class

## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A mid-sized tanker built to the maximum dimensions of the original Panama Canal. Panamax tankers are widely used for transporting crude oil and refined products across major international routes.

**TYPE**  
• Tanker

**DIMENSIONS**  
• Length: 225.0 m  
• Beam: 32.0 m  
• Draft: 14.0 m  
• Displacement: 40000.0 tons

**SPEEDS**  
• Max: 16.1 kts  
• Cruise: 13.6 kts

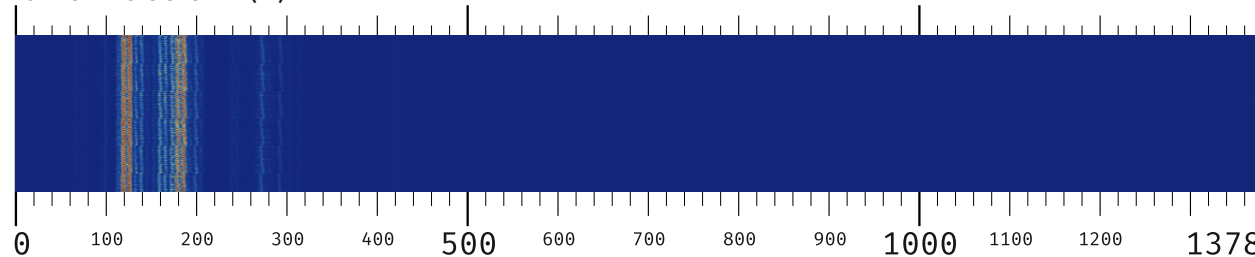
## MACHINERY

**ENGINE(S)**  
• MAN B&W 6S60MC-C  
• Cycles: 2, Cylinders: 6  
• Power: 11 000 kW (15 000 shp)  
• CMP: Direct, Gear ratio: 1:1  
• Engine RPM: 90

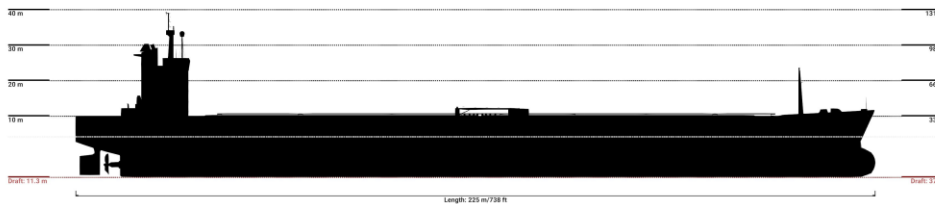
**SHAFT(S)**  
• #: 1  
• Blades: 4,  $\phi$ : 7.0 m  
• Shaft RPM: 90



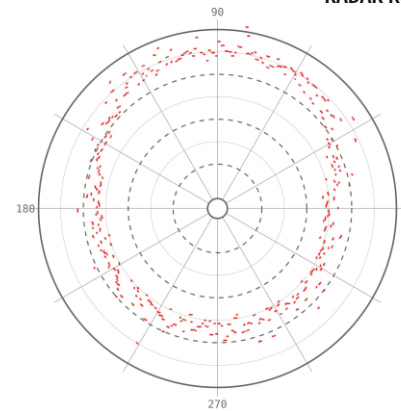
## LOFARGRAM CRUISE SPEED (Hz)



## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A mid-sized tanker built to the maximum dimensions of the original Panama Canal. Panamax tankers are widely used for transporting crude oil and refined products across major international routes.

**TYPE**  
• Tanker

**DIMENSIONS**  
• Length: 225.0 m  
• Beam: 32.0 m  
• Draft: 14.0 m  
• Displacement: 40005.0 tons

**SPEEDS**  
• Max: 15.5 kts  
• Cruise: 13.1 kts

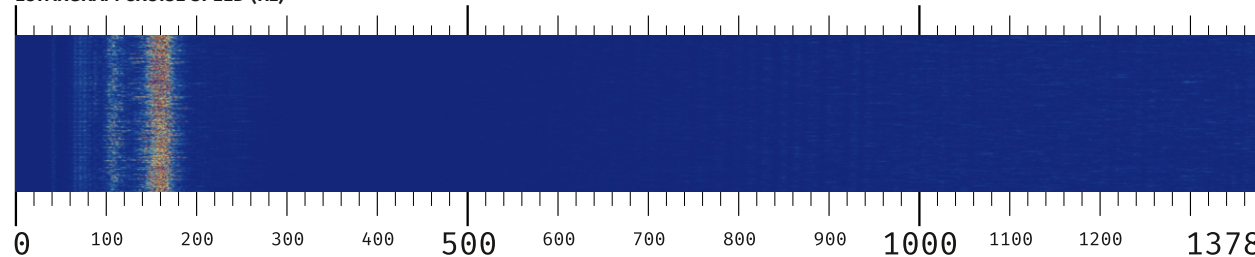
## MACHINERY

**ENGINE(S)**  
• MAN B&W 5S60MC-C  
• Cycles: 2, Cylinders: 5  
• Power: 10 000 kW (13 600 shp)  
• CMP: Direct, Gear ratio: 1:1  
• Engine RPM: 95

**SHAFT(S)**  
• #: 1  
• Blades: 4,  $\phi$ : 6.8 m  
• Shaft RPM: 95



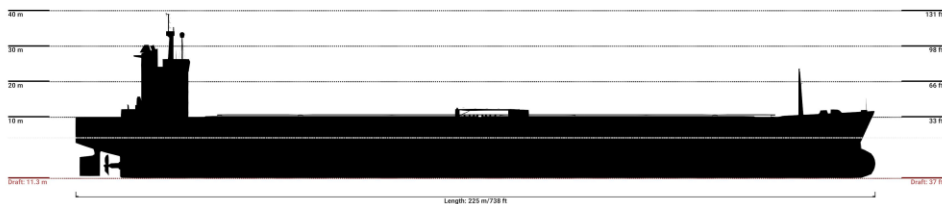
## LOFARGRAM CRUISE SPEED (Hz)



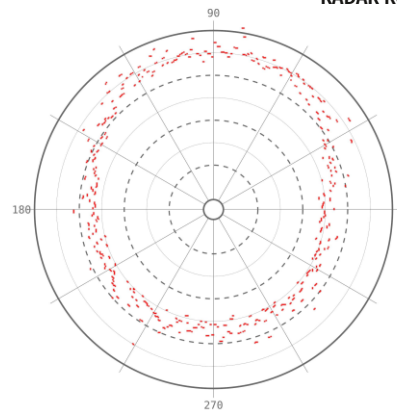
# ▶ Panamax Tanker Hakodai 76 CleanMax Class



## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

A mid-sized tanker built to the maximum dimensions of the original Panama Canal. Panamax tankers are widely used for transporting crude oil and refined products across major international routes.

**TYPE**  
• Tanker

**DIMENSIONS**  
• Length: 225.0 m  
• Beam: 32.0 m  
• Draft: 14.0 m  
• Displacement: 40010.0 tons

**SPEEDS**  
• Max: 16.0 kts  
• Cruise: 13.5 kts

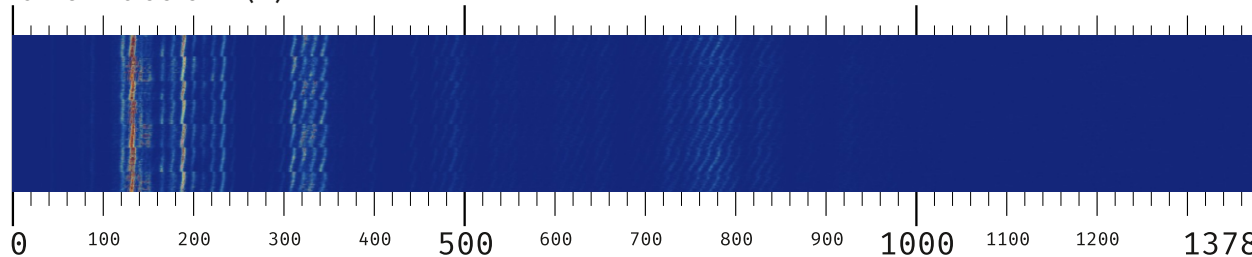
## MACHINERY

**ENGINE(S)**  
• Wärtsilä RT-flex50  
• Cycles: 2, Cylinders: 6  
• Power: 10 470 kW (14 200 shp)  
• CMP: Direct, Gear ratio: 1:1  
• Engine RPM: 120

**SHAFT(S)**  
• #: 1  
• Blades: 5,  $\phi$ : 7.0 m  
• Shaft RPM: 120

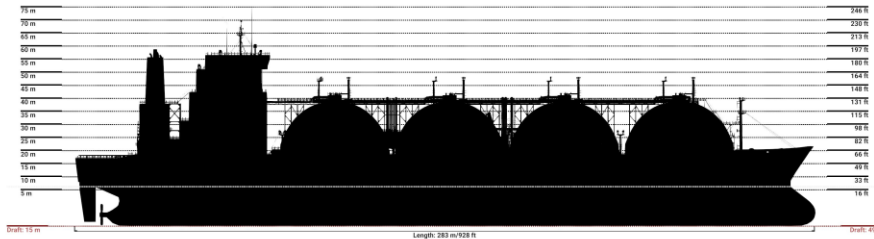


## LOFARGRAM CRUISE SPEED (Hz)

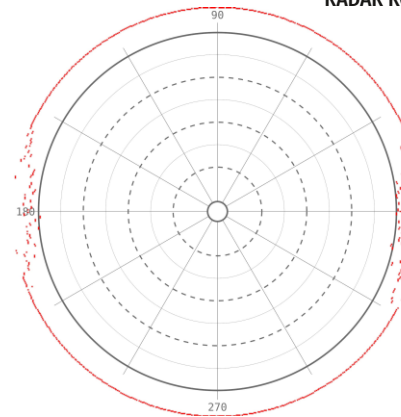




IDENTIFICATION AND CHARACTERISTICS DIAGRAM



RADAR RCS



SPECIFICATION

A Very Large Gas Carrier (VLGC) is a specialized vessel designed to transport liquefied petroleum gas (LPG) in bulk, typically with capacities around 80,000–85,000 cubic meters. VLGCs play a key role in long-haul global LPG trade between major export and import terminals.

TYPE

- Tanker

DIMENSIONS

- Length: 283.0 m
- Beam: 56.0 m
- Draft: 15.0 m
- Displacement: 84000.0 tons

SPEEDS

- Max: 16.5 kts
- Cruise: 14.0 kts

MACHINERY

ENGINE(S)

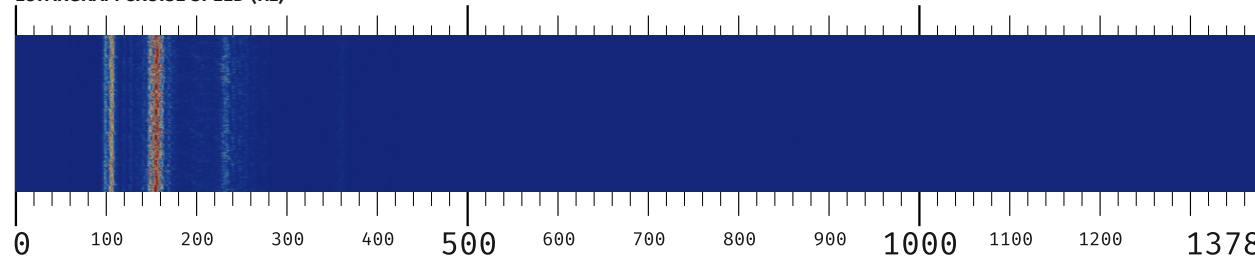
- MAN B&W 6S60MC-C
- Cycles: 2, Cylinders: 6
- Power: 11 500 kW (15 600 shp)
- CMP: Direct, Gear ratio: 1:1
- Engine RPM: 90

SHAFT(S)

- #: 1
- Blades: 4,  $\phi$ : 8.2 m
- Shaft RPM: 90



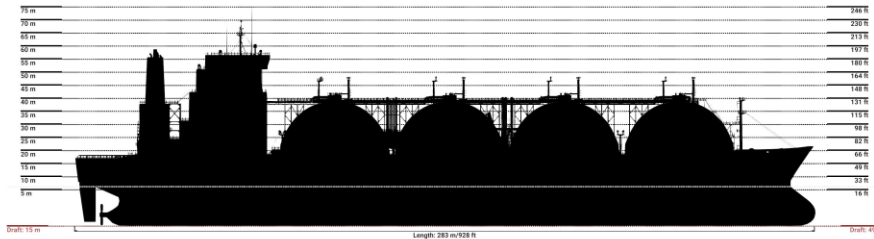
LOFARGRAM CRUISE SPEED (Hz)



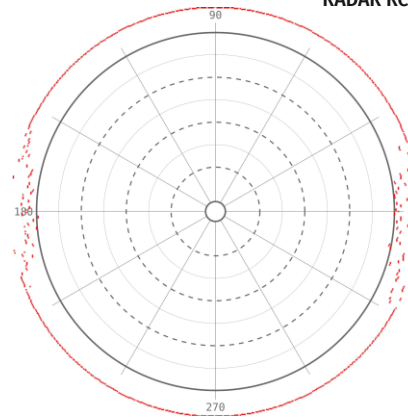




IDENTIFICATION AND CHARACTERISTICS DIAGRAM



RADAR RCS



SPECIFICATION

A Very Large Gas Carrier (VLGC) is a specialized vessel designed to transport liquefied petroleum gas (LPG) in bulk, typically with capacities around 80,000–85,000 cubic meters. VLGCs play a key role in long-haul global LPG trade between major export and import terminals.

TYPE

- Tanker

DIMENSIONS

- Length: 283.0 m
- Beam: 56.0 m
- Draft: 15.1 m
- Displacement: 84250.0 tons

SPEEDS

- Max: 16.0 kts
- Cruise: 13.5 kts

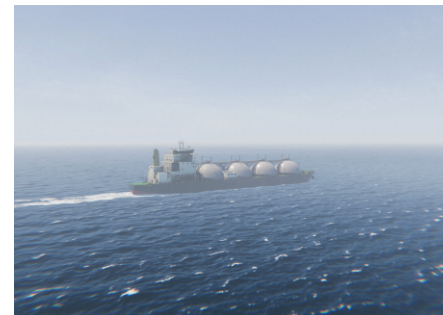
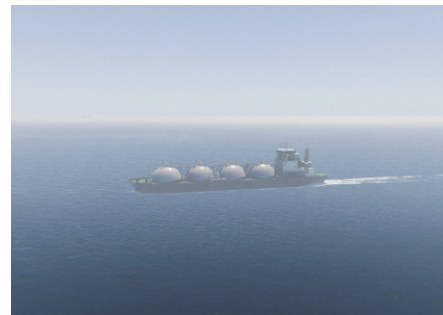
MACHINERY

ENGINE(S)

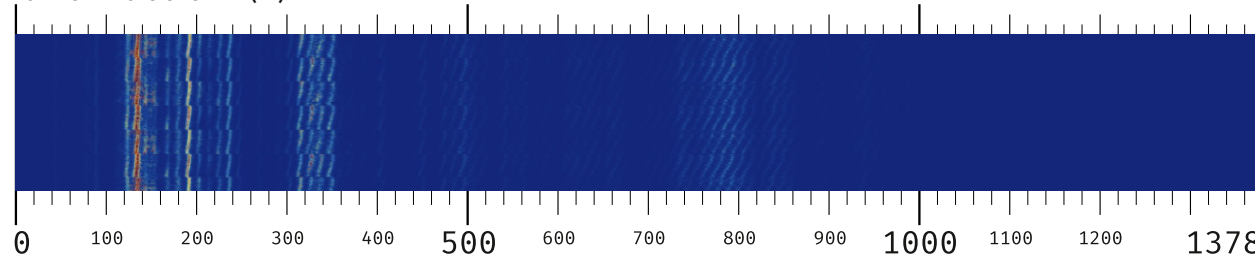
- Wärtsilä RT-flex50
- Cycles: 2, Cylinders: 6
- Power: 10 470 kW (14 200 shp)
- CMP: Direct, Gear ratio: 1:1
- Engine RPM: 120

SHAFT(S)

- #: 1
- Blades: 5,  $\phi$ : 8.5 m
- Shaft RPM: 120



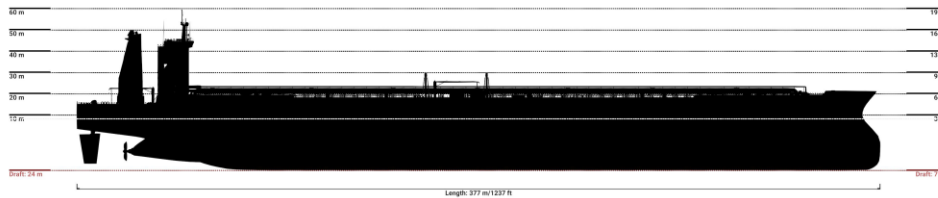
LOFARGRAM CRUISE SPEED (Hz)



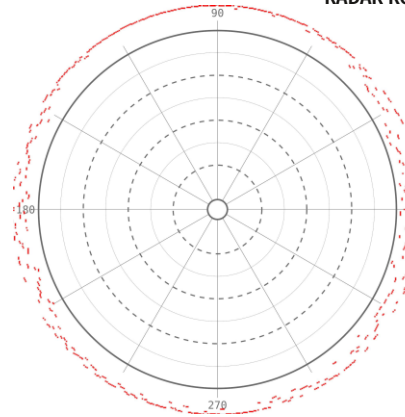
# ▶ ULCC TSI Class



## IDENTIFICATION AND CHARACTERISTICS DIAGRAM



## RADAR RCS



## SPECIFICATION

An Ultra Large Crude Carrier (ULCC) is one of the largest oil tankers ever built, designed to transport massive quantities of unrefined crude oil over long distances. Due to their immense size, ULCCs are limited to deep-water ports and major oil trade routes.

**TYPE**  
• Tanker

**DIMENSIONS**  
• Length: 376.0 m  
• Beam: 68.0 m  
• Draft: 25.0 m  
• Displacement: 349000.0 tons

**SPEEDS**  
• Max: 16.5 kts  
• Cruise: 14.0 kts

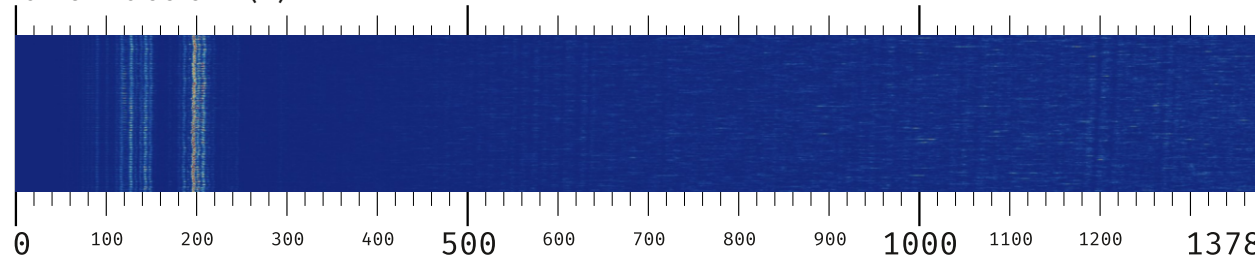
## MACHINERY

**ENGINE(S)**  
• MAN B&W 7S90ME-C10  
• Cycles: 2, Cylinders: 7  
• Power: 48 500 kW (65 900 shp)  
• CMP: Direct, Gear ratio: 1:1  
• Engine RPM: 85

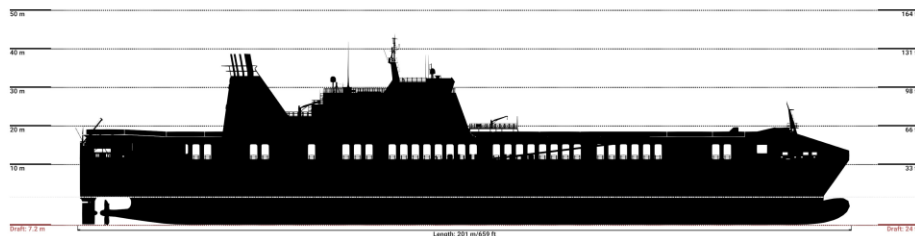
**SHAFT(S)**  
• #: 1  
• Blades: 5,  $\phi$ : 10.5 m  
• Shaft RPM: 85



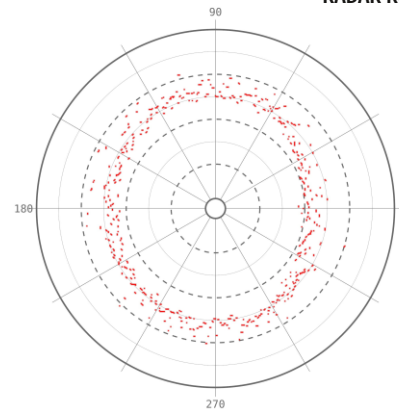
## LOFARGRAM CRUISE SPEED (Hz)



IDENTIFICATION AND CHARACTERISTICS DIAGRAM



RADAR RCS



SPECIFICATION

A ConRo (Container-RoRo) ship combines roll-on/roll-off and container capabilities, allowing it to carry wheeled cargo such as trucks and trailers on the lower decks while transporting containerized goods on the upper decks. This versatile design maximizes cargo flexibility for regional and international routes, balancing speed, cargo capacity, and port accessibility.

TYPE

- Passenger

DIMENSIONS

- Length: 200.0 m
- Beam: 28.0 m
- Draft: 7.3 m
- Displacement: 38000.0 tons

SPEEDS

- Max: 25.0 kts
- Cruise: 17.5 kts

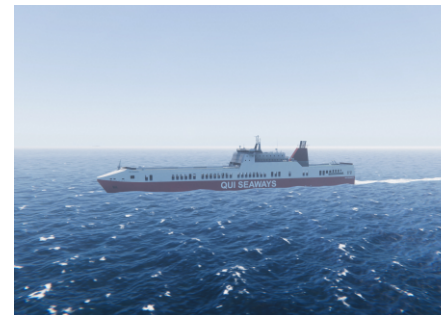
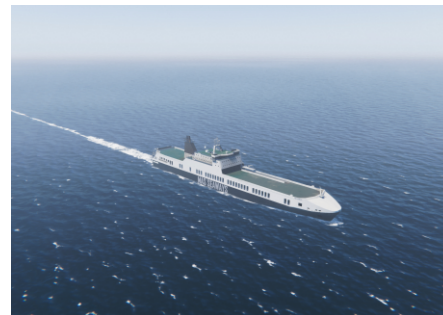
MACHINERY

ENGINE(S)

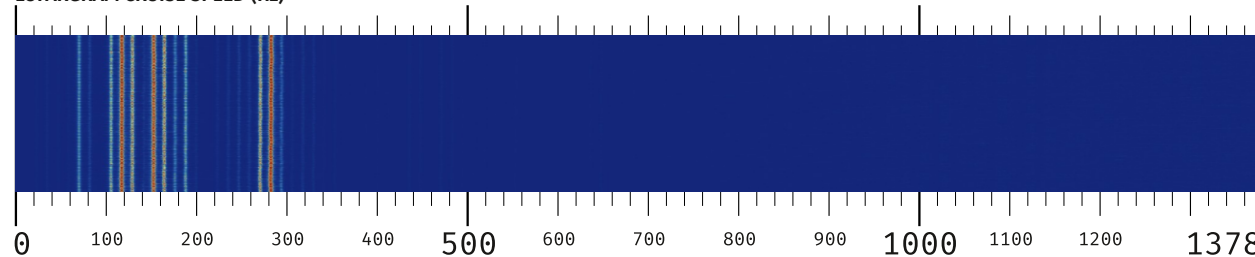
- MAN-B&W 9L60MC-C
- Cycles: 2, Cylinders: 9
- Power: 20 070 kW (27 300 shp)
- CMP: Direct, Gear ratio: 1:1
- Engine RPM: 120

SHAFT(S)

- #: 1
- Blades: 5,  $\phi$ : 7.0 m
- Shaft RPM: 120



LOFARGRAM CRUISE SPEED (Hz)



# 4. AIRCRAFT

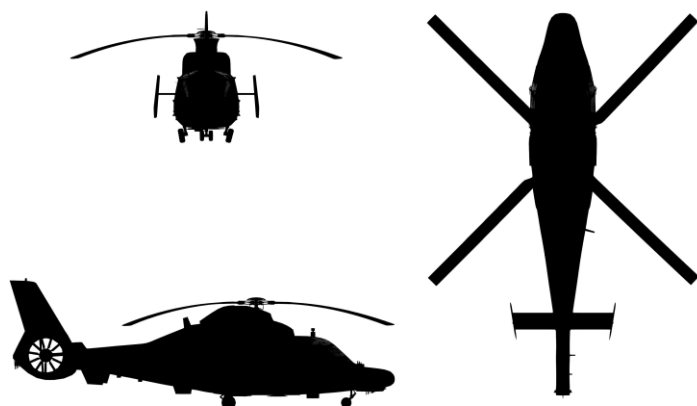


**THIS PAGE INTENTIONALLY LEFT BLANK**

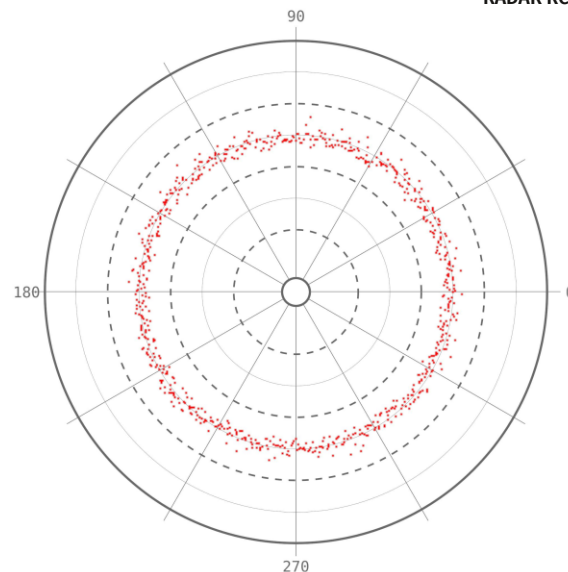


# ▶ Harbin Z-9C

## IDENTIFICATION DIAGRAM



## RADAR RCS



## SPECIFICATION

Licensed-built variant of the Eurocopter Dauphin. It serves as the primary shipborne ASW and SAR asset for PLAN frigates.

### TYPE

- Anti-submarine warfare helicopter
- Crew: 2

### DIMENSIONS

- Length: 13.46 m
- Wingspan: 11.93 m
- Height: 4.01 m

### WEIGHTS

- Empty weight: 2050.0 kg
- Max take off weight: 3850.0 kg

## PERFORMANCE

### SPEEDS

- Min speed: 0.0 kts
- Cruise speed: 154.0 kts
- Max speed: 165.0 kts

### ALTITUDE

- Min altitude: 0.0 m
- Max altitude: 4500.0 m

### RANGES

- Endurance: 5.0 hr
- Max range: 1000.0 km

## SENSORS

- RADAR: KLC-1
- SONAR: 605
- VISUAL: EO/IR
- EW: -

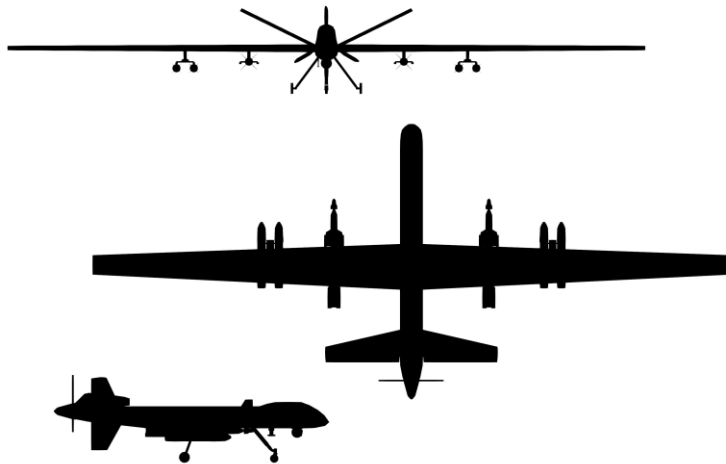
## ARMAMENT

- GUNS: 12.7mm
- MISSILES: TL-10, ET52
- TORPEDOES: Yu-7
- COUNTERMEASURES: Flares

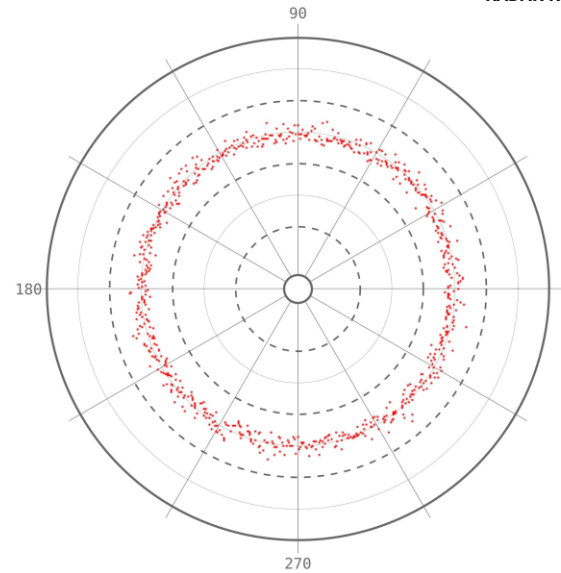




IDENTIFICATION DIAGRAM



RADAR RCS



SPECIFICATION

Remotely piloted "hunter-killer" platform equipped with a Multi-Spectral Targeting System for ISR and precision strike missions.

TYPE

- Unmanned combat aerial vehicle
- Crew: 0

DIMENSIONS

- Length: 11.0 m
- Wingspan: 20.0 m
- Height: 3.8 m

WEIGHTS

- Empty weight: 2223.0 kg
- Max take off weight: 4760.0 kg

PERFORMANCE

SPEEDS

- Min speed: 78.0 kts
- Cruise speed: 169.0 kts
- Max speed: 240.0 kts

ALTITUDE

- Min altitude: 0.0 m
- Max altitude: 15240.0 m

RANGES

- Endurance: 27.0 hr
- Max range: 1900.0 km

SENSORS

- RADAR: AN/APY-8
- SONAR: -
- VISUAL: AN/DAS-1 MTS-B
- EW: AN/ALR-69

ARMAMENT

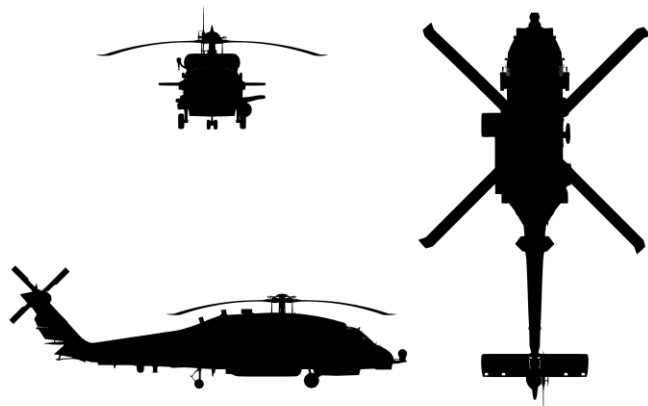
- GUNS: -
- MISSILES: AGM-114, AIM-9
- TORPEDOES: -
- COUNTERMEASURES: Flares



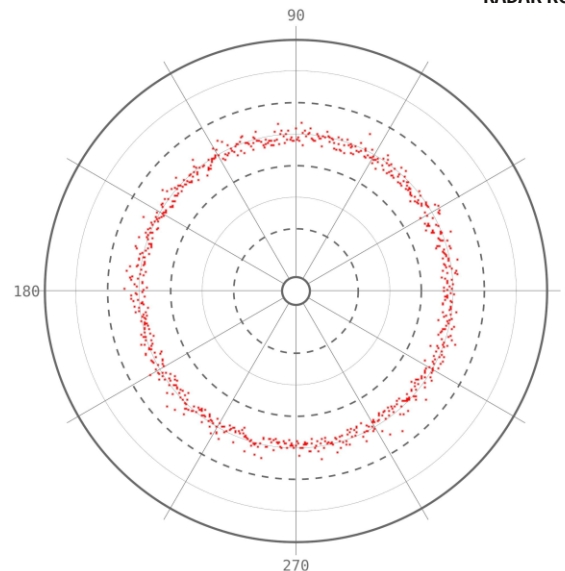
# MH-60R Seahawk



## IDENTIFICATION DIAGRAM



## RADAR RCS



## SPECIFICATION

The "Romeo" multi-mission naval helicopter is the latest incarnation of the Seahawk family. It features advanced digital sensors for ASW, ASuW, and integrated electronic warfare.

### TYPE

- Anti-submarine warfare helicopter
- Crew: 4

### DIMENSIONS

- Length: 19.76 m
- Wingspan: 16.35 m
- Height: 5.18 m

### WEIGHTS

- Empty weight: 6895.0 kg
- Max take off weight: 10659.0 kg

## PERFORMANCE

### SPEEDS

- Min speed: 0.0 kts
- Cruise speed: 135.0 kts
- Max speed: 146.0 kts

### ALTITUDE

- Min altitude: 0.0 m
- Max altitude: 3650.0 m

### RANGES

- Endurance: 4.0 hr
- Max range: 450.0 km

## SENSORS

- RADAR: AN/APS-147, AN/APS-153
- SONAR: AN/AQS-22
- VISUAL: AN/AAS-44
- EW: AN/ALQ-210

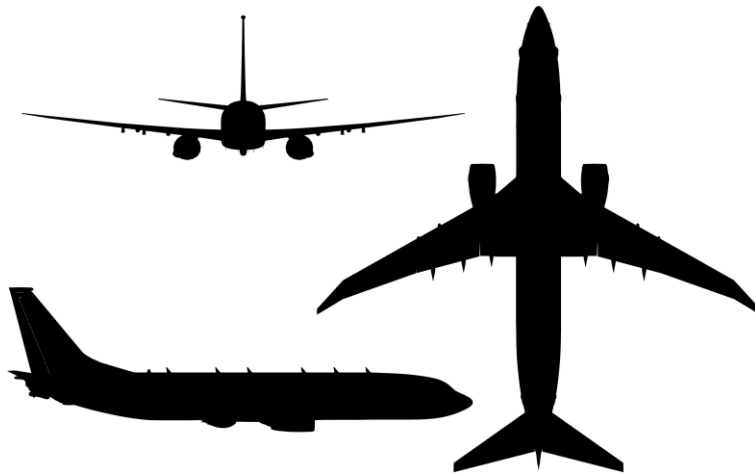
## ARMAMENT

- GUNS: 7.62mm, 12.7mm
- MISSILES: AGM-114, AGM-119
- TORPEDOES: Mk-46, Mk-50, Mk-54
- COUNTERMEASURES: Flares, Chaff

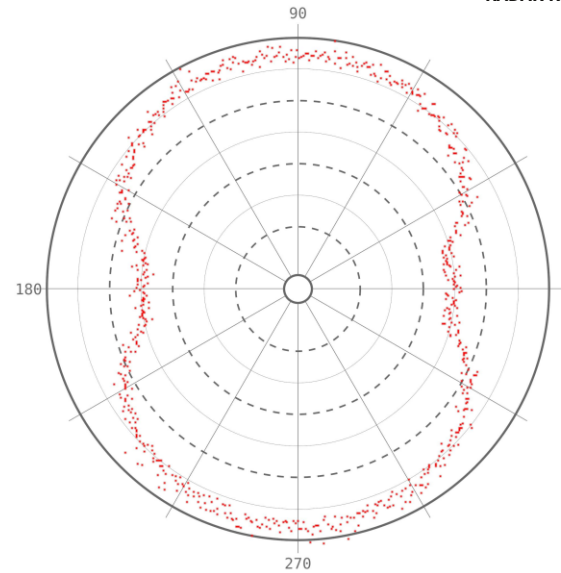




IDENTIFICATION DIAGRAM



RADAR RCS



SPECIFICATION

Premier long-range maritime patrol aircraft utilizing the modern radar and internal sonobuoy rotary launchers.

TYPE

- Anti-submarine warfare
- Crew: 9

DIMENSIONS

- Length: 39.47 m
- Wingspan: 37.64 m
- Height: 12.83 m

WEIGHTS

- Empty weight: 62730.0 kg
- Max take off weight: 85820.0 kg

PERFORMANCE

SPEEDS

- Min speed: 178.0 kts
- Cruise speed: 440.0 kts
- Max speed: 487.0 kts

ALTITUDE

- Min altitude: 60.0 m
- Max altitude: 12496.0 m

RANGES

- Endurance: 10.0 hr
- Max range: 2222.0 km

SENSORS

- RADAR: AN/APY-10
- SONAR: Sonobuoys
- VISUAL: MX-20HD
- EW: AN/ALQ-240

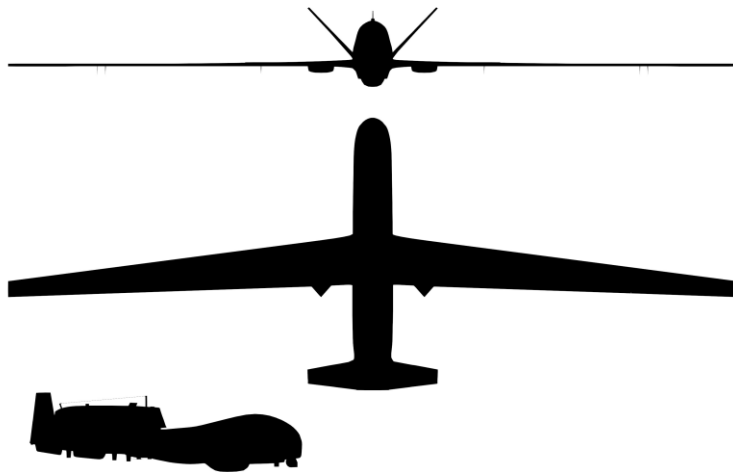
ARMAMENT

- GUNS: -
- MISSILES: AGM-84D, AGM-84H/K
- TORPEDOES: Mk-54
- COUNTERMEASURES: Flares, DIRCM

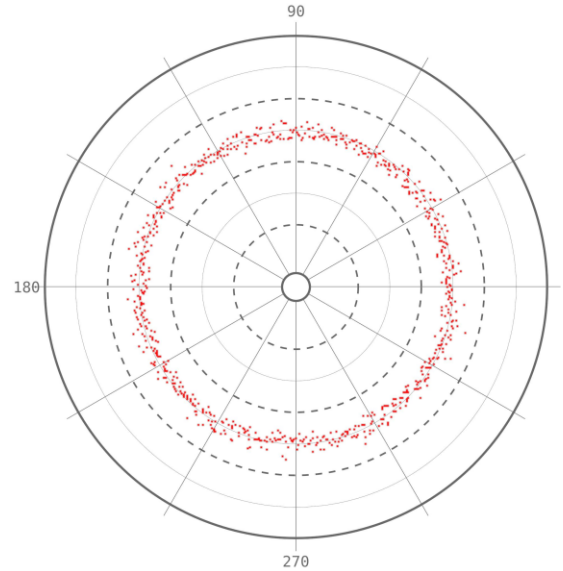


# MQ-4C Triton

## IDENTIFICATION DIAGRAM



## RADAR RCS



## SPECIFICATION

High-Altitude Long-Endurance (HALE) UAV. It provides persistent wide-area maritime surveillance and signals intelligence.

### TYPE

- Unmanned combat aerial vehicle
- Crew: 0

### DIMENSIONS

- Length: 14.5 m
- Wingspan: 39.9 m
- Height: 4.7 m

### WEIGHTS

- Empty weight: 6781.0 kg
- Max take off weight: 14628.0 kg

## PERFORMANCE

### SPEEDS

- Min speed: 113.0 kts
- Cruise speed: 286.0 kts
- Max speed: 310.0 kts

### ALTITUDE

- Min altitude: 0.0 m
- Max altitude: 17000.0 m

### RANGES

- Endurance: 30.0 hr
- Max range: 13700.0 km

## SENSORS

- RADAR: AN/ZPY-3
- SONAR: -
- VISUAL: MTS-B
- EW: AN/ALR-89

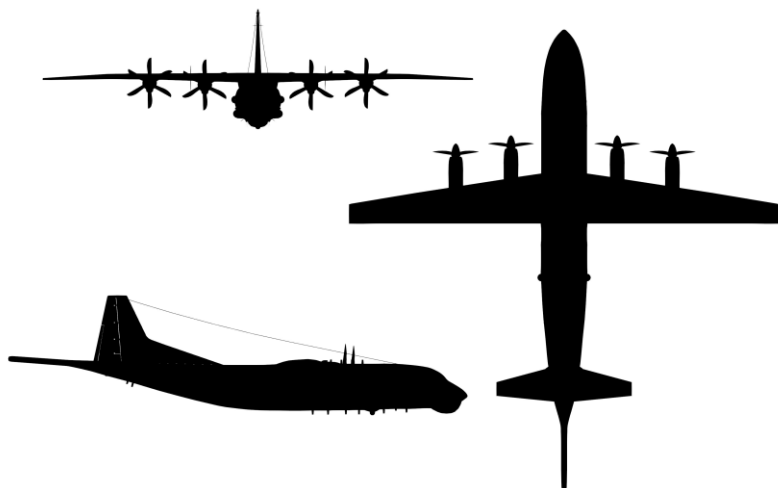
## ARMAMENT

- GUNS: -
- MISSILES: -
- TORPEDOES: -
- COUNTERMEASURES: Chaff, Flares

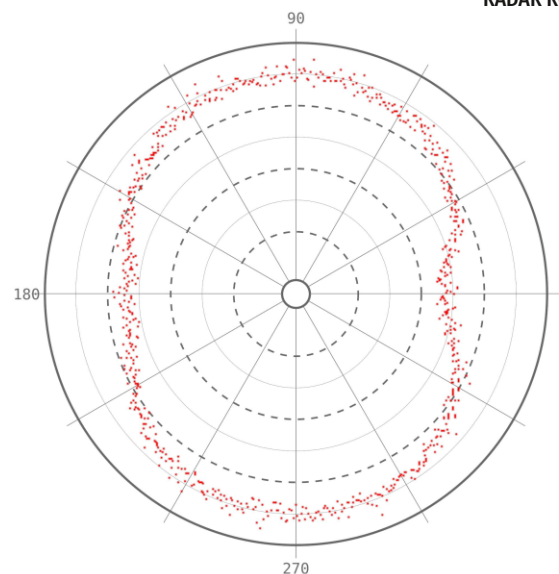




IDENTIFICATION DIAGRAM



RADAR RCS



SPECIFICATION

Specialized ASW platform based on the Y-8 airframe, distinguished by its large Magnetic Anomaly Detector (MAD) tail boom and internal weapons bay.

TYPE

- Anti-submarine warfare
- Crew: 10

DIMENSIONS

- Length: 34.02 m
- Wingspan: 38.0 m
- Height: 11.6 m

WEIGHTS

- Empty weight: 35488.0 kg
- Max take off weight: 61000.0 kg

PERFORMANCE

SPEEDS

- Min speed: 134.0 kts
- Cruise speed: 297.0 kts
- Max speed: 356.0 kts

ALTITUDE

- Min altitude: 50.0 m
- Max altitude: 10400.0 m

RANGES

- Endurance: 10.5 hr
- Max range: 5615.0 km

SENSORS

- RADAR: Type 6, MAD
- SONAR: Sonobuoys
- VISUAL: EO/IR
- EW: Type 825

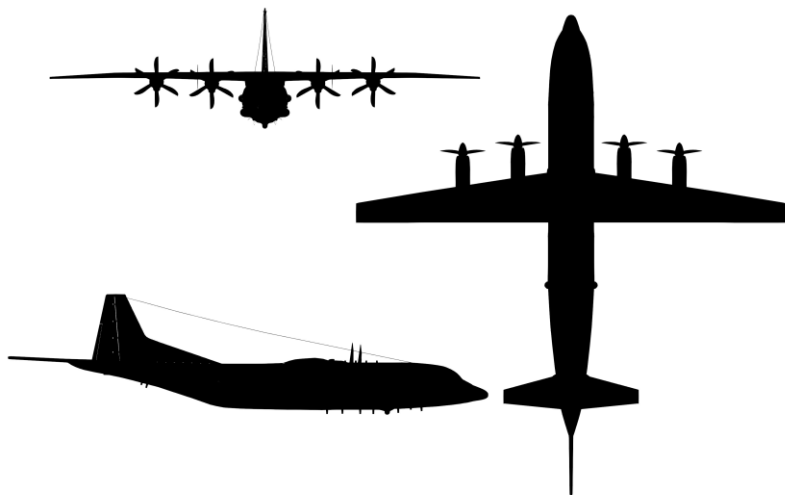
ARMAMENT

- GUNS: -
- MISSILES: TL-7, YJ-83K
- TORPEDOES: Yu-7, Yu-11
- COUNTERMEASURES: Flares

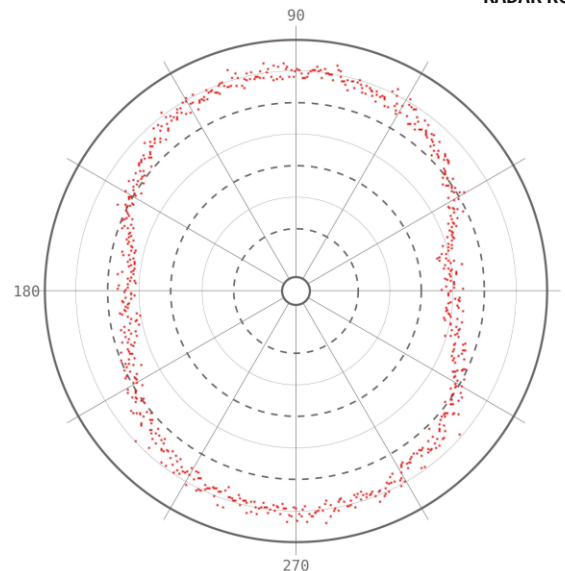


# ▶ Shaanxi Y-9Q

## IDENTIFICATION DIAGRAM



## RADAR RCS



## SPECIFICATION

Advanced maritime patrol and ASW aircraft based on the Y-9 airframe identified by a distinctive elongated MAD boom, ventral radome, and internal sonobuoy dispensers.

### TYPE

- Anti-submarine warfare
- Crew: 10

### DIMENSIONS

- Length: 36.0 m
- Wingspan: 38.0 m
- Height: 11.3 m

### WEIGHTS

- Empty weight: 39000.0 kg
- Max take off weight: 77000.0 kg

## PERFORMANCE

### SPEEDS

- Min speed: 134.0 kts
- Cruise speed: 297.0 kts
- Max speed: 351.0 kts

### ALTITUDE

- Min altitude: 50.0 m
- Max altitude: 10400.0 m

### RANGES

- Endurance: 10.0 hr
- Max range: 5000.0 km

## SENSORS

- RADAR: Type 6, MAD
- SONAR: Sonobuoys
- VISUAL: EO/IR
- EW: Type 825

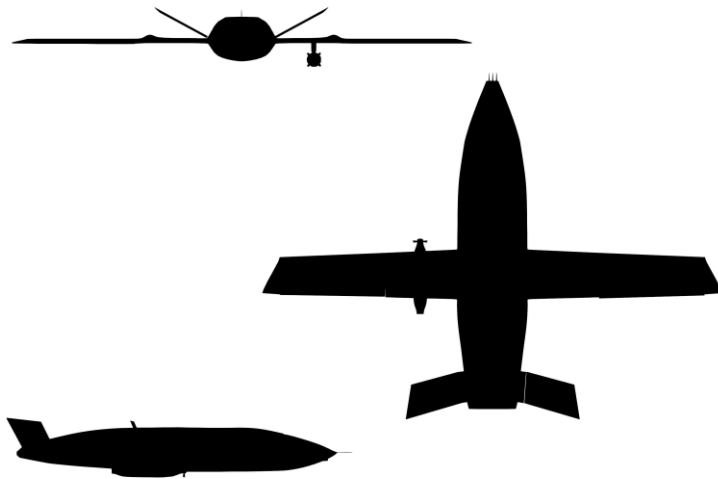
## ARMAMENT

- GUNS: -
- MISSILES: TL-7, YJ-83K
- TORPEDOES: Yu-7, Yu-11
- COUNTERMEASURES: Flares

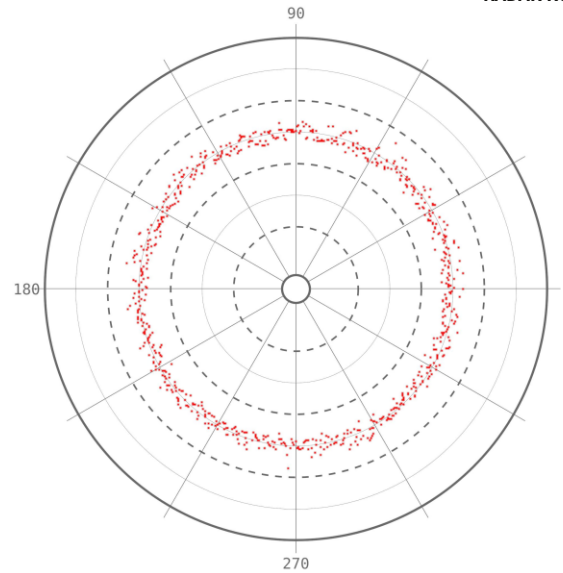




IDENTIFICATION DIAGRAM



RADAR RCS



SPECIFICATION

Groundbreaking carrier-based unmanned tanker, designed to provide aerial refueling to extend the strike range of the carrier air wing.

TYPE

- Tanker aircraft
- Crew: 0

DIMENSIONS

- Length: 15.5 m
- Wingspan: 22.9 m
- Height: 3.0 m

WEIGHTS

- Empty weight: 11000.0 kg
- Max take off weight: 20000.0 kg

PERFORMANCE

SPEEDS

- Min speed: 97.0 kts
- Cruise speed: 270.0 kts
- Max speed: 324.0 kts

ALTITUDE

- Min altitude: 0.0 m
- Max altitude: 10000.0 m

RANGES

- Endurance: 12.0 hr
- Max range: 925.0 km

SENSORS

- RADAR: -
- SONAR: -
- VISUAL: MTS-B
- EW: -

ARMAMENT

- GUNS: -
- MISSILES: -
- TORPEDOES: -
- COUNTERMEASURES: -

