

ORCA DF-101
IS AN
IDENTIFICATION
AND RECOVERY
SYSTEM FOR
NAVY FLEETS



DF-101 User Manual and Installation Guide



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1.0 DF-101 Introduction

The DF-101 direction finder is an interferometer signal processor and provides the relative bearing to a 121.5 MHz transmission. Each DF-101 consists of a display unit and an antenna array. This system is mounted on the navigation bridge and small boat to assist in the location and recovery of an MOB.

2.0 DF-101 Parts Overview

A – Power On/Off (Red) Button	I – Warning LED
B – Power On/Off LED	J – Signal Strength Indicator
C – Squelch Increase Button	K – Numeric Bearing Indicator
D – Squelch Decrease Button	L – Speaker (4 Ports)
E – Display Dimmer Button	M – Circular Display Bearing Indicator (36 LEDs)
F – Speaker On/Off Button	N – Data Connector
G – Speaker On/Off LED	O – Power Connector
H – Clear (Depress Squelch Decrease [D] & Dim [E] Simultaneously)	P – DF101 Antenna Array



Figure 1. DF-101 Display (Front View)

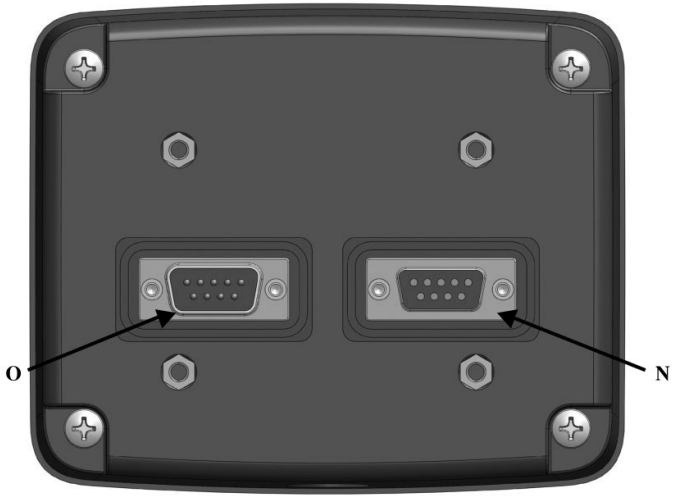


Figure 2. DF-101 Display (Back View)

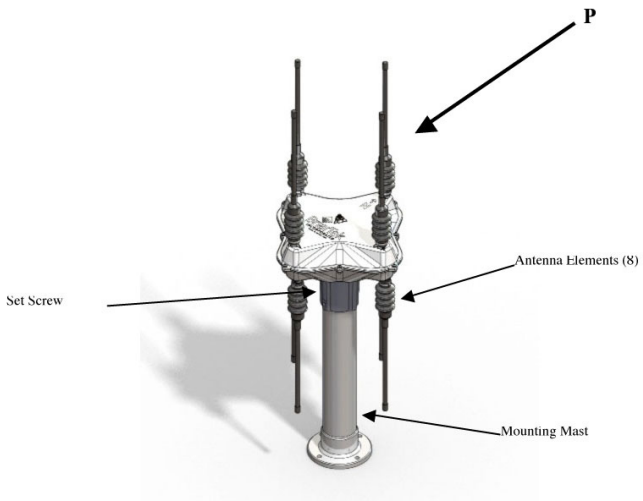


Figure 2. DF-101 Display (Back View)

3.0 DF-101 Functions

3.1 Power On/Off

The Power On/Off button (A) provides power to the system and restores default settings. When button is held down for at least one second, the display will perform a system check to determine that the DF-101 is functioning properly. While it is performing this check, all LEDs will illuminate. After the system check is complete, the only remaining illuminated LEDs will be the Power On LED (B), the Speaker On/Off LED and the Numeric Bearing Indicator (K) will display “---”. **Note: the illuminated Speaker On/Off LED indicates the speaker is off. Press the Speaker On/Off button to turn on the speaker.** Check to ensure the Warning LED (I) is not illuminated; if the Warning LED is illuminated, service is required. To turn the direction finder off, hold down Power button (A) for at least one second; all LEDs will extinguish.

3.2 Speaker

The speaker (L) provides the audible indication of the received distress signal. The Speaker On/Off button (F) toggles the speaker on and off. When the Speaker On/Off LED (G) is illuminated, the speaker is off.

3.3 Clear

Clear (H) is used to clear the DF-101 internal data used to calculate bearing; it resets to an un-averaged bearing value. Clear the display by depressing the Squelch decrease button (D) and Dim button (E) simultaneously. When the data is cleared, the bearing LEDs will illuminate in the same pattern as when the unit is first powered on.

3.4 Squelch

Squelch is used to filter undesired signals that may be present at or near 121.5 MHz. These signals are typically found in high traffic areas such as shipping channels, airport flight paths, and populated areas. It is also used to reduce interference noise from own ship RF emissions. Increasing squelch will cause a decrease in range of the DF. Therefore it is recommended that the squelch be decreased when operating away from high traffic areas in order to maximize system range.

Changing the squelch level: Press and hold the “Squelch +” button (C) or the “Squelch –” button (D) to enter squelch mode and increase/decrease the squelch level. While in squelch mode, a squelch value will be displayed on the numeric bearing indicator (K) as well as on the LED bearing indicators (M). Values for squelch are 0-360. Release squelch increase/decrease button when desired squelch level is achieved. The DF will return to bearing display mode five seconds after release of button.

3.5 Dim

The display dimmer button (E) enables the user to dim the display LEDs. The display has 3 levels of illumination. Push the button to decrease the illumination.

3.6 Signal Strength

The signal strength indicator LEDs (J) indicate the received signal strength on a graduated scale from 0 to 6 (0 indicating weak/no signal and 6 indicating strong signal).

3.7 Warning

The warning LED (I) alerts the user to a failure in the system. If this LED is illuminated, first turn off power (A) and check to ensure DB-9 data and power cable connections (N & O) are fully secured. Turn on power (A). If warning LED is still illuminated, see section 4.0, Maintenance and Troubleshooting procedures.

3.8 Default Settings

Default settings for the DF-101 are:

- Dim – High (brightest) value
- Squelch – Last saved value
- Speaker – OFF

NOTE: The system returns to the default settings when the DF-101 is turned on.

4.0 Installation and Repair Notes

The installation notes provided herein are intended to serve as a guide only. They do not serve as material required for the certification of technicians for the installation, repair or alteration of the ORCA® MOBI system.

NOTE: When replacing a DF-100 (see figure 4) with a DF-101, ensure that the display and antenna are replaced. The DF-101 display does not function with the DF-100 antenna; the DF-101 antenna does not function with the DF-100 display.



Figure 4. DF-101 display and antenna

4.1 Display

- a. **General.** Display should be mounted in accordance with platform-specific ship installation drawings (SIDs) for shipboard installation or BOATALT GEN47B drawings for RHIB/LCPL installation. For ship installations, the display is typically mounted near the conning officer's station. On a ship's small boat, the display is mounted on the console.
- b. **Mounting the DF Display.** Display bracket should be installed IAW SIDs or BOATALT drawings. If installing on a RHIB or LCPL, see section 4.1.c. for attaching the DF display hood.
- (1) Mate display to display bracket and attach using M4 fasteners, lock washers and threadlock provided with the display.
 - (2) Attach power and data cables to the display. If the display will be installed on a RHIB or LCPL, waterproof DB9 connectors with extended length gaskets must be installed on the data and power cables. If replacing a DF-100 with a DF-101 direction finder, replace the standard length gasket with the extended length gasket provided. See figure 6. Please refer to electrical specifications in Section 9.0, DF-101 Specifications, for connector requirements, cable pin-out information and power & grounding requirements.

WARNING: Ensure power cable leads are connected correctly. Failure to do so could result in DF display failure and will void warranty

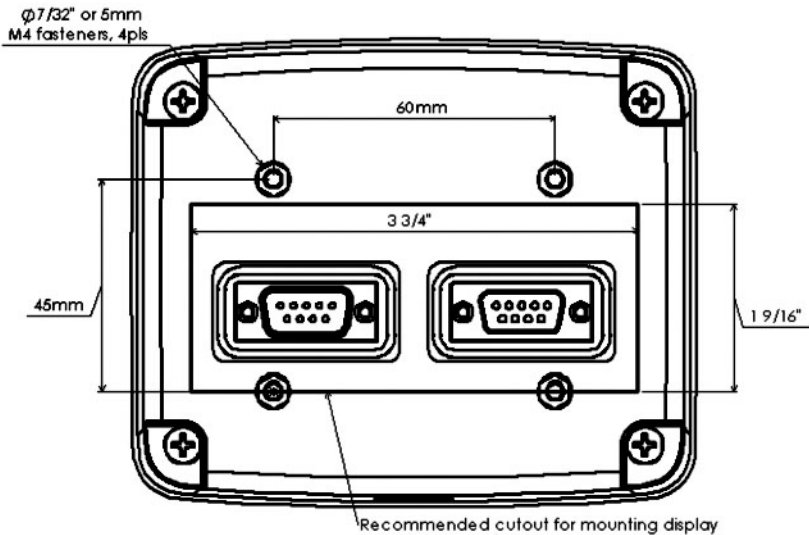


Figure 5. DF-101 Display Mounting Hole Dimensions

c. Install DF Display Hood. If installing on a RHIB or LCPL, secure rubberized DF display hood to the display bracket. You will need access to the inside of the console to perform this.

- (1) Remove forward-most bracket securing screw, washers (2) and locknut. See figure 7. Set aside screw, washers and locknut in a safe location.
- (2) Align the hood securing strap grommet with the hole in the display bracket.

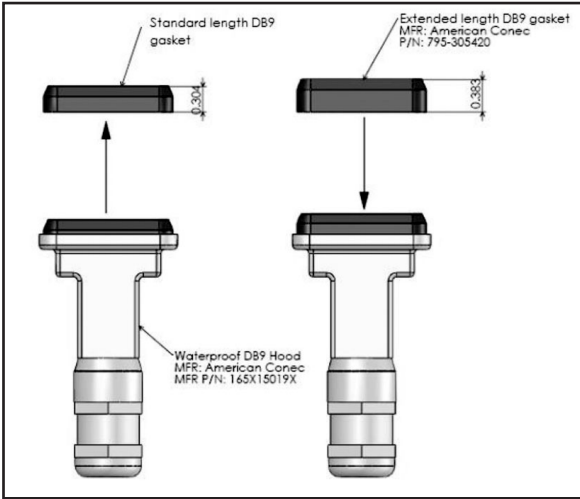


Figure 6. DB9 Gaskets



Figure 7. DF Display Bracket

- (3) From the exterior of the console, insert screw with washers (one outside and one inside console). Secure with locknut on the interior of the console.
- (4) Cover DF display with hood. See figure 9. While the DF display is not in use, display should remain covered.



Figure 8. DF Display Hood – display uncovered



Figure 9. DF Display Hood – display covered

4.2 Antenna Array

- a. **General.** The antenna array should be mounted IAW platform specific SIDs or BOALTALT drawings. In general, the antenna array should be installed at the highest point possible such as the ship's mast and away from any obstructions that would interfere with the DF's line of sight to the MOB transmitter. In practical application it is recommended that the antenna array is mounted a minimum of 3' away from any adjacent objects (i.e., GPS antenna, VHF marine radio antenna, stanchion, etc...) and located such that adjacent objects are non-planar.
- b. **Mounting the antenna array.**
 - (1) Place antenna array onto antenna mast. Dimensional requirements for mast fabrication are located in Section 9.0, DF-101 Specifications.
 - (2) Orient antenna array. Position the antenna such that the two opposing antenna elements facing relative north point parallel to the bow of the vessel (see figure 10). Relative north of the antenna array can be identified by locating the raised "N" text on top of the antenna housing and adjacent to the top, forward looking antenna element. Additionally, there is a small pressure relief valve on the bottom side of the antenna housing adjacent to the bottom, forward looking antenna element.

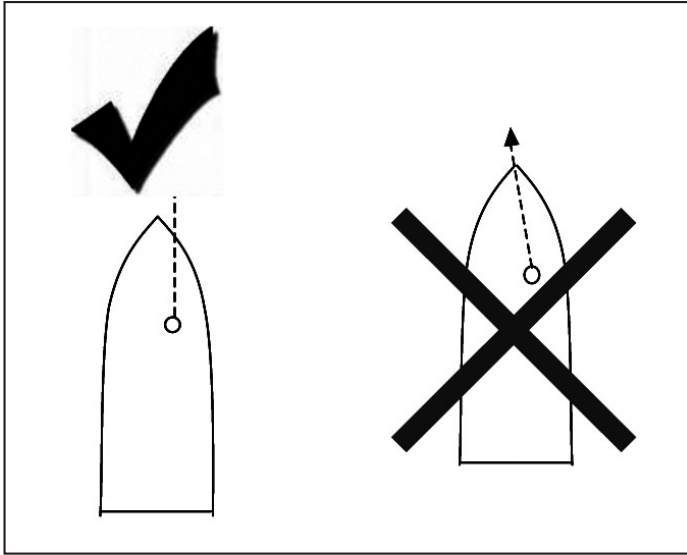


Figure 10. DF-101 Antenna Orientation

(4) If array base and mast set holes are aligned at locations indicated in figure 11, continue to step (6).

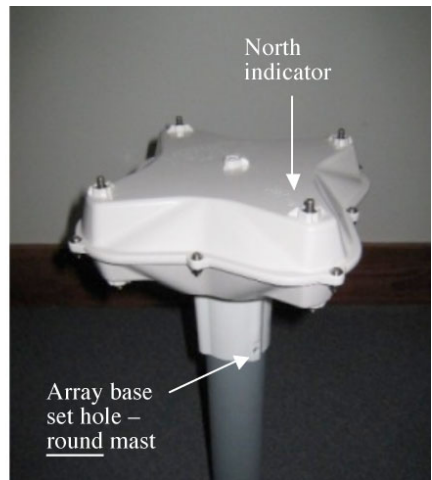
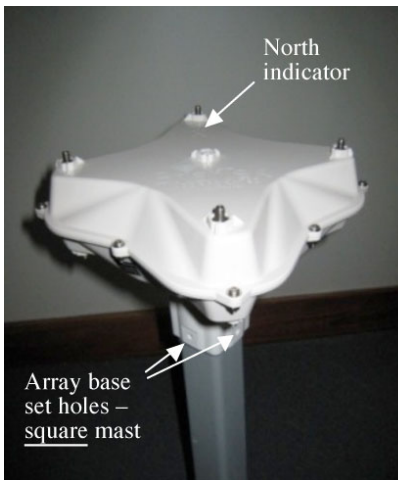


Figure 11: Array Base Set Holes

(5) If array base and mast set holes are not-aligned, drill and tap mast to align with new array base as follows:

- i. Orient DF North Arrow to bow of vessel and use punch to mark new hole location(s) on antenna mast (2 set holes on flat sides of square mast; 1 set hole on round mast).

- ii. Remove antenna array and cable if possible. On some masts, the cable will not pass back through the mast. In this case, place a metal plate in front of cable to prevent cable from being damaged when drilling.
 - iii. Using No. 7 (.201) drill bit, drill pilot holes (to be used for 1/4 x 20 tap)
 - iv. Tap each pilot hole with 1/4 x 20 tap using hand tap wrench. It is recommended to back off two turns for every turn forward until the hole is tapped through.
- (6) Connect data cable. A waterproof DB9 connector with extended-length gasket (see figure 6) must be used to maintain the water tight integrity of the antenna array.
- (7) Secure antenna array. Install a lock washer and flat washer onto a 1/4-20 x 3/4" fastener. All material should be 316 CRES. Apply anti-seize to threads of 1/4-20 fastener. Install fastener through the 1/4" hole at the antenna array mounting base and into the tapped mast. Do not over-torque or threads will strip.
- (8) Fasten antenna elements (qty 8). Apply threadlock to the threads of the antenna elements and mounting bolts (see figures 12 & 13). Screw (hand-tighten) each element on mounting bolts. Do not over-torque the antenna elements. Wipe any excess threadlock from surrounding area.

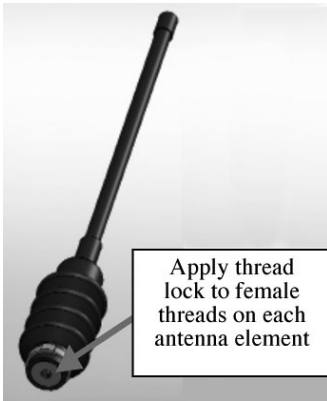


Figure 12: Thread lock on antenna element

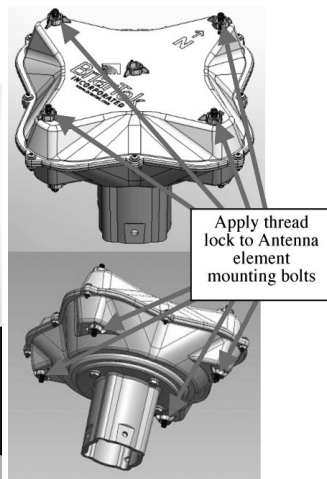


Figure 13: Mounting bolts

5.0 Small Boat Procedures

5.1 Set Up

- a. Upon manning the small boat, ensure the boat's power panel main breaker and MOBI breaker are turned on.
- b. **Locate the DF Display.** The display is mounted on the small boat (LCPL and RHIB) console in front of the coxswain.
 - (1) Remove tethered display cover.
 - (2) Turn on power at the display. The display conducts a self-diagnosis for approximately 3-4 seconds. The system is ready when the "Power On" LED is illuminated.
- c. **Locate DF-101 antenna array.** Antenna locations are as follows:
 - (1) 7/11 Meter RHIB – Mounted on transom or arch
 - (2) LCPL – mounted on cabin top, starboard side or cockpit bridge wing, starboard side.

RHIB configuration – If the antenna and mast are in the horizontal position, raise the antenna and mast to the vertical position and lock in place with the locking pin. The MOBI DF antenna array may be stowed in the horizontal position when the DF is not in use.

LCPL – If the antenna and mast are in the retracted position, extend upward and secure with locking pin.

5.2 Operation

- a. After the DF is ready to receive signal, and the boat is underway and making way, establish the general direction to the MOB by communicating with the bridge.

NOTE: Do not immediately rely on the accuracy of the DF, as the signal coming from the MOBI transmitter may reflect off the ship. This can produce a false bearing on the small boat DF display.

- b. Once there is some distance between the boat and the ship (50-100 yards, depending on the position of the MOB relative to the ship), the DF display bearings will become more accurate and should be used to determine the bearing to the MOB.

6.0 General Guidance for Bridge Watchstanders and Small Boat Personnel

- a. When the DF receives the MOB signal, the bearing indicator LED on the display will illuminate, indicating the relative bearing to the MOB. Circular display bearing accuracy is ± 5 degrees.

NOTE: Bearing indication may be sporadic, depending on weather conditions and sea state. Poor weather, high sea state, and interference from 121.5 MHz emitters (own ship or otherwise) will affect the ability of the DF to receive the signal.

- c. When the bearing to the MOB has been determined, steer the vessel toward the MOB by keeping the illuminated bearing indicator LED 10 to 20 degrees off the bow.
- d. As the small boat approaches the MOB, establish visual contact and effect recovery of the MOB.

NOTE: Recovery team must turn off transmitter to send "All Clear" signal.

- e. When the MOB is recovered, ensure recovery team turns off the transmitter. This will cause the transmitter to send "All Clear" signal to the receiver, indicating the MOB has been recovered.

7.0 Direction Finder Maintenance

7.1 Inspection

Inspect all components of the direction finder: display, antenna, and cables, for unusual wear and tear. If any parts are broken, missing or excessively worn, notify supervisor for ship's force repair or replacement.

7.2 Testing

- a. Ensure the direction finder is connected to power source and all breakers are on.
- b. Turn on display at power On/Off button if system is not already on.

NOTE: Ensure direct line of sight and a minimum distance of 10 feet between transmitter and antenna.

NOTE: Ensure bridge watchstanders are notified prior to activating transmitter.

- c. Activate MOBI transmitter.
- d. When signal is detected by direction finder, bearing indicator LED(s) will illuminate on display. Ensure illuminated bearing indicator LED correlates with actual bearing. Move transmitter to different bearing and ensure correlation again.
- e. Deactivate MOBI transmitter.

WARNING: Ensure appropriate ship's safety procedures for tag-out and man-aloft are followed, as applicable, prior to servicing antenna array. Failure to do so could result in injury or death to personnel and damage to equipment.

7.3 Antenna Element Replacement

- a. To replace a missing or broken antenna element, you will need the following materials:
- Brush
 - Wire
 - Disposable cleaning cloth
 - Solvent
 - Loctite or equivalent* Threadlock, MIL-S-46163A Ty II (Loctite 262)* - (provided with antenna element when replacement is ordered)

*Hazardous Material

WARNING: The following procedures involve the use of hazardous materials. Ensure all personnel are familiar with the hazards listed in the specific Material Safety Data Sheet (MSDS) and Personal Protective Equipment (PPE) guidance is followed.

- b. If antenna element is broken but still attached to the antenna housing, remove element.
- c. Ensure threaded antenna mount is free of debris and dried threadlock using wire brush. If necessary, to obtain complete removal of old threadlock, using PPE per MSDS, apply solvent in combination with wire brush. Using clean cloth, wipe all surfaces clean and dry.
- d. Using PPE per MSDS, place a few drops of threadlock on the threads of the antenna element mount.

CAUTION: Do not overtighten antenna element on mount. Over-tightening may cause cracks in housing.

- e. Immediately screw antenna element to mount; hand-tighten only. Wipe any excess threadlock from surrounding area.
- f. Repeat steps b through e above for each antenna element requiring installation/ replacement.

CAUTION: Do not overtighten antenna element on mount. Over-tightening may cause cracks in housing.

7.4 In-line Fuse Replacement

- a. Unscrew in-line fuse holder between power supply and DF display unit.
- b. Replace blown fuse with new fuse.
- c. Screw on fuse holder

7.5 Troubleshooting

Problem	Possible Cause(s)	Solution(s)
System does not turn on	“Power On” button is not pressed for required amount of time.	Press “Power On” button for at least one second
	Power surge	Ensure direction finder is plugged into energized power source. Inspect in-line fuse and replace fuse if blown
	Improperly assembled power cable	Check power cable for continuity
	System not energized	Verify breaker(s) and switch(es) are turned “ON”
	Water has penetrated the DF display housing	Check for corrosion on DB9 connectors on back of display. If corroded, contact manufacturer.
Display continuously points to the same bearing	An emitter from ownship or another ship is radiating at 121.5 MHz.	If possible, energize another DF to determine source of transmission.
	Damage to the cable jackets or leads	Check data cable for continuity. Inspect the entire length of the cable for cut/frayed wire(s).
	Water penetration in the antenna housing	Check for corrosion on DB9 connector at the base of the antenna. If corroded, contact manufacturer.
	DF-100 display is connected to DF-101 antenna	Replace DF-100 display with a DF-101 display
Indicator displays errant bearings	Antenna is not installed with correct orientation.	Orient antenna so arrow on housing is pointing forward. Ensure all elements are attached and secure.
	Interference from an emitter other than a MOBI transmitter.	Press the Squelch Increase button.

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7.5 Troubleshooting (continued)

Problem	Possible Cause(s)	Solution(s)
Indicator displays errant bearings	Multi-path: if the antenna is mounted adjacent to a large object, i.e. bulkhead, the signal from the transmitter may reflect off the surface of the object causing the display to indicate an errant bearing	If possible, mount the DF antenna in another location or maneuver vessel so signal is not reflecting off object
	Multiple transmitters are transmitting	Deactivate transmitters as appropriate
Numeric bearing indicator displays "232" and "485" alternately and/or Warning LED illuminated (communication error)	Data cable not connected	Inspect data cable connection at display and antenna array and ensure secure connection
	Damage to the data cable jacket or leads and/or improperly assembled cable	Check data cable for continuity
	Improperly assembled power cable	Check cable for continuity
	DF-100 antenna is connected to DF-101 display	Replace DF-100 antenna with a DF-101 antenna.
System is energized but no audio is heard when transmitter is activated	Speaker is disabled	Depress Speaker On/Off button until Speaker On/Off LED is extinguished
Display LEDs are difficult to read	Display is set to a low brightness setting	Press "Dim" button until display LEDs are sufficiently illuminated
System is energized but no bearing indication is displayed	Squelch setting is too high	Press Squelch Decrease button
	RF signal is too weak	Check that MOBI transmitter is properly installed on life vest

8.0 Parts List

System	Sub System	Part Number	NSN	Component Description (Nameplate Data)
MOBI	Direction Finder	ORCADF-101	5825-01-576-1572	Doppler Direction Finder: Includes relative bearing display (P/N: ORCADF-D101), antenna array with 5086 aluminum base (P/N: ORCADF-A101), rigid/flexible antenna elements – qty 8 (P/N: ORCADF-R/FANT1215), RCS compliant, 121.5 MHz, 12 or 24 VDC power requirement
MOBI	Direction Finder	ORCADF-A101	5985-01-576-1387	Antenna Array: Includes rigid/flexible antenna elements – qty 8 (P/N: ORCADF-R/FANT1215), 5086 aluminum base, RCS-compliant, 121.5 MHz
MOBI	Direction Finder	ORCADF-D101	5840-01-576-1584	Relative Bearing Display: Direction finder display unit with 360 degree LED bearing indicator
MOBI	Direction Finder	ORCADF-R/FANT1215	5985-01-576-1403	Antenna Element: Helical and rigid brass antenna element, overmolded with threaded connector for mounting on ORCADF-A101.
MOBI	Direction Finder	ORCADFB-H01	6625-01-576-2199	DF Display Hood: Polyurethane-coated nylon hood for DF display on small boat or other weather-exposed location, tether strap with grommet for mounting, plastic clip for quick release
MOBI	Direction Finder	ORCADF-SW100CU	5840-01-573-2124	Direction finder antenna switch box: AB switchbox for dual direction finder antenna array input, single DF display output, female DB9 connectors, rotary selector switch
MOBI	Direction Finder	ORCADFS-CKSER	TBD	Serial Cable Kit: Parts include 2X0-6 shielded serial cable, db9 connectors and heat shrink; for ship-mounted direction finder
MOBI	Direction Finder	ORCADFB-CKSER	TBD	Serial Cable Kit: Parts include 2X0-6 shielded serial cable, waterproof DB-9 connectors, cable clam, epoxy repair kit, heat shrink. For install on 7mRB, 7mRX, 7mRB 2002 OTECH, 11mPL, 36PL.
MOBI	Direction Finder	ORCADFB-CKSER5/11MRBO	TBD	Serial Cable Kit: Parts include 2X0-6 shielded serial cable, waterproof DB-9 connectors, cable clam, epoxy repair kit, heat shrink. For install on 5mRB, 11mRB open bow
MOBI	Direction Finder	ORCADFB-CKSER11MRBC	TBD	Serial Cable Kit: Includes all parts to assemble and run cable from DF antenna to display. Parts include 2X0-6 shielded serial cable, waterproof DB-9 connectors, cable clam, epoxy repair kit, heat shrink. For install on 11mRB closed cabin

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8.0 Parts List (continued)

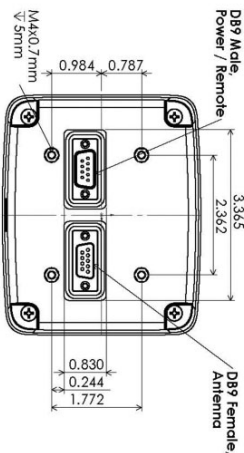
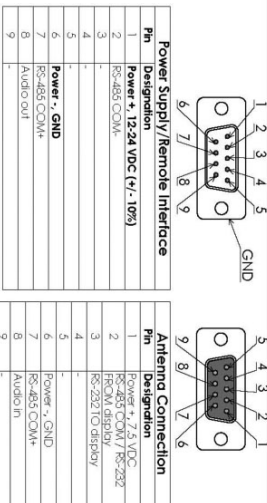
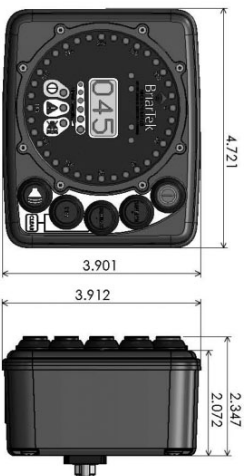
System	Sub System	Part Number	NSN	Component Description (Nameplate Data)
MOBI	Direction Finder	ORCADFB-CKDCLJE	TBD	DC Power Cable Kit: Includes all parts to assemble and run power cable from DF display to console outlet. Parts include: LS2SJ-20 cable, label plate, Waterproof DB-9 connector, Hella 4-pole socket & plug connector, epoxy repair kit, heat shrink and fasteners. For install on 7mRB (2003 and older), 7mRX (2004 and older), 7mRB OTECH (2004 and older), 11mPL, 36PL.
MOBI	Direction Finder	ORCADFB-CKDCL3	TBD	DC Power Cable Kit: Includes all parts to assemble and run cable from console outlet to power source. Parts include: LSDSGU cable, 3AG 250V 1A fuse and in-line fuse holder, heat shrink, label plate, HD ring terminal, Hella power socket, cable tags, cable strap, screws, nuts, washers, epoxy repair kit. For install on 7mRB (2003 and older), 7mRX (2004 and older), 7mRB OTECH (2004 and older), 11mPL, 36PL.
MOBI	Direction Finder	ORCADFB-CKDC11MRBC	TBD	DC Power Cable Kit: Includes all parts to assemble and run cable from display to PDM. Parts include: LS2SJ-20 cable, heat shrink, label plate, labeling heat shrink, cable tags, cable straps, screw, washers, nuts, cable ties, epoxy repair kit, roovers tape, DB9 female connector, DB9 hood, DB9 hood gasket, DB9 hood assembly tool, cable clam; circuit breaker. For install on 11mRB closed cabin.
MOBI	Direction Finder	ORCADFB-CKDC11MRBO	TBD	DC Power Cable Kit: Includes all parts to assemble and run cable from display to PDM. Parts include: LS2SJ-20 cable, label plates, heat shrink, cable tags and straps, screws, bolts, epoxy, roovers tape, cable ties, DB9 hood, gasket, cable clam, circuit breaker. For install on 11mRB open.
MOBI	Direction Finder	ORCADFB-CKDC5MRB	TBD	DC Power Cable Kit: Includes all parts to assemble and run cable from display to power panel. Parts include: LS2SJ-20 cable, red/black 16AWG wire, Label Plates, Heat Shrink, Cable tags and straps, screws, bolts, epoxy, roovers tape, cable ties, DB9 hood, gasket, cable clam, Circuit Breaker, epoxy repair kit. . For install on 5mRB.
MOBI	Direction Finder	ORCADFB-CKDC7/11MRBCH	TBD	DC Power Cable Kit: Includes all parts to assemble and run cable from display to PDM. Parts include: LS2SJ-20 cable, heat shrink, label plate, labeling heat shrink, cable tags, cable straps, screw, washers, nuts, cable ties, epoxy repair kit, roovers tape, DB9 female connector, DB9 hood, DB9 hood gasket, DB9 hood assembly tool, cable clam. For install on 7mRB 2004 and newer and 11mRX.

9.0 DF-101 Specifications

System	MOBI
Sub System	Direction Finder
Part Number	ORCAD-F-D101
Description	Direction Finder Display

SPECS:

- Relative bearing display
- LED illumination
- Overall weight: 11.6 oz (329 g)
- Operating frequency: 121.5 MHz
- Operating voltage: 12-24 VDC (+/- 10%)
- Current draw: max350 mA
- Accuracy: +/5°
- Operating Temperature range: -20°C (-4 °F) +60°C (140 ° F)
- Storage Temperature: -50°C (-58° F) +70°C (158° F)
- Weatherproof applications require DB9 connectors with waterproof hood (Conec P/N: 165X15019X) and extended gasket (Conec P/N: 795-305420).



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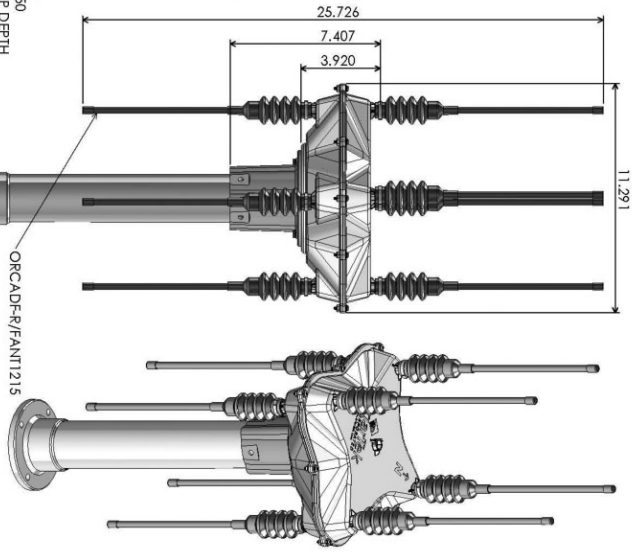
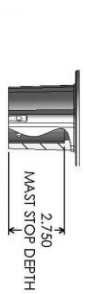
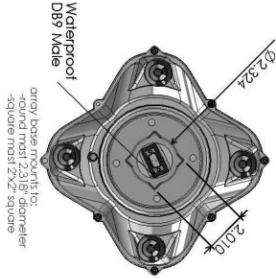
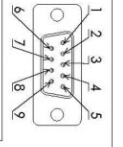
9.0 DF-101 Specifications

Sub System	Direction Finder
Part Number	ORCAD-F-A101
Description	Direction Finder Antenna

- SPECS:**
- Operating Frequency: 121.5 MHz
 - Operating Voltage: 7-12 VDC (powered via display)
 - Current Draw: max 350 mA
 - Weight: 68.7 oz (19.49 g)
 - Accuracy: ±5°
 - Operating Temperature Range: -20°C (-4°F) to +40°C (104°F)
 - Storage Temperature: -50°C (-58°F) to +70°C (158°F)
 - Weatherproof applications require D89 connector with waterproof hood (Conec P/N: 1.65X15019X) and extended gasket (Conec P/N: 795-305420)

Antenna Connection

1	Power - 7.5 VDC
2	Shield
3	SP222 TO DISPLAY
4	
5	Power - GND
6	IS-468 COAX
7	IS-468 COAX
8	Audio In
9	



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NAME	DATE	DRAWN	CHECKED	DATE
DIMENSIONAL PART IN INCHES		SCALE		
TOLERANCES: ±0.005		DATE		
MATERIAL		BY		
FINISH		APP'D		
APPROVAL	USED ON	COMMENTS		
DO NOT SCALE DRAWING		ORCAD-F-A101		
		BRARTEK, Inc.		
REV.	DATE	SHEET 001		
		SCALE: 1" = 1" WGSUR		

10.0 Warranty

BriarTek will provide a one-year warranty on the ORCA® MOBI system following the date the component is put into service.

If a component fails to function properly during its warranty period (one year), the manufacturer will proceed according to its warranty as follows:

BriarTek Inc. guarantees each product it distributes to be free from defective materials and workmanship and agrees to remedy any such defect, or to furnish a new or equal part in exchange (at its option) for a period of one year from the date the component is purchased. For an exchange of the product, please contact BriarTek at 703-548-7892 or on the web at www.briartek.com and a customer service representative will provide the necessary instructions.

This warranty is void if:

- any component has been subject to misuse or improper installation by a non-BriarTek employee or a non-BriarTek certified technician, or has been repaired or altered by a non-BriarTek employee or a non-BriarTek certified technician.
- any component fails to function properly after being put into service due to something other than defective materials or workmanship, i.e. excessive temperature, humidity or shock while component is in storage.



www.briartek.com

San Diego, California | Alexandria, Virginia | Indianapolis, Indiana
Technical Support: 703.548.7892