FURUNO

INSTALLATION MANUAL

MARINE RADAR

MODEL

MODEL 1722/1732/1742/1752/1762
MODEL 1722C/1732C/1742C/1752C/1762C
MODEL 1723C/1733C/1753C/1763C

NAVnet

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(TENI) MODEL1722/C SER.

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IME34940H00

⚠ SAFETY INSTRUCTIONS

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Do not open the equipment unless totally familiar with electrical circuits and service manual.

Only qualified personnel should work inside the equipment.

Wear a safety belt and hard hat when working on the antenna unit.

Serious injury or death can result if someone falls from the radar mast.

Construct a suitable service platform from which to install the antenna unit.

Serious injury or death can result if someone falls from the radar mast.

Turn off the power at the mains switchboard before beginning the installation.

Fire, electrical shock or serious injury can result if the power is left on or is applied while the equipment is being installed.

⚠ CAUTION

Ground the equipment to prevent electrical shock and mutual interference.

Observe the following compass safe distances to prevent deviation of a magnetic compass.

	Standard	Steering
1722/C series Display unit	0.65 m	0.45 m
1723C series Display unit	0.55 m	0.35 m
1723C antenna	1.30 m	0.80 m
1722/1722C antenna unit	1.25 m	0.85 m
1732/1732C/1733C antenna	0.90 m	0.70 m
1742/C antenna	2.10 m	1.60 m
1752/1752C/1753C antenna	1.50 m	1.00 m
1762/1762C/1763C antenna	1.00 m	0.80 m

⚠ WARNING

Radio Frequency Radiation Hazard

The radar antenna emits electromagnetic radio frequency (RF) energy which can be harmful, particularly to your eyes. Never look directly into the antenna aperture from a close distance while the radar is in operation or expose yourself to the transmitting antenna at a close distance.

Distances at which RF radiation levels of 100 and 10 W/m^2 exist are given in the table below.

Note: If the antenna unit is installed at a close distance in front of the wheel house, your administration may require halt of transmission within a certain sector of antenna revolution. This is possible - Ask your FURUNO representative or dealer to provide this feature.

MODEL	Distance to 100 W/m^2 point	Distance to 10 W/m^2 point
1722/ 1722C/ 1723C	Nil	Worst case 0.50 m
1732/ 1732C/ 1733C	Nil	Worst case 0.50 m
1742/1742C	Nil	Worst case 1.00 m
1752/ 1752C/ 1753C	0.15 m	Worst case 2.00 m
1762/ 1762C/ 1763C	0.20 m	Worst case 3.00 m

TABLE OF CONTENTS

EQUIPMENT LISTS

Standard supply

Name	Type	Code No.	Qty	Remarks
Display unit	RDP-130	-	1	For monochrome model
	RDP-131	-		For color model (QVGA)
	RDP-143	-		For color monitor (VGA)
Antenna unit	RSB-0087A-070	-	1	For MODEL1722/1722C
	RSB-110-070-A	-	1	For MODEL1723C
	RSB-0071-058	-	1	For MODEL1732/1732C/1733C
	XN065AF-RSB-0047-051	-	1	For MODEL1742/1742C
	XN10A-RSB-0070-065	-	1	For MODEL1762/1762C/1763C
	XN065BF-RSB-0091-069	-	1	For MODEL1752/1752C/1753C
Remote controller set	RMC-100	000-089-885	1	Remote controller, vinyl case, battery, labels
Installation materials	CP03-22200	000-089-887	1	For display unit, power cable, CP03-22201
	CP03-20301	008-440-670	1	For MODEL1722/1722C/1723C, antenna unit
	CP03-22100	000-089-848	1	For MODEL1722/1722C/1723C, 5 m signal cable
	CP03-22110	000-089-849		For MODEL1722/1722C/1723C, 10 m signal cable
	CP03-22120	000-089-850		For MODEL1722/1722C/1723C, 15 m signal cable
	CP03-22130	000-089-851		For MODEL1722/1722C/1723C, 20 m signal cable
	CP03-22140	000-089-852		For MODEL1722/1722C/1723C, 30 m signal cable
	CP03-18001	008-478-740	1	For MODEL1732/1732C/1733C, antenna unit
	CP03-22300	000-089-888	1	For MODEL1732/1732C/1733C, 10 m signal cable
	CP03-22310	000-089-889		For MODEL1732/1732C/1733C, 15 m signal cable
	CP03-22320	000-089-900		For MODEL1732/1732C/1733C, 20 m signal cable
	CP03-22330	000-089-914		For MODEL1732/1732C/1733C, 30 m signal cable
	CP03-22081	008-522-980	1	For MODEL1742/1742C, antenna unit
	CP03-24001	008-526-180	1	For MODEL1752/1752C/1753C, antenna unit
	CP03-22400	000-089-915	1	MODEL1742/1742C/1752/1752C/ 1753C, 10 m signal cable
	CP03-22410	000-089-916		MODEL1742/1742C/1752/1752C/ 1753C, 15 m signal cable
	CP03-22420	000-089-917		MODEL1742/1742C/1752/1752C/ 1753C, 20 m signal cable
	CP03-22430	000-089-918		MODEL1742/1742C/1752/1752C/ 1753C, 30 m signal cable

Name	Type	Code no.	Qty	Remarks
Installation materials	CP03-18401	008-503-360	1	For MODEL1762/1762C/ 1763C, antenna unit
	CP03-22901	008-523-690	1	For MODEL1762/1762C/ 1763C, antenna radiator, XN10A
	CP03-22500	000-089-919	1	For MODEL1762/1762C/1763C, 10 m signal cable
	CP03-22510	000-089-920	1	For MODEL1762/1762C/1763C, 15 m signal cable
	CP03-22520	000-089-949	1	For MODEL1762/1762C/1763C, 20 m signal cable
	CP03-22530	000-089-951	1	For MODEL1762/1762C/1763C, 30 m signal cable
Accessories	FP03-09301	008-522-970	1	Card remover
Spare parts	SP03-13801	000-089-886	1	Fuses

Optional supply

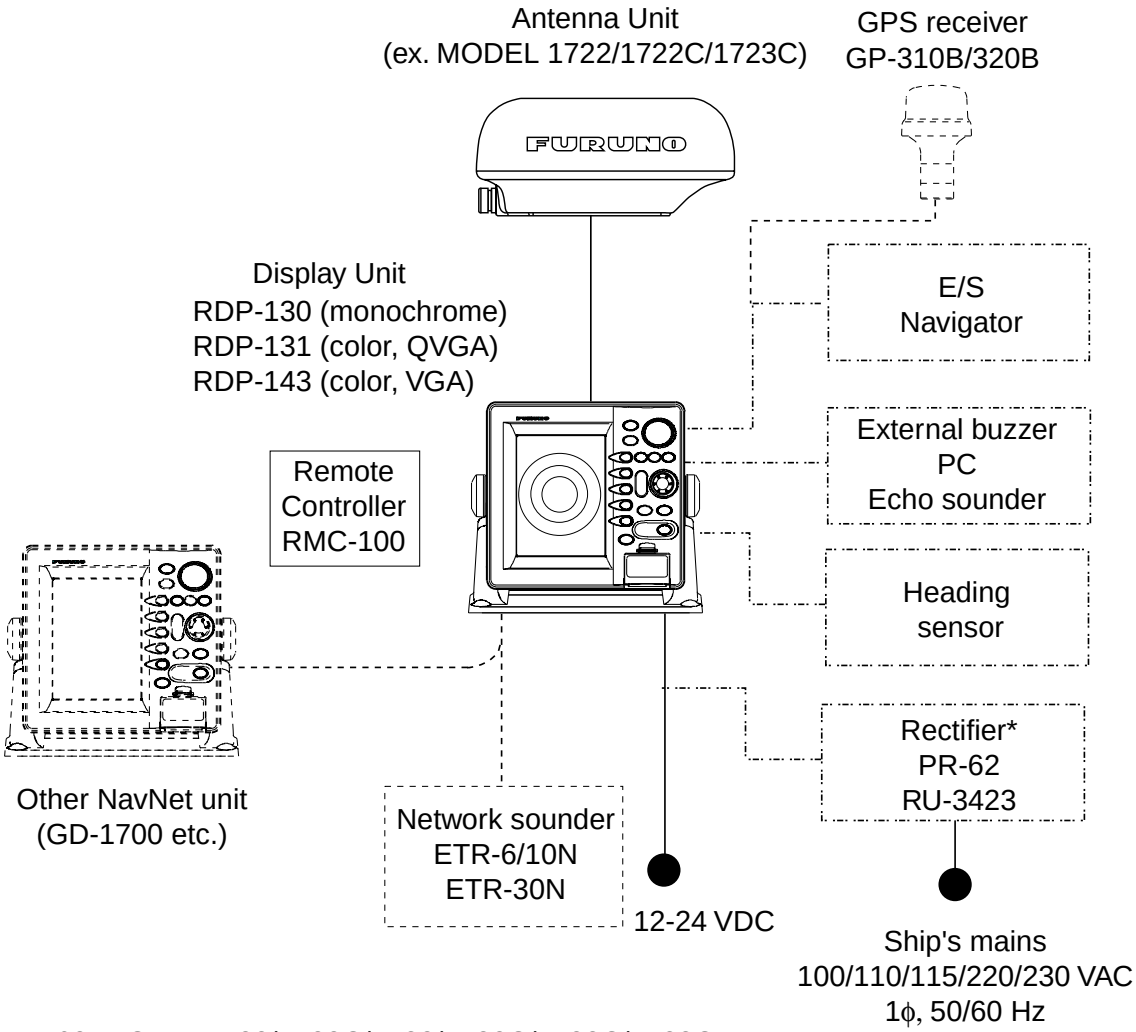
Name	Type	Code No.	Qty	Remarks	
Rectifier	RU-3423	000-030-443	1	1742/1742C/1752/1752C/ 1762/1762C/1753C/1763C	
	PR-62	000-013-484	1	1722/1722C/ 1732/1732C 1723C/1733C	100 VAC
		000-013-485			110 VAC
		000-013-486			220 VAC
		000-013-487			230 VAC
External buzzer	OP03-136	000-086-443	1		
Cable assy	MJ-A6SPF0014-010	000-144-421	1	1 m, for NavNet	
	MJ-A6SPF0014-050	000-144-422	1	5 m, for NavNet	
	MJ-A6SPF0014-100	000-144-423	1	10 m, for NavNet	
	MJ-A6SPF0014-200	000-144-424	1	20 m, for NavNet	
	MJ-A6SPF0014-300	000-144-425	1	30 m, for NavNet	
	MJ-A6SPF0012-050	000-134-424	1	For Navaid	
	MJ-A6SPF0012-100	000-133-817	1	For Navaid	
	MJ-A6SPF0003-050	000-117-603	1	w/6p connector, 5 m	
	MJ-A6SPF0009-100	000-125-236	1	w/6p connector, 10 m	
	MJ-A7SPF0007-050	000-144-418	1	w/7P connector, for external buzzer, PC, NMEA	
	MJ-A6SPF0007-100	000-125-237	1	For compass, 10 m	
	MJ-A6SRMD/TM11AP8-005	000-144-463	1	Adapter cable for HUB	
Mounting bracket (1)	OP03-92	008-445-070	1	For MODEL1732/1732C/1733C	
Mounting bracket (2)	OP03-93	008-445-080	1	For MODEL1722/1722C/1723C	
RAM card	00RAM02MC-004	004-371-790	1	2 MB	
Chart card	-	-	-	Specified when ordering.	
Remote controller set	RMC-100	000-089-885	1		
Modification Kit for C-map	MODEL 17*2/C-MAP	008-525-200	1	See modification instruction. E42-00005-x	

SYSTEM CONFIGURATIONS

All NavNet products incorporate a “network circuit board” to integrate each NavNet product on board through an optional LAN cable (Ethernet 10BASE-T). Each NavNet product is assigned an IP address to enable transfer of images between other NavNet products. For example, video plotter pictures can be transferred to a radar and vice versa. Pictures received via the NavNet may be adjusted at the receiving end.

The number of display units which may be installed depends on the number of network sounder connected. For a system incorporating three or more products, a “hub” is required to process data.

For one network sounder: one radar and three plotters
For two network sounder: one radar and two plotters



*PR-62: MODEL1722/1722C/1732/1732C/1723C/1733C
RU-3423: MODEL1742/1742C/1752/1752C/1762/1762C/1753C/1763C

Figure 1 NavNet system

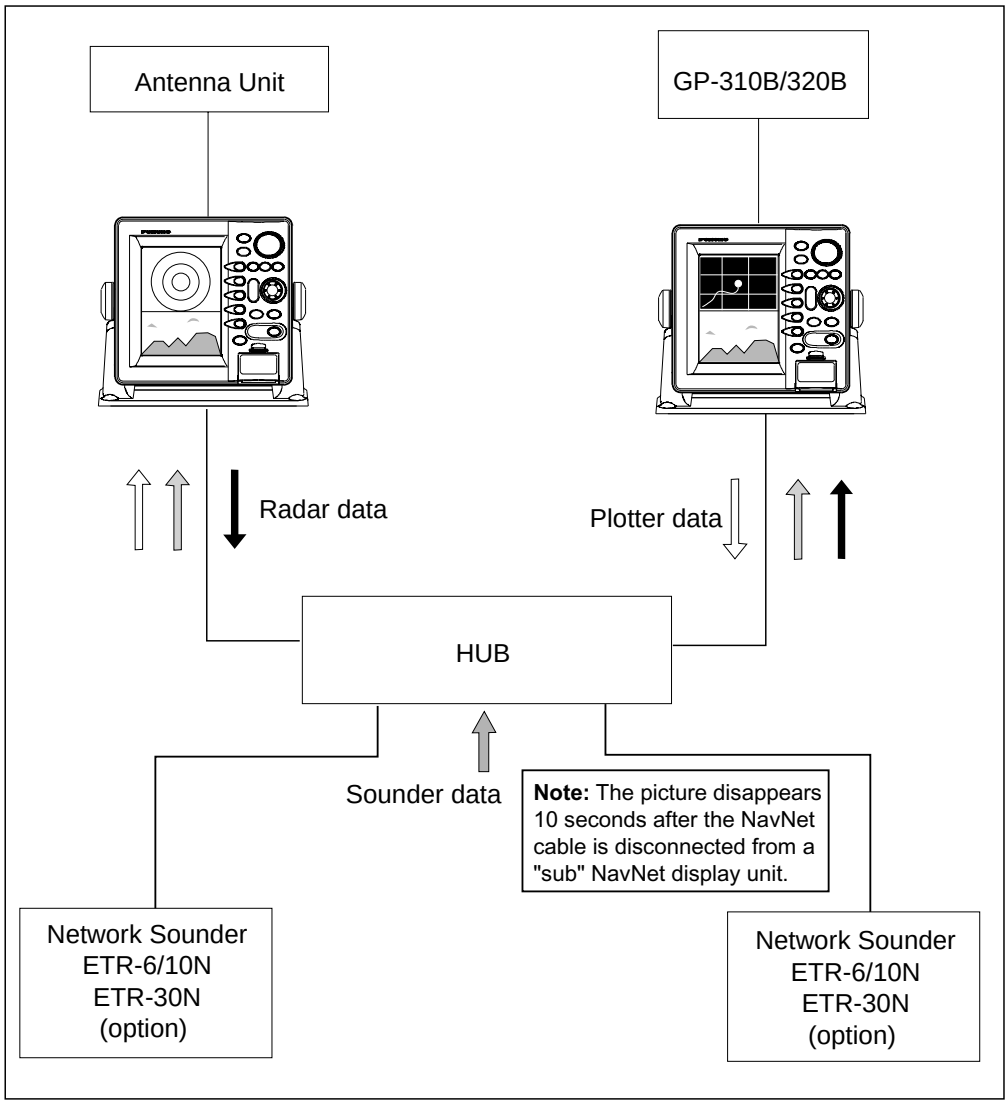


Figure 2 (a) NavNet system, three-unit connection

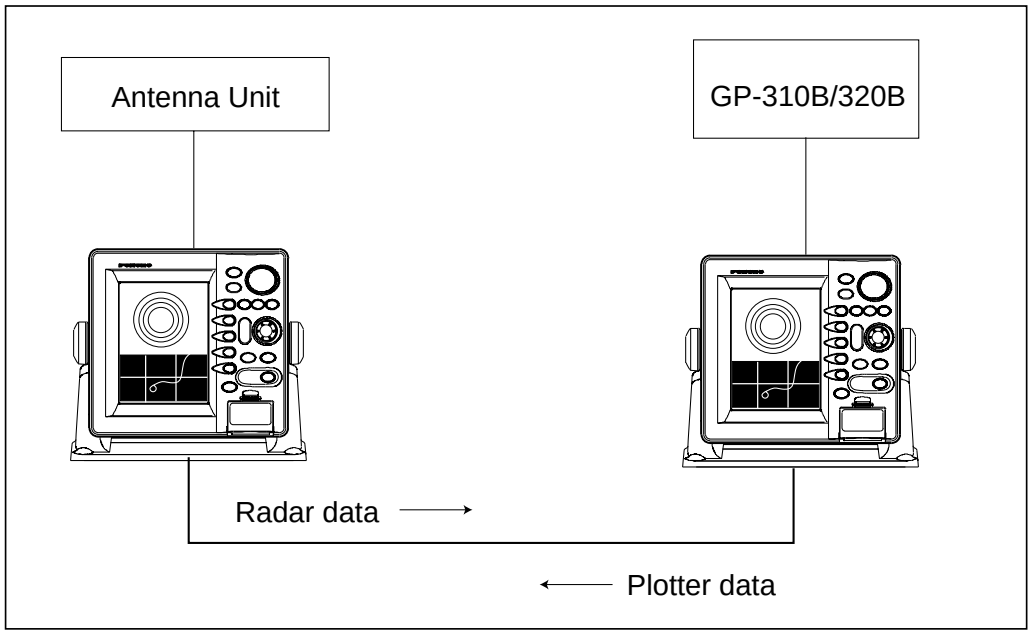
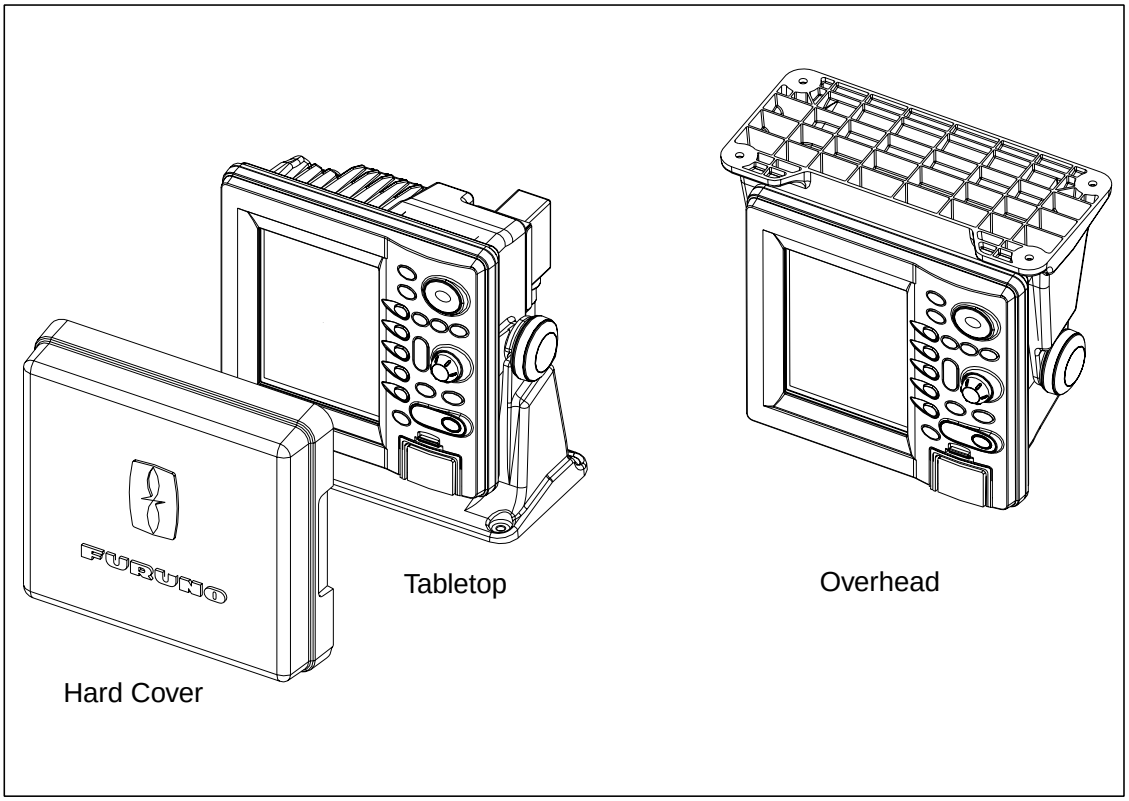


Figure 2 (b) NavNet system, two-unit connection

1. MOUNTING

1.1 Installation of Display Unit

The display unit can be installed on a tabletop, on the overhead or flush mounted in a console or panel.



Tabletop, overhead mounting method

When selecting a mounting location for the display unit keep the following in mind:

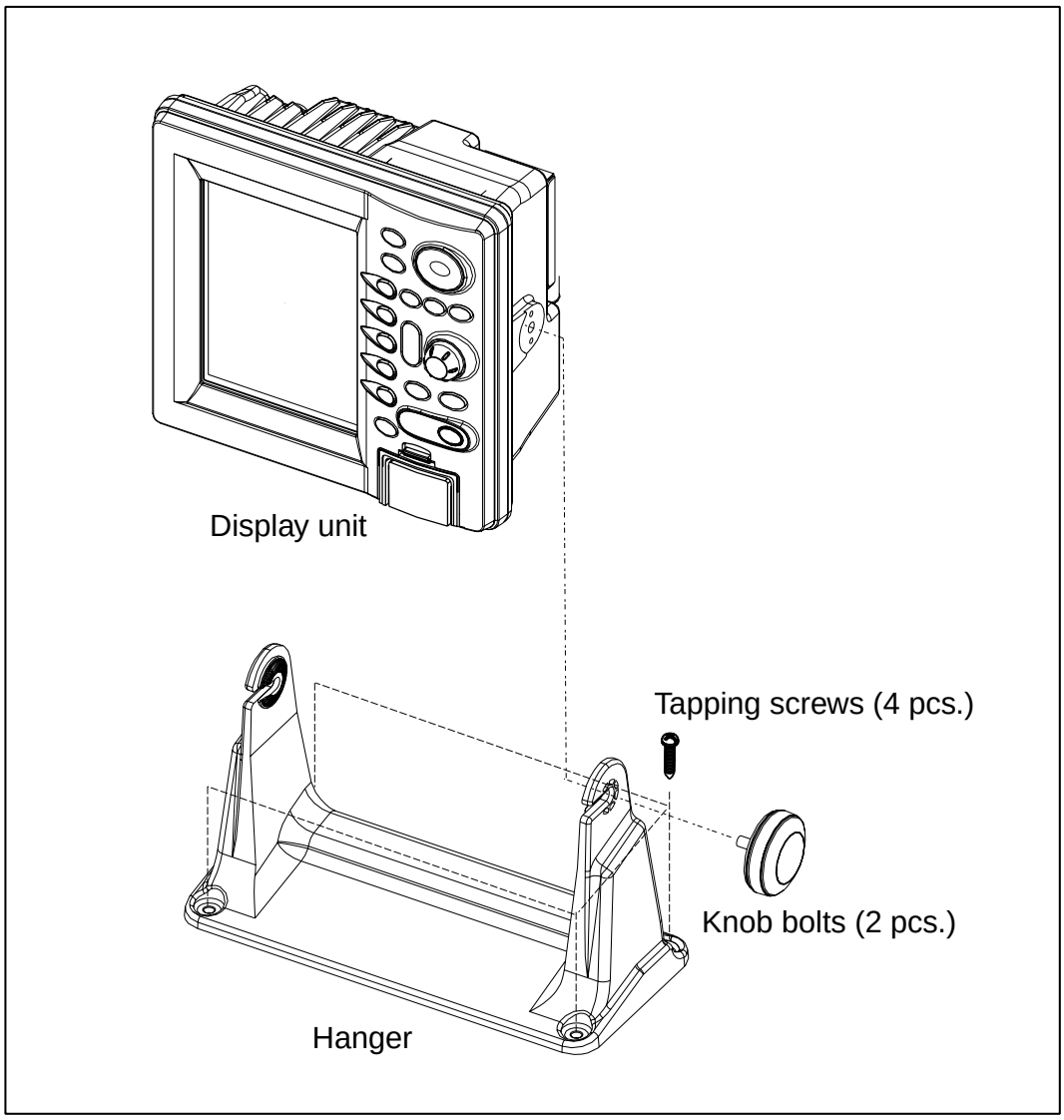
- Keep the display unit out of direct sunlight.
- The temperature and humidity should be moderate and stable.
- Locate the unit away from exhaust pipes and vents.
- The mounting location should be well ventilated.
- Mount the unit where shock and vibration are minimal.
- Keep the unit away electromagnetic field generating equipment such as motor, generator.
- For maintenance and checking purposes, leave sufficient space at the sides and rear of the unit and leave slack in cables.
- A magnetic compass will be affected if the display unit is placed too close to the magnetic compass. Observe the compass safe distances to prevent disturbance to the magnetic compass; standard: 0.65 m, steering: 0.45 m.

1.1.1 Mounting procedure

Tabletop, overhead mounting

Follow the procedure below to mount the display unit on a tabletop or the overhead.

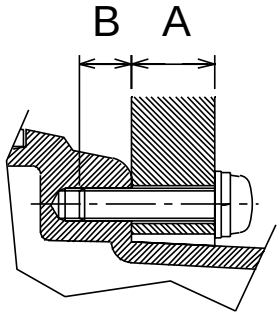
1. Fix the hanger by four tapping screw.
2. Screw knob bolts in display unit, set it to hanger, and tighten knob bolts.
3. Attach hard cover to protect LCD.



Tabletop, overhead mounting of display unit

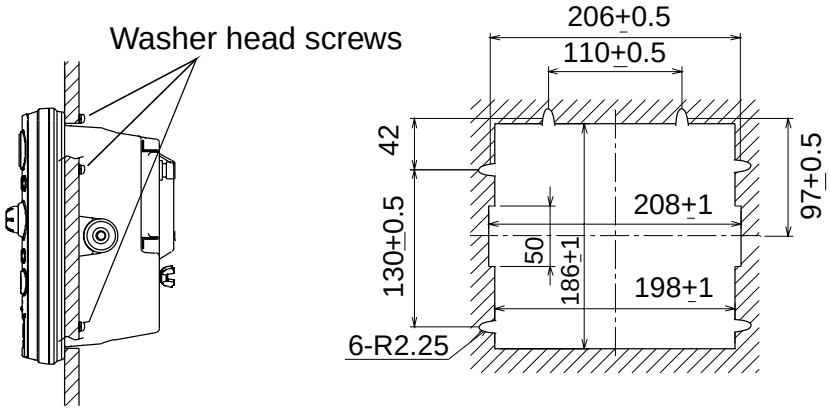
Flush mounting

Note: Use supplied pan head screws when the thickness of the bulkhead is from 11 to 14 mm. For bulkhead which exceeds 14 mm in thickness the length of the pan head screws should be bulkhead thickness (A) plus 7.3±1.5 mm. Also the length of B should be max. 7 mm.



Fixing screw, side view

1. Prepare a cutout in the mounting location whose dimensions are as shown in below.
2. Fix the display unit by six washer head screws M4x20. Refer to the outline drawing at back of this manual.



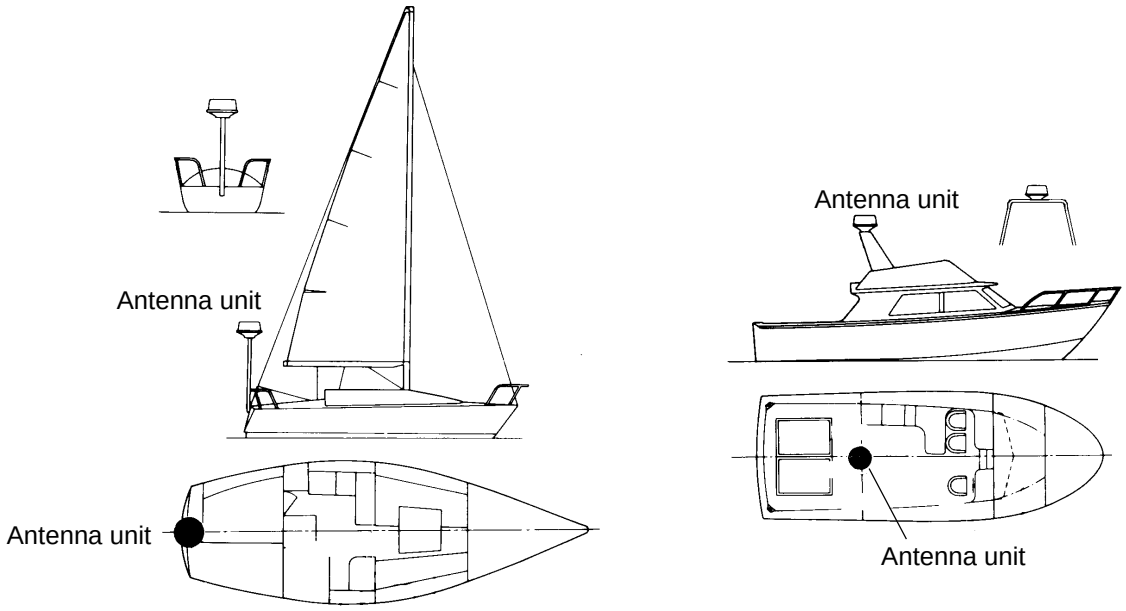
Flush mounting of display unit

1.2 Mounting of Antenna Unit for MODEL 1722/1722C/1732/1732C/1723C/1733C

1.2.1 Mounting considerations

When selecting a mounting location for the antenna unit keep in mind the following points.

- Install the antenna unit on the hardtop, radar arch or on a mast on an appropriate platform. (For sailboats, a mounting bracket is optionally available.) It should be placed where there is a good all-round view with, as far as possible, no part of the ship's superstructure or rigging intercepting the scanning beam. Any obstruction will cause shadow and blind sectors. A mast, for instance, with a diameter considerably less than the width of the antenna unit, will cause only a small blind sector. However, a horizontal spreader or crosstrees in the same horizontal plane would be a much more serious obstruction; place the antenna unit well above or below it.

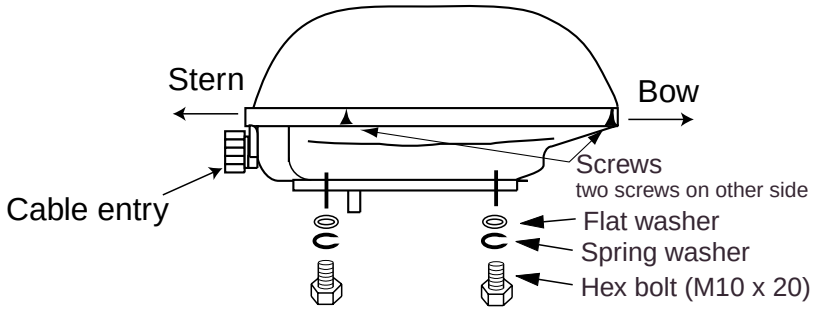


Typical antenna unit placement on sailboat and powerboat

- In order to minimize the chance of picking up electrical interference, avoid where possible routing the antenna cable near other electrical equipment onboard. Also avoid running the cable in parallel with power cables.
- The compass safe distance of 1.25 (1722/1722C/1723C), 0.9 (1732/1732C/1733C) meters (standard compass) and 0.85 (1722/1722C/1723C), 0.7 (1732/1732C/1733C) meters (steering compass) should be observed to prevent deviation of the magnetic compass.

1.2.2 Mounting antenna unit of MODEL 1722/1722C/1723C

1. Remove mounting hardware at the bottom of the antenna unit; four each of hex bolts (M10X20), spring washers and flat washers. Save mounting hardware to use it to fix the antenna unit to the mounting platform later on.



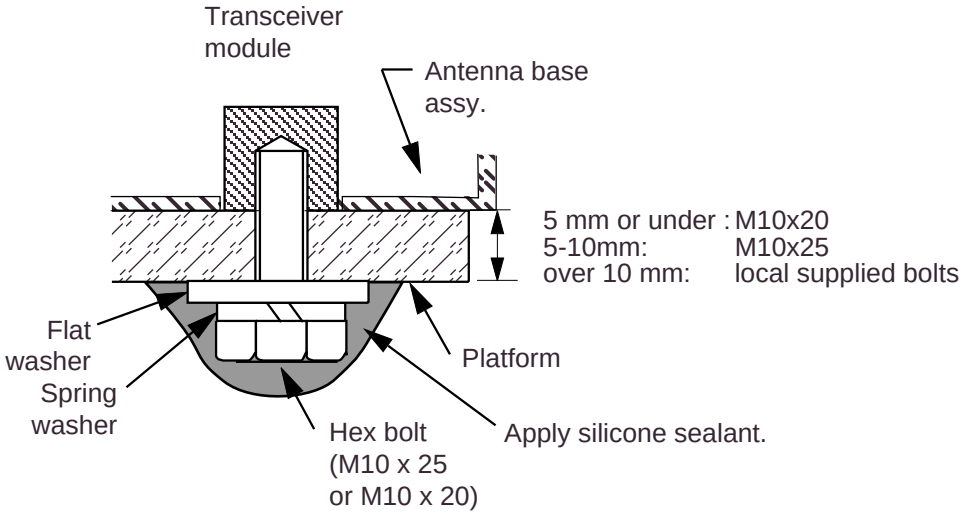
Antenna unit, showing location of mounting hardware

2. Construct a platform (wood, steel, or aluminum) of 5-10 mm in thickness referring to the outline drawing at back of this manual. A mounting bracket for mounting the antenna unit on a sailboat mast is optionally available. (Refer to page 1-14.) Fasten the platform to the mounting location. Next, position the base so the cable entrance faces the stern direction.

Note: When drilling holes in the platform, be sure they are parallel with the fore and aft line.

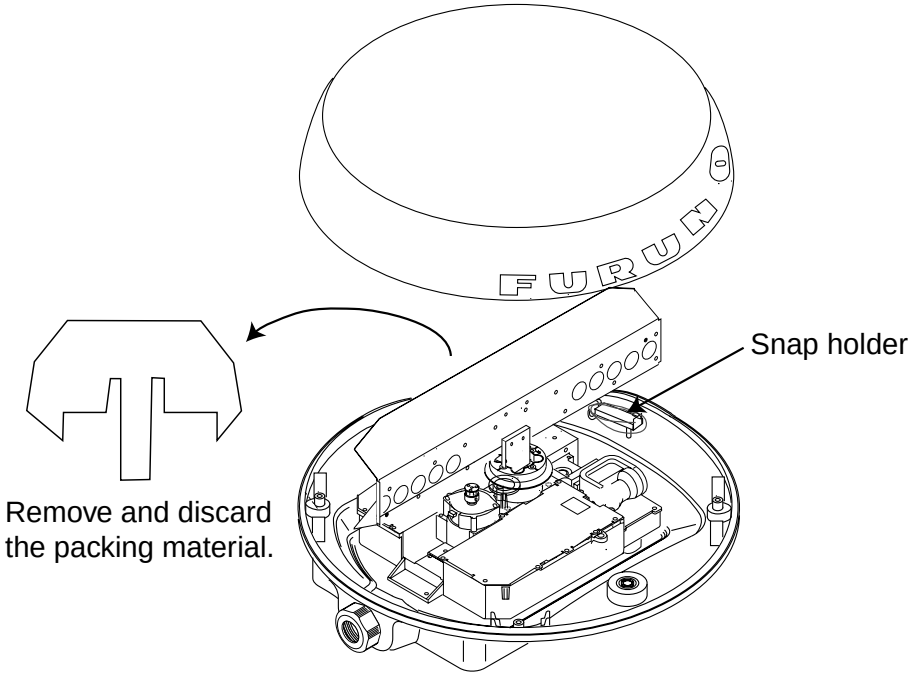
3. Using the hex bolts, flat washers and spring washers removed at step 1, fasten the base to the platform. **The torque should be between 19.6-24.5 N•m.**

Note: Longer hex bolts (M10X25) are supplied with the installation materials. Use them instead of the hex bolts removed earlier if the mounting platform thickness is 5–10 mm.



How to fasten the base to platform

4. Unfasten four screws to remove the cover. Discard the packing material in the radome.



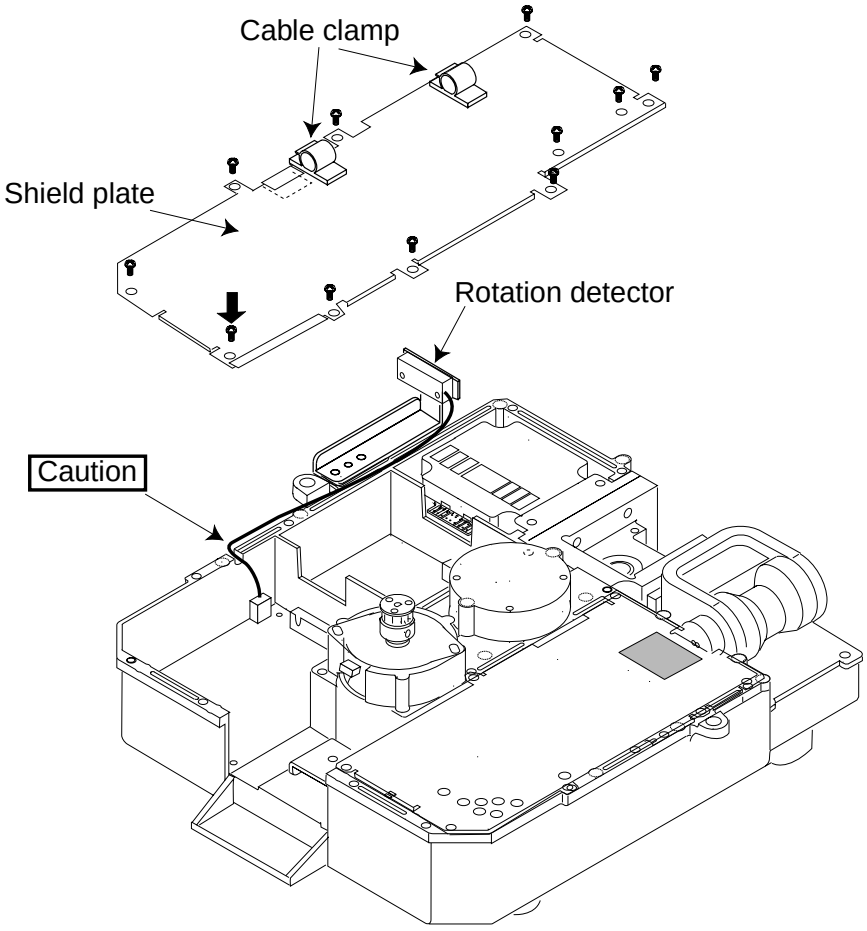
Antenna unit, inside view

The mounting base is fitted with a snap holder, which may be used to hang the cover after removal. Use the hole next to screw hole inside the cover to hang it.

a) Unfasten the snap assy. with the string attached at the holder in the mounting base.
b) Unwind the string.
c) Attach the snap to a screw hole on the inside of the cover.

Note: Do not hang any other objects with the snap.

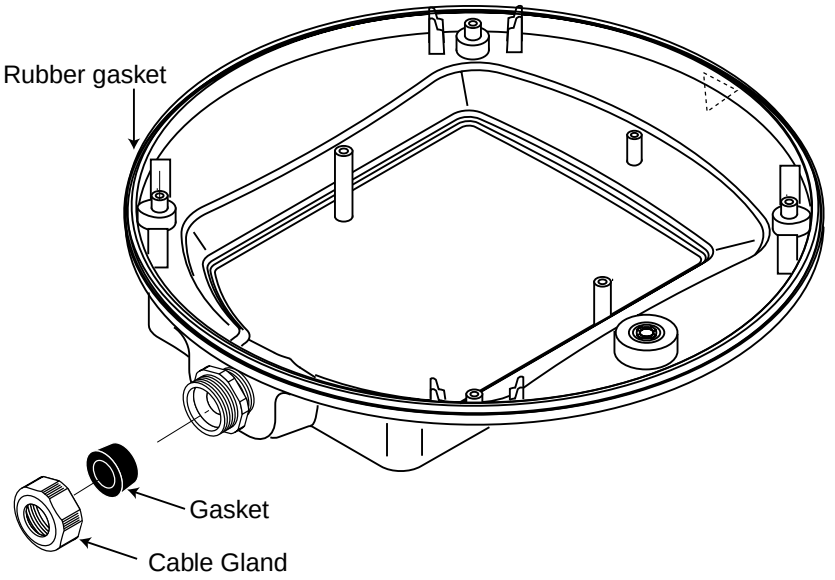
5. Unfasten the cable of the rotation detector from the cable clamps.
6. Unfasten 11 screws to dismount the shield plate. Discard screw marked with ⬇ in the figure shown below.



Antenna unit, inside view

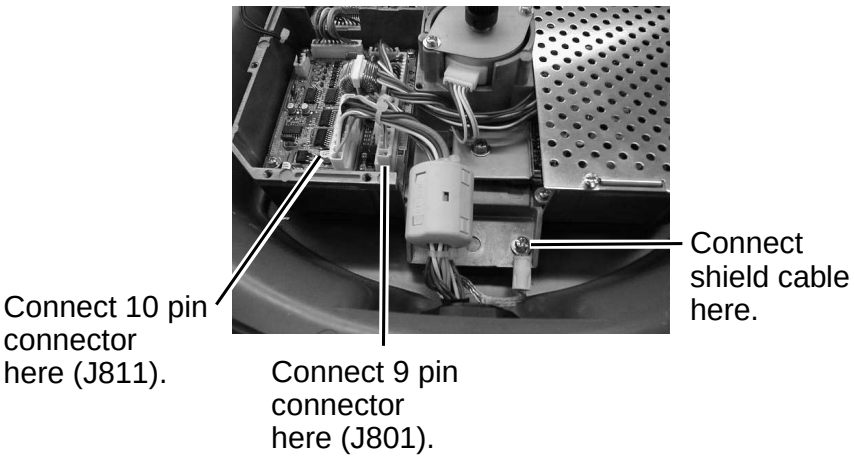
Caution: Be careful not to pinch the rotation detector cable when remounting the shield plate.

7. Pass the antenna cable with connector through the gasket and cable clamp, and then tighten cable gland.
   Be sure the shrink tubing on the antenna cable is not covered by the gasket.



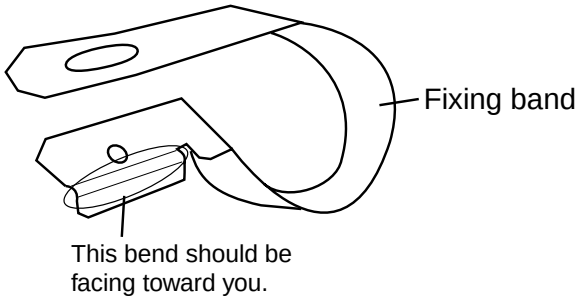
Antenna unit, inside view

8. Referring to the figure shown below, fasten the shield cable with screw (M4x10) on the chassis to ground the unit.



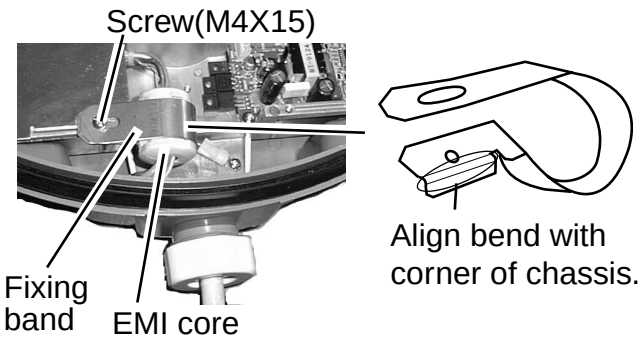
How to connect the antenna cable to the antenna unit

9. Attach EMI core (supplied) to antenna cable between cable ties. Set the fixing band to the EMI core.



Fixing band

10. Referring to the figure of "How to connect the antenna cable to the antenna Unit" on the previous page connect the 9-pin (J801) and 10-pin (J811) connectors of the antenna cable to the INT Board.
11. Refasten the shield plate with 10 screws. Be sure not to pinch cable from the rotation detector with the shield plate. See "Caution" in the figure of "Antenna unit, inside view" on page 1-7, for details.
12. Fasten the fixing band with screw (M4X15; supplied).

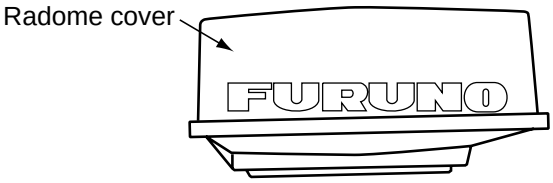


How to fix the EMI core

13. Follow the instructions on the label inside the mounting base to secure the snap assy.
14. Confirm that the rubber gasket is properly positioned and that the triangle mark on the radome cover is aligned with the triangle mark on the mounting base, then tighten the fixing screws for the cover. Refer to the figure of sectional view on the previous page for positioning of rubber gasket.

1.2.3 Mounting antenna unit of MODEL 1732/1732C/1733C

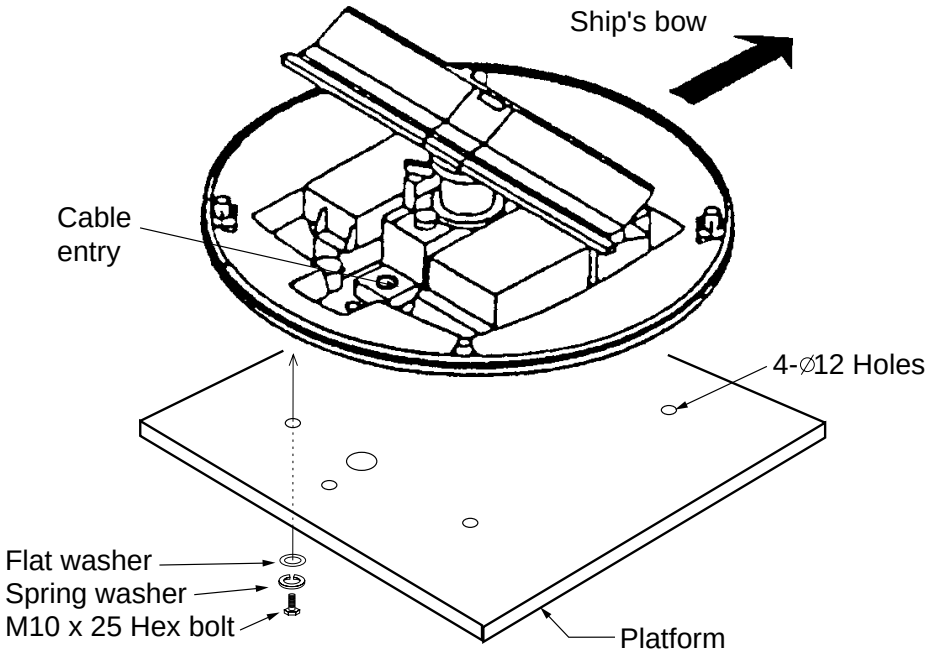
1. Open the antenna unit packing box carefully.
2. Unbolt the four bolts at the base of the radome to remove the radome cover.



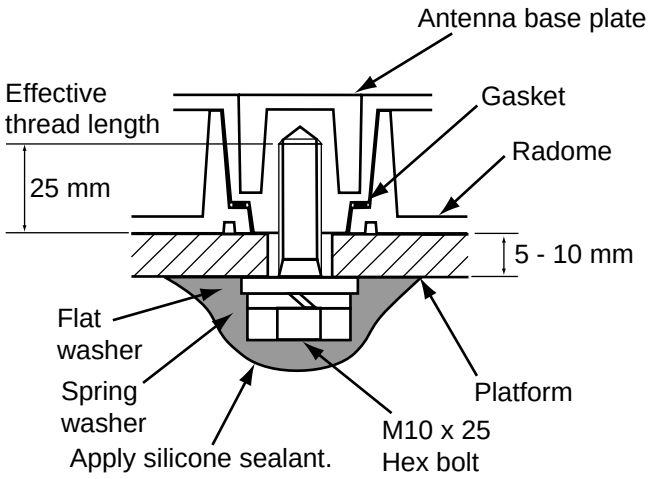
Antenna unit

The mounting surface must be parallel with the waterline and provided with five holes (four fixing holes and one cable ently) whose dimensions are shown in the outline drawing attached at the end of this manual.
The unit is adjusted so a target echo returned from the bow direction will be shown on the zero degree (heading line) position on the screen. When drilling holes, be sure they are parallel with the fore and aft line.

3. Prepare a platform of 5 to 10 millimeters in thickness for the antenna unit.
   A mounting bracket for mounting the antenna unit on a sailboat mast is optionally available. (Refer to page 1-14.) Find the cable entry on the radome base. Next, position the radome base so the cable entry faces the stern direction. This alignment must be as accurate as possible.



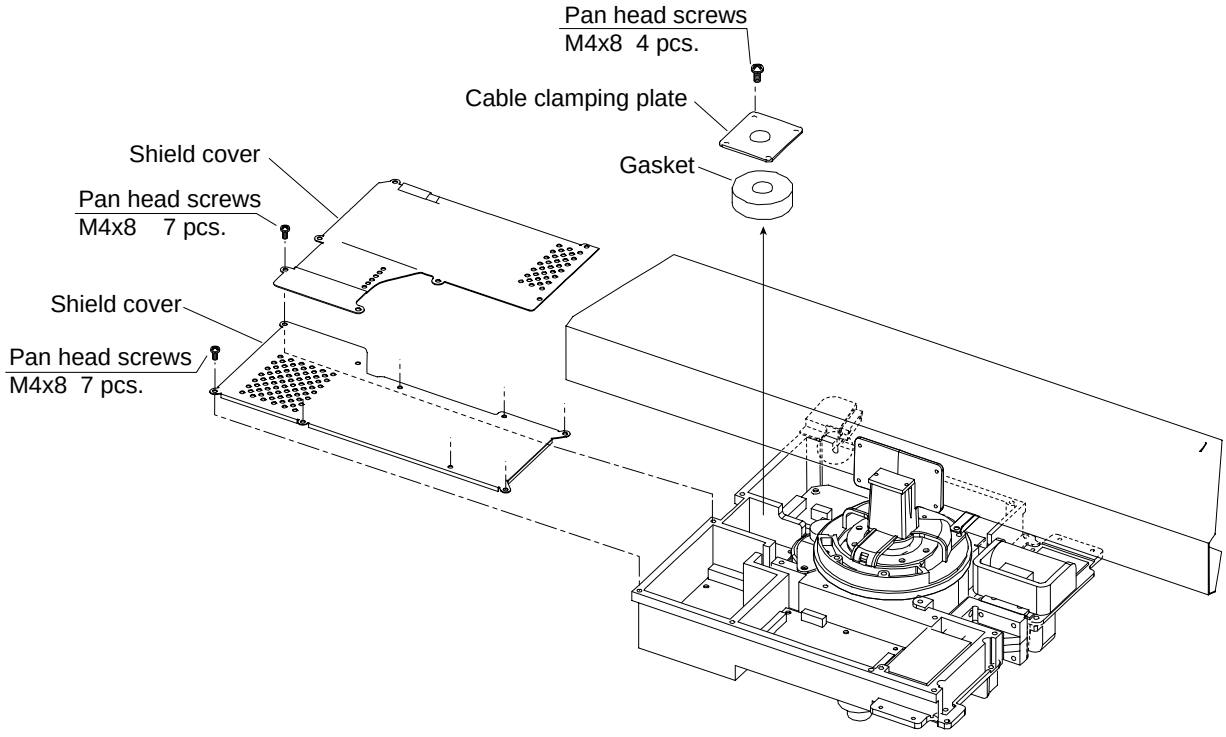
Antenna unit, cover removed



How to fasten the radome base to the mounting platform

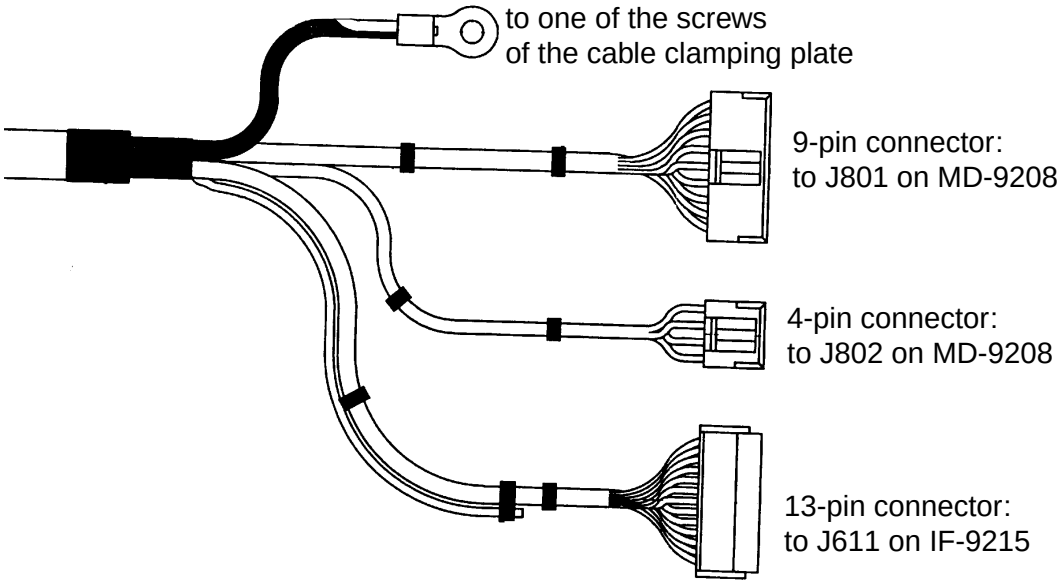
Wiring and final preparation

4. Drill a hole of at least 20 millimeters diameter through the deck or bulkhead to run the signal cable between the antenna unit and the display unit. (To prevent electrical interference avoid running the signal cable near other electrical equipment and in parallel with power cables.) Pass the cable through the hole. Then, seal the hole with sealing compound for waterproofing.
5. Remove two shield covers in the radome.
6. Remove the cable clamping plate by unfastening four screws and removing a gasket.

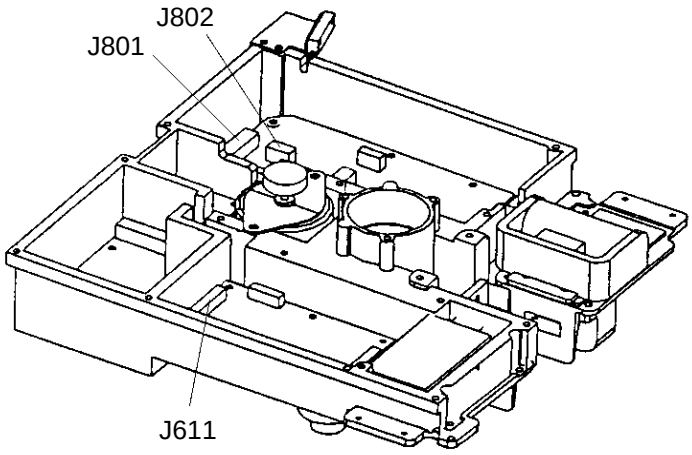


Antenna unit, inside view

7. Pass the cable through the hole at the bottom of the radome base.
8. Secure the cable with the cable clamping plate and gasket. Ground the shield wire by one of the screws of the cable clamping plate.
9. Attach three connectors of the signal cable to respective ports as shown below.

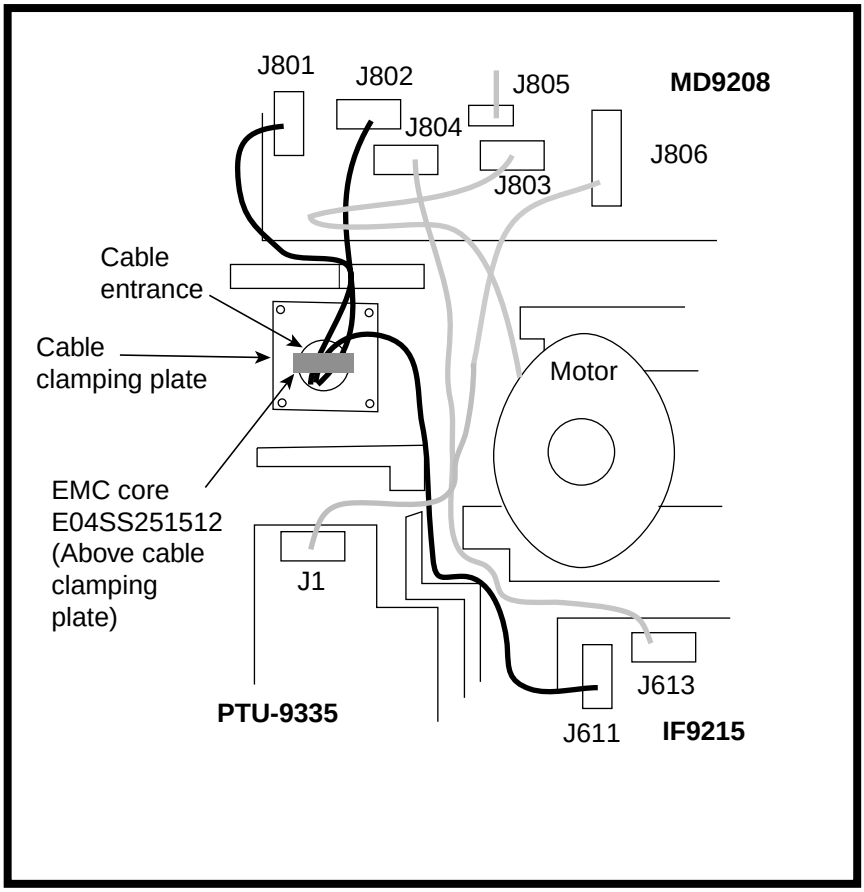


Signal cable, antenna unit side



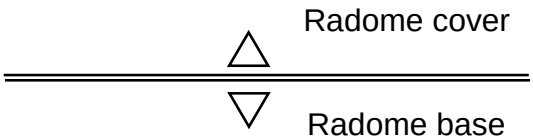
RF unit

10. Attach the EMC core supplied as shown below.



How to attach EMC core

11. Fix the shield cover. Do not pinch the cable.
12. Attach the radome cover, aligning triangle mark on radome cover with that on radome base.



How to position the radome cover

13. Loosely fasten the radome fixing bolts. You will tighten them after confirming magnetron heater voltage.

1.2.4 Mounting the optional mounting bracket

A mounting bracket for fastening the antenna unit to a mast on a sailboat is optionally available.

Mounting bracket 1 (for MODEL-1732/1732C/1733C)

Type: OP03-92
Code No.: 008-445-070

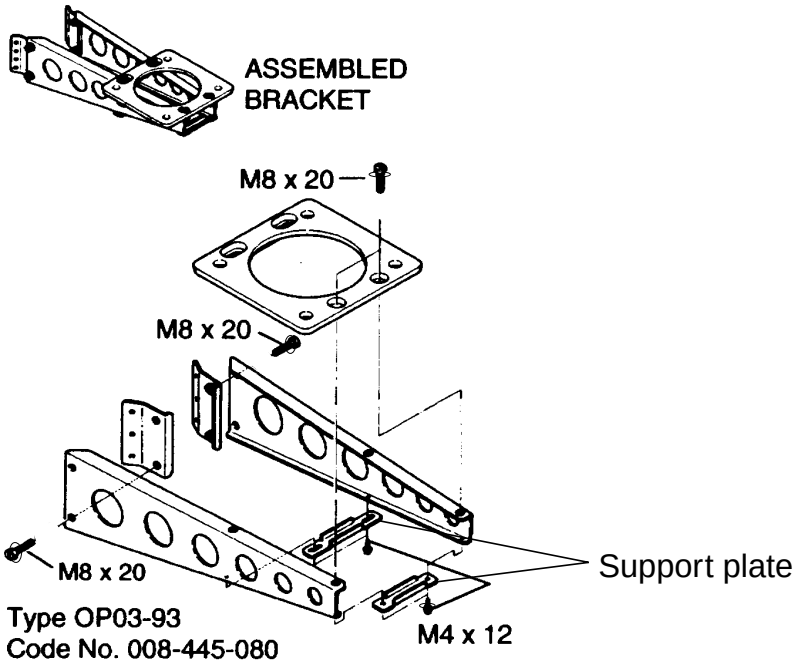
	Type	Code No.	Qty
Hex. bolt	M4X12	000-804-725	4
Hex. bolt	M8X20	000-805-707	8
Mounting plate	03-018-9001-0	100-206-740	1
Support plate (1)	03-018-9005-0	100-206-780	1
Support plate (2)	03-018-9006-0	100-206-790	1
Bracket (1)	03-018-9002-1	100-206-751	1
Bracket (2)	03-018-9003-1	100-206-761	1
Fixing plate	03-018-9004-1	100-206-771	2

Mounting bracket 2 (for MODEL-1722/1722C/1723C)

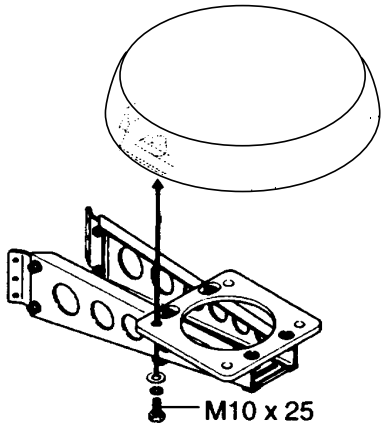
Type: OP03-93
Code No.: 008-445-080

	Type	Code No.	Qty
Hex. bolt	M4X12	000-804-725	4
Hex. bolt	M8X20	000-805-707	8
Mounting plate	03-018-9001-0	100-206-740	1
Support plate (1)	03-018-9005-0	100-206-780	1
Support plate (2)	03-018-9006-0	100-206-790	1
Bracket (1)	03-028-9101-0	100-206-810	1
Bracket (2)	03-028-9102-0	100-206-820	1
Fixing plate	03-028-9103-0	100-206-830	2

Assemble the mounting bracket and fasten it to a mast. Fasten the antenna unit to the bracket.



(A) Assembling the mounting bracket



(B) Fastening antenna to mounting bracket

How to assemble and mount the optional mounting bracket

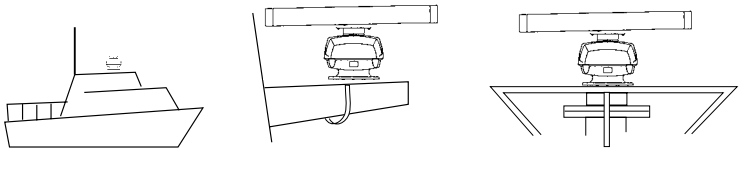
1.3 Mounting of Antenna Unit for MODEL 1742/1742C/1762/1762C/1752/ 1752C/1753C/1763C

1.3.1 Mounting considerations

- The antenna unit is generally installed either on top of the wheelhouse or on the radar mast on a suitable platform. Locate the antenna unit where there is a good all-round view. Any obstruction will cause shadow and blind sectors.
  A mast for instance, with a diameter considerably less than the width of the radiator, will cause only a small blind sector, but a horizontal spreader or crosstrees in the same horizontal plane as the antenna unit would be a much more serious obstruction; you would need to place the antenna unit well above or below it.
- It is rarely possible to place the antenna unit where a completely clear view in all directions is available. Thus, you should determine the angular width and relative bearing of any shadow sectors for their influence on the radar at the first opportunity after fitting.
- If you have a radio direction finder on your boat, keep the antenna unit from its antenna more than two meters to prevent interference to the direction finder.
- To lessen the chance of picking up electrical interference, avoid where possible routing the signal cable near other onboard electrical equipment. Also avoid running the cable in parallel with power cables.
- A magnetic compass will be affected if the antenna unit is placed too close to the magnetic compass. Observe the following compass safe distances to prevent deviation of a magnetic compass: Standard compass, 2.10 m (MODEL 1742/1742C), 1.00 m (MODEL 1762/1762C/1763C), 1.50 m (MODEL 1752/1752C1753C), Steering compass, 1.60 m (MODEL 1742/1742C), 0.80 m (MODEL 1762/1762C/1763C), 1.20 m (MODEL 1752/1752C/1763C).
- Do not paint the radiator aperture, to ensure proper emission of the radar waves.
- When this radar is to be installed on larger vessels, consider the following points:

  The signal cable run between the antenna and the display comes in lengths of 10 m, 15 m, 20 m and 30 m. Whatever length is used it must be unbroken; namely, no splicing allowed.
- Deposits and fumes from a funnel or other exhaust vent can adversely affect the aerial performance and hot gases may distort the radiator portion. The antenna unit must not be mounted where the temperature is more than 70°C.

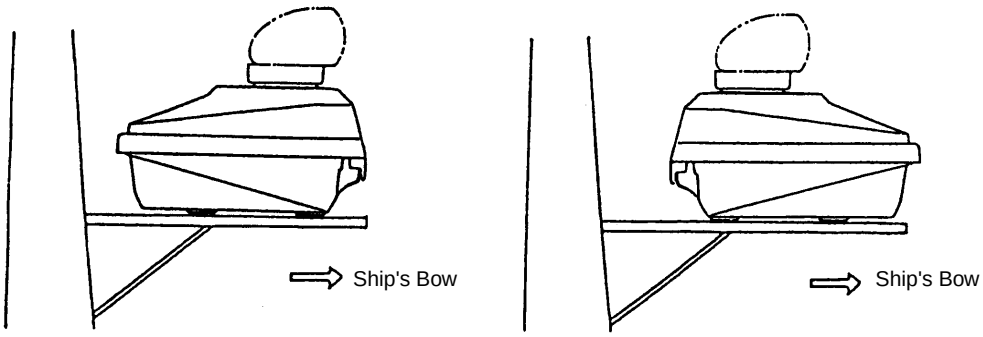
As shown in the figure below, the antenna unit may be installed on the bridge, on a common mast or on the radar mast. For 1752/1752C, mount the antenna unit on a flat surface whose dimensions are greater than 300 x 250 mm.



(a) On bridge (b) Common mast (c) Radar mast

1.3.2 Mounting antenna unit of MODEL 1742/1742C

1. The standard mounting method provides that, the antenna upper housing (“lid”) opens toward the bow. However, the antenna unit may be mounted so the antenna upper housing opens toward the stern. No modifications are required for the former method, however some modification is required for the latter.



(a) Standard (b) Alternative

Mounting of antenna unit

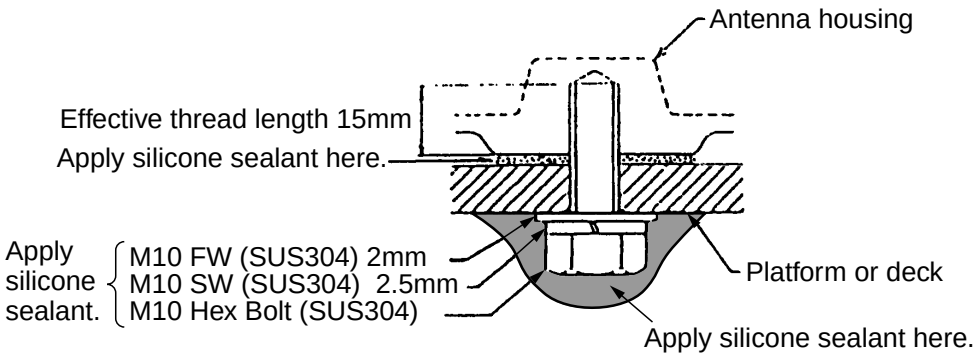
2. Drill four bolts holes (Ø12mm) and one cable entry hole (Ø 25mm) in the radar mast platform or the deck by using the full-sized template.
3. Prepare locally four M10 hex. bolts, flat washers and spring washers for fixing the antenna housing. The length of the bolt depends on the thickness of the radar mast platform or the deck.

Bolt to be prepared locally

Platform thickness	Bolt size
Less than 5 mm	M10x20
Between 5 and 10 mm	M10x25
Between 10 and 15 mm	M10x30
Between 15 and 10 mm	M10x35

4. Place the antenna housing on the chosen position, and orient it as shown in above.

5. Apply silicone sealant to the prepared hex. bolts and washers and to the base of the four “feet” of the antenna housing to prevent corrosion. Secure the antenna housing with the bolts and washers.



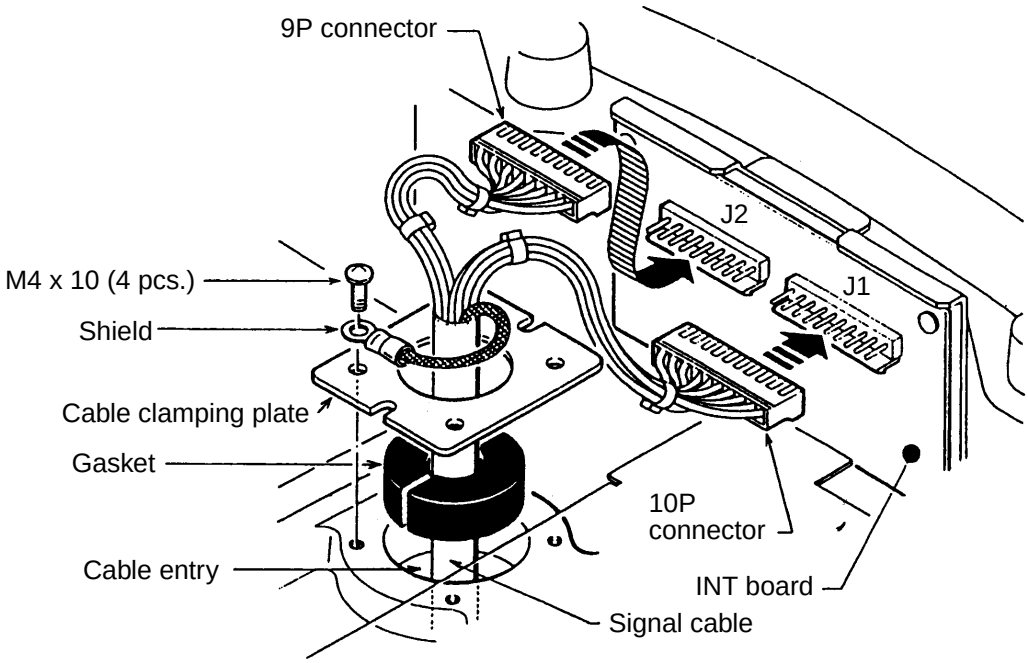
Mounting of scanner housing

Only the signal cable runs from the display unit to the antenna unit. Drill a hole of at least 25 mm diameter through the deck or bulkhead for cable entry. Pass the signal cable through the hole. Apply a sealing compound to the hole for waterproofing.

In order to minimize the chance of picking up electrical interference, avoid where possible routing the signal cable near other onboard electrical equipment. Also, avoid running the cable in parallel with power cables.

The procedure for connecting the signal cable to the antenna unit is as follows.

6. Through a pipe or waterproof cable gland fitted on the wheelhouse top or bulkhead, pass the cable toward the antenna unit.
7. Open the antenna housing cover and fix the stay. Remove the cable clamping plate by loosening four M4 screws and the gasket at the bottom of the antenna housing.

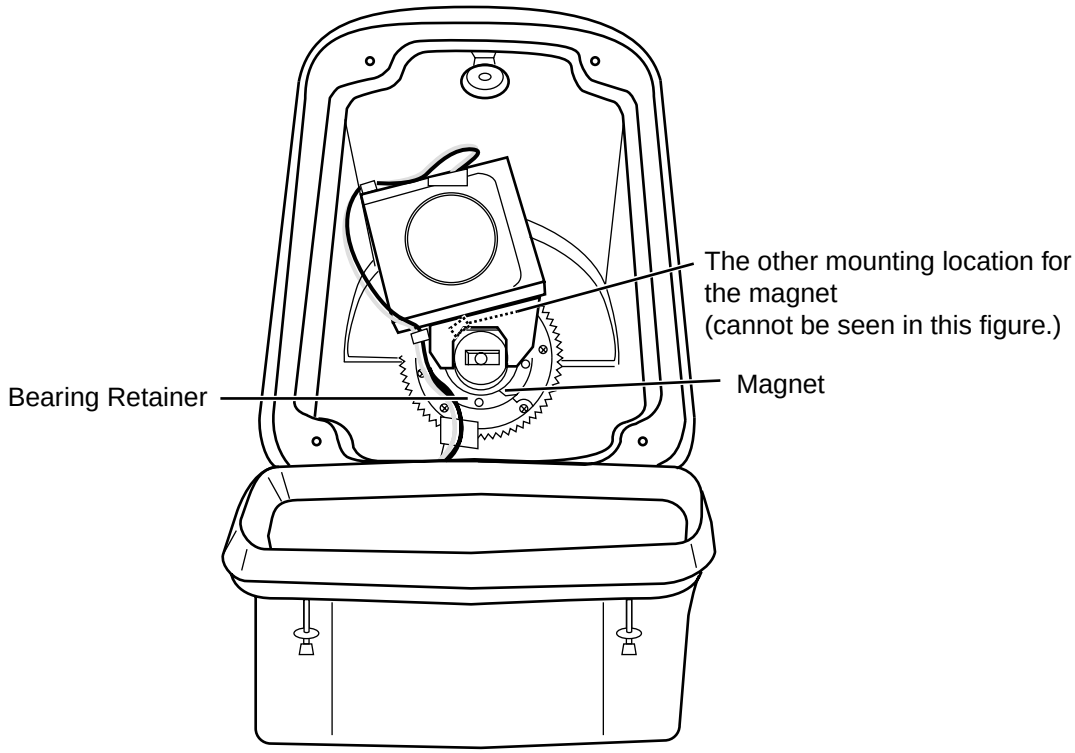


Cable connection and grounding

8. Pass the signal cable through the cable entry at the bottom of the antenna base. Two plugs are provided at the end of the cable for connection inside the unit.
9. Secure the cable with the cable clamping plate and gasket. Ground the shield cable by using one of the fixing screws for the cable clamping plate. See the figure in above.
10. Mate the two plugs with the jacks on the INT Board.
11. Close the antenna housing cover temporarily, because it may have to be opened again for adjustment after installation. Now is the time to begin the procedure for fixing the antenna radiator to the radiator bracket.

For Alternative Mounting

When the antenna unit is reversely mounted, the magnet must be relocated, otherwise the radar screen always the stern view!



Place of magnet

1. Open the antenna housing cover and fix the stay. Turn the antenna radiator by hand until the magnet is in sight.
2. Remove the magnet from the bearing retainer by loosening the M3 screw.
3. Turn the antenna radiator 180° by hand, and you should see the other place for fixing the magnet on the bearing retainer.
4. Fix the magnet removed in step (1) to the place.

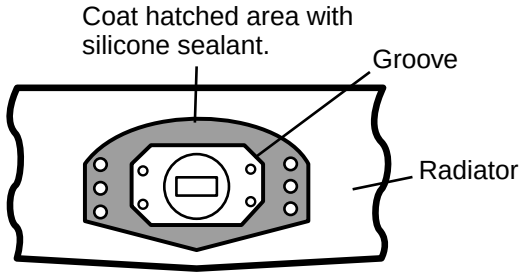
1.3.3 Mounting antenna unit of MODEL 1762/1762C/1763C

Referring to the outline drawing at the back of this manual, drill five holes in the mounting platform: four holes of 15 mm diameter for fixing the antenna unit and one hole of 25-30 mm diameter for the signal cable.

Fastening the Radiator to the Radiator Bracket

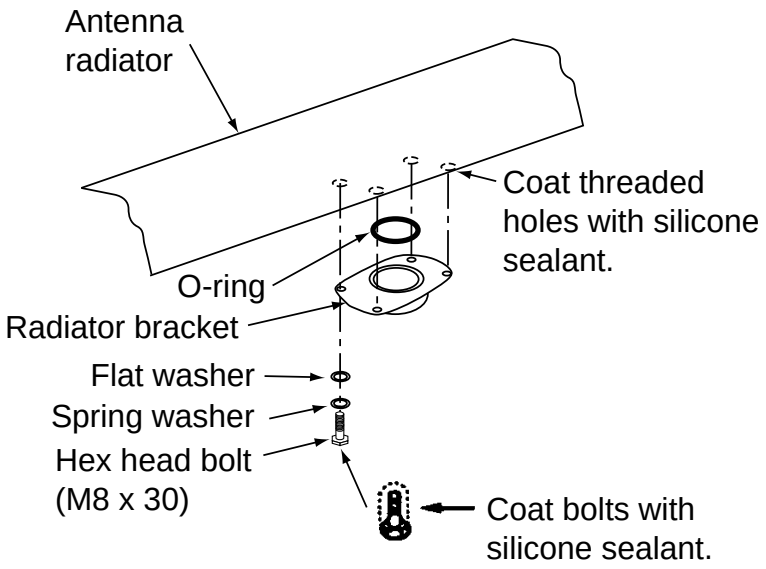
For your reference, antenna installation materials list appears in the packing lists at the back of this manual (see page A-6 to A-8).

1. Remove the radiator cap from the radiator bracket.
2. Coat contacting surface between antenna radiator and radiator bracket with silicone sealant as shown in figure below.



Coating the bottom of antenna radiator with silicone sealant

3. Coat threaded holes on the antenna radiator with silicone sealant.
4. Grease the O-ring and set it to the radiator bracket.
5. Lay the antenna radiator on the radiator bracket.
6. Coat the radiator fixing bolts (4 pcs.) with silicone sealant. Fasten the antenna radiator to the radiator bracket with the radiator fixing bolts, flat washers and spring washers.



Fastening the radiator bracket to the antenna unit chassis

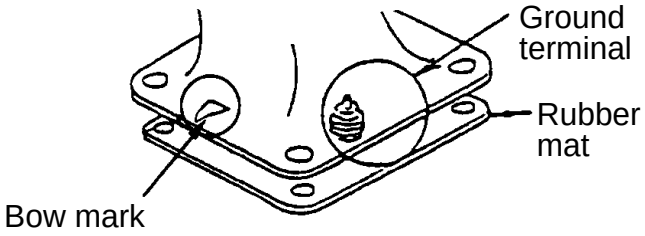
Mounting of antenna unit

The antenna unit can be mounted using the fixing holes on the outside (200 x 200 mm) or inside (140 x 150 mm) the antenna unit.

Outside fixing holes

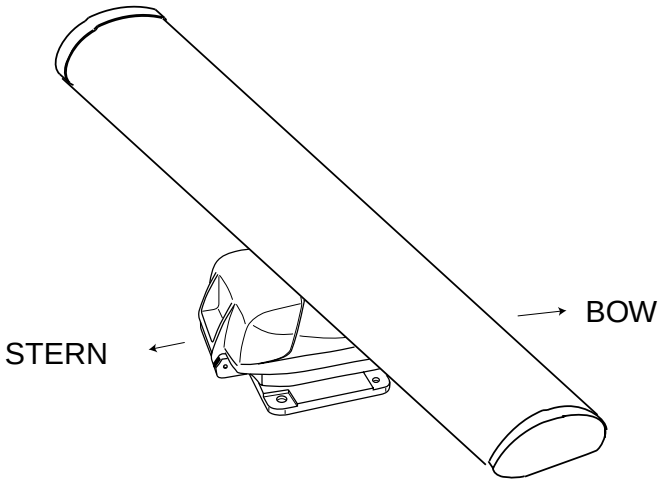
Use the hex head bolt (supplied) to mount the antenna unit as below.

1. Lay the corrosion-proof rubber mat (supplied) on the mounting platform.



Location of rubber mat

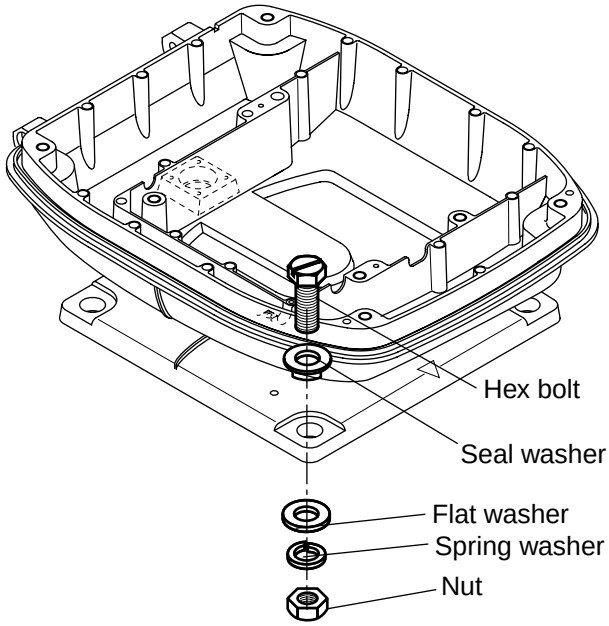
2. Lay the antenna unit on the mounting platform, orienting it as shown in below.



Antenna unit

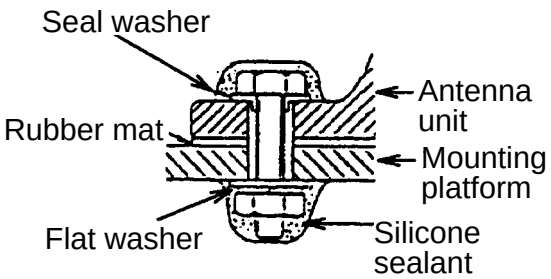
> **⚠ CAUTION**
>
> **Do not lift the Antenna unit by the radiator; lift it by the housing.**
>
> The radiator may be damaged.

3. Insert four hex bolts (M12x60, supplied) and seal washers (ϕ30, supplied) from the top of the antenna housing. Insert the seal washers with the larger diameter next to the bolt heads.



Fixing the antenna unit chassis

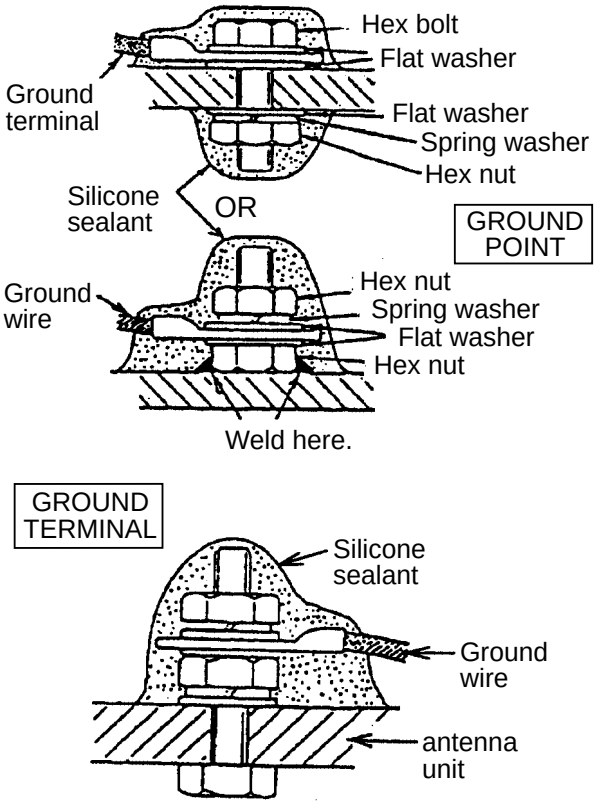
4. Pass flat washers (M12, supplied), spring washers (M12, supplied) and nuts (M12, supplied) onto hex bolts. Fasten by tightening nuts. Do not fasten by tightening the hex bolts; seal washers may be damaged.



How to fasten antenna unit to mounting platform

5. Coat flat washers, spring washers, nuts and exposed parts of bolts with silicone sealant.

6. Prepare ground point in mounting platform (within 300 mm of ground terminal on antenna unit) using M6 x 25 bolt, nut and flat washer (supplied).
7. Run the ground wire (RW-4747, 340 mm, supplied) between the ground terminal and ground point.
8. Coat ground terminal and ground point with silicone sealant as shown below.

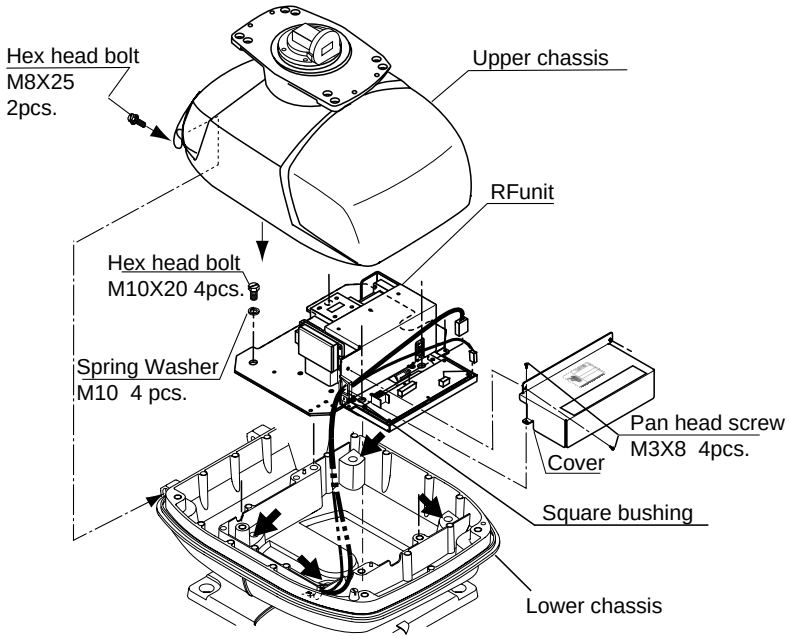


How to coat ground point and ground terminal with silicone sealant

Fixing holes inside antenna unit

This method requires removal of the RF unit in the antenna unit to access inside fixing holes. Use hex head bolts, flat washers, spring washers and nuts (local supply) to mount the antenna unit, confirming length of bolts.

1. Loose four scanner bolts to open the antenna unit. Refer to figure in below for location.

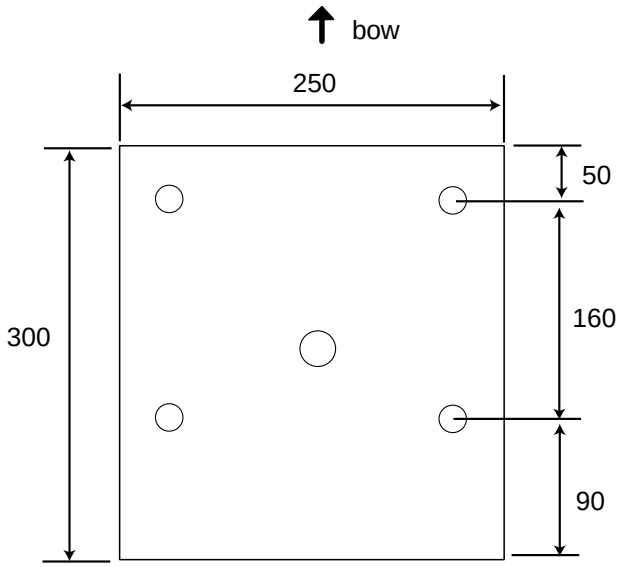


Antenna unit chassis, upper chassis separated

2. Unplug connector connected between upper and lower chassis.
3. Separate upper chassis from lower chassis by removing two hex head bolts (M8x25).
4. Remove cover by unfastening four pan head screws.
5. Remove connector from RF unit.
6. Remove RF unit by unfastening four hex head bolts.
7. Lay the corrosion-proof rubber mat (supplied) on the mounting platform.
8. Fasten the lower chassis to the mounting platform with hex head bolts, spring washers, flat washers and nuts (local supply), and then coat flat washers, nuts and exposed parts of bolts with silicone sealant. Cut a slit in rubber bushing and insert bolt into bushing. Do not use seal washers.
9. Reassemble RF unit, cover and chassis.
10. Set four knob caps (supplied) into outside fixing holes.
11. Do steps 6-8 in “Outside fixing holes”.

1.3.4 Mounting antenna unit of MODEL 1752/1752C/1753C

The antenna unit should be mounted on the flat space larger than the following dimensions to avoid the water entering from the vent or drain hole.



Necessary dimensions for 1752 antenna mounting

Prepare locally four M10 hex. bolts, flat washers and spring washers for fixing the antenna housing. The length of the bolt depends on the thickness of the radar mast platform or the deck.

Bolt to be prepared locally

Platform thickness	Bolt size
Less than 5 mm	M10x25
Between 5 and 10 mm	M10x30
Between 10 and 15 mm	M10x35
Between 15 and 10 mm	M10x40

Fixing holes in mounting platform

Referring to the outline drawing at the end of this manual, drill five holes in the mounting platform: four holes of 15 mm diameter for fixing the antenna unit and one hole of 25 - 30 mm diameter for the signal cable.

When opening the antenna unit before the mounting

If you need to open the antenna cover before mounting the antenna unit, do the following:

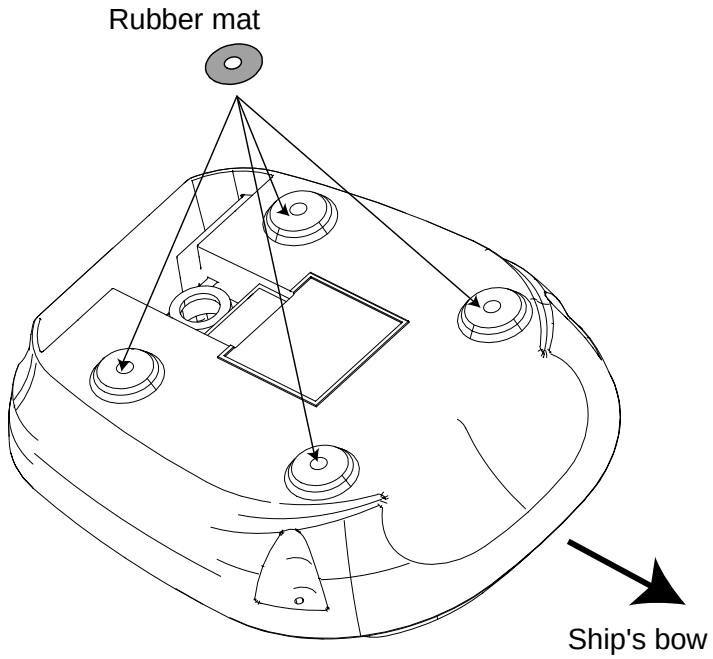
1. Loosely screw in an M10 bolt (local supply) into a mounting hole at the bottom of the antenna unit.
2. Open the antenna cover by grasping the M10 bolt and antenna bracket.

   Note: Do not open the antenna by the radiator.

Mounting the antenna unit

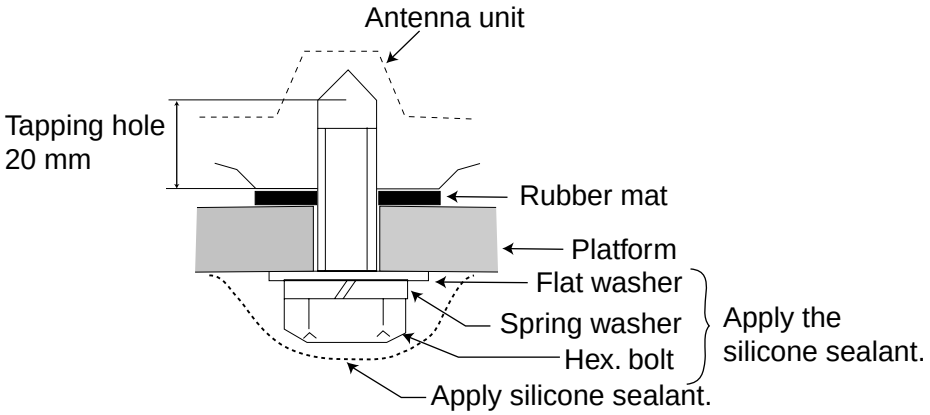
> **⚠ CAUTION**
>
> **Do not lift the Antenna unit by the radiator; lift it by the housing.**
>
> The radiator may be damaged.

1. Attach four rubber mats (supplied) to the bottom of the antenna unit.



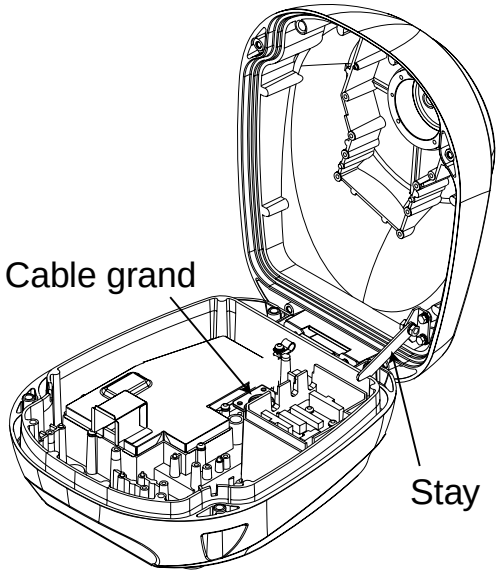
Attaching the insulating rubbers

2. Apply the silicone sealant to four M10 hex. bolts, flat washers and spring washers (local supply), and then fasten the antenna unit to the platform with these materials.



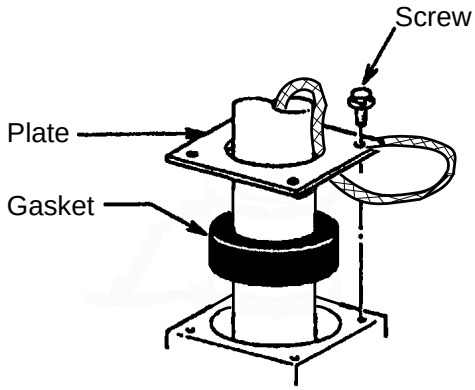
How to fasten antenna unit to mounting platform

3. Coat four hex. bolts, flat washers and spring washers with the silicone sealant as above.
4. Open the antenna unit by loosing four antenna bolts (M6), and then fix the stay.



Antenna unit, cover opened

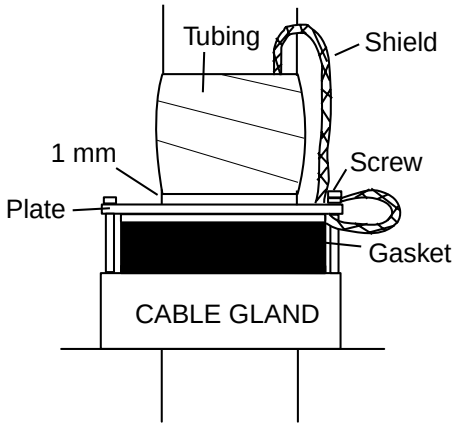
5. Unfasten the cable gland assembly (four screws, plate, gasket).
6. Pass the signal cable with connector through the bottom of the antenna unit.
7. Pass the cable through the gland assembly as shown below.



Passing the signal cable through the cable gland assembly

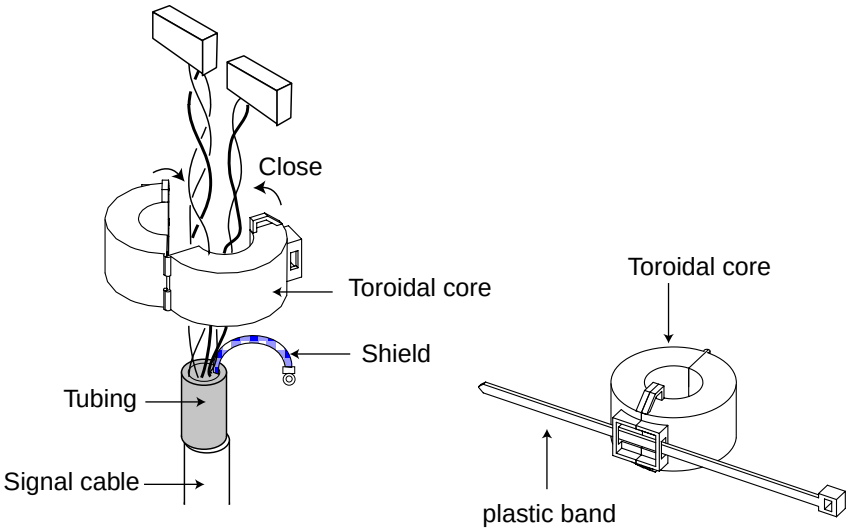
8. Position the signal cable so that approximately 1 mm of the sheath is exposed as shown below. Tighten fixing screws.

   Fasten the crimp-on lug on the shield to one of the fixing screws of the cable gland assembly.



How to fix signal cable in cable gland

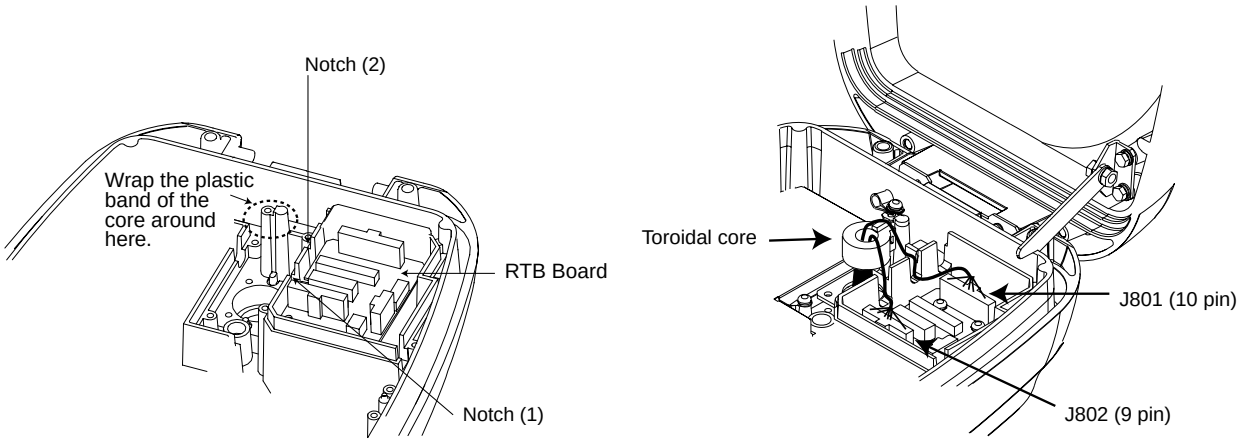
9. Unfasten four screws to remove the INT board cover.
10. Attach the toroidal core (supplied) around two connector cables of the signal cable, leaving the shield outside and close it. Pass the plastic band (supplied) through the hole at outside of the toroidal core, and then fasten the core to the antenna unit chassis referring to the figure shown below.



How to attach toroidal core

How to pass the cable tie to toroidal core

11. Lay two connector cables on the notches; 9 pin: (1), 10 pin: (2) as shown below.



Antenna unit, cover opened

12. Attach the toroidal core to the position shown above by using the plastic band.
13. Attach the connectors of the signal cable to the appropriate position referring the installation above.
14. Attach the INT board cover.
15. Release the stay and close the cover. Loosely fasten the cover fixing screws; you will have to make some adjustments inside after completion of wiring.

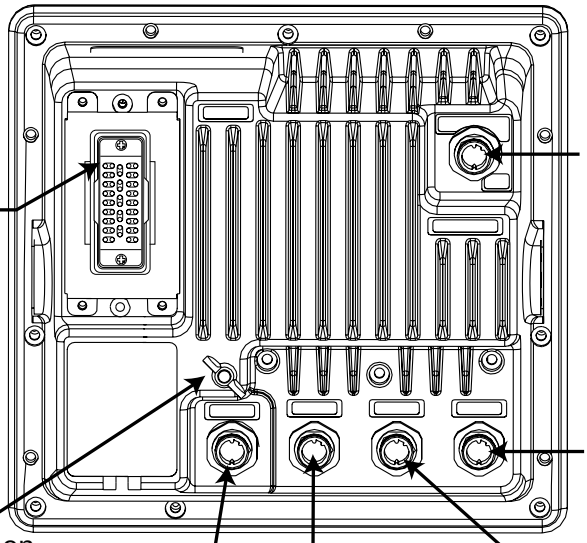
2. WIRING

2.1 Standard Wiring

All wirings are terminated at the rear of the display unit.

⚠ CAUTION

The power cable is shipped with 10 A fuse. Replace the fuse to 5 A (supplied as spare partrs) when the ship's mains is 24 VDC. And then, attach 5 A label to the fuse cover on power cable.
Use of wrong fuse can result in damage to the equipment.



Signal cable connector
Connect signal cable from antenna here.

⚠ CAUTION

Tighten the boot-band securely to ensure watertightness.

12-24 VDC
Connect power cable here.

DATA 1 (7P)
Connect GPS receiver GP-310B/320B or NMEA equipment here.

Ground terminal
Connect ground wire between here and ship's ground.

⚠ CAUTION

Ground the equipment to prevent interference.

DATA 3 (7P)
Connect external buzzer (option), PC here.

DATA 2 (6P)
Connect heading sensor here.
(AD or NMEA format)

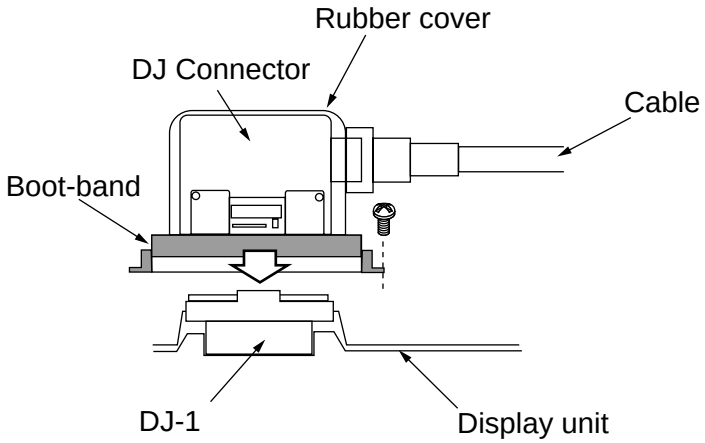
NETWORK (6P)
Connect other NavNet equipment (GD-1700, ETR-6/10N, ETR-30N, HUB etc.) here.

Display unit, rear view

For signal cable connection, see the procedure on the next page.

Signal cable connection

1. Remove the waterproofing cover from the DJ-1 at the back of the display unit.
2. Connect the signal cable to DJ-1 on the rear panel of the display unit.



3. Cover the connector with the rubber cover.
4. Put the boot-band as shown above, and fasten four screws to fix.

Note: When the display unit is used without signal cable connection, do not remove the waterproofing cover. Wrap the display unit and waterproofing cover with vinyl tape.

Power cable

Connect the power cable to the power connector.

Ground terminal

Connect the ground wire (local supply, IV-2sq) between the ground terminal and ship's ground.

DATA1 to DATA3 ports

Other equipments can be connected here as shown below.

DATA1 (7P)	DATA2 (6P)	DATA3 (7P)
GPS receiver GP-310B/320B, NMEA equipments	Heading sensor (ex. SC-60/120)	NMEA IN, NMEA OUT for PC External buzzer

This equipment can receive the following NMEA 0183 format sentence from other equipments.

- Own ship's position: GGA>RMC>RMA>GLL
- Ship's speed: RMC>RMA>VTG>VHW
- External waypoint: RMB>WPL>BWR>BWC
- Heading (True): HDT>HDG>HDM
- Course: RMC>RMA>VTG
- Depth: DPT>DBT
- Temperature: MTW
- Time: ZDA
- Other ship's information: TTM
- Insight satellite information: GSV
- Wind speed and angle: MWV>VWT>VWR

NETWORK port

Other NavNet equipment should be connected to this port with the optional NavNet cable. Available equipment are shown below.

Radar	Plotter	Network sounder	Other
MODEL1722/1732/1742/ 1762/1752/1722C/1732C/ 1742C/1762C/1752C/1723C/ 1733C/1753C/1763C/1823C/ 1833/1933/1943/1833C/1933C/ 1943C/1953C	GD-1700/1700C/ 1900C/1710C	ETR-6/10 ETR-30N	HUB (used when more than two NavNet units are connected.)

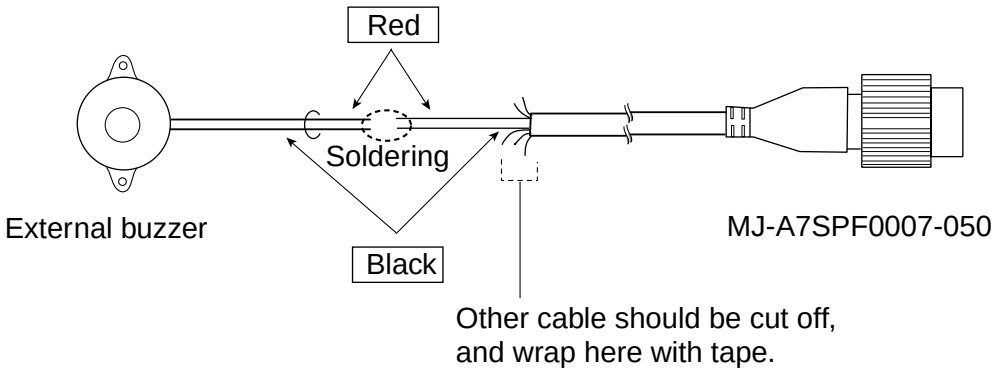
2.2 External Buzzer (OP03-136, option) Connection

The optional external buzzer provides a louder alert when the guard alarm is violated.

External buzzer
Type: OP03-136
Code no.: 000-086-443

Further, you need the optional cable assy MJ-A7SPF0007-050 (w/7P connector, 5 m, code no. 000-144-418).

1. Attach the MJ-A7SPF0007-050 cable assy (option) to the DATA 3 port at the rear of the display unit.
2. Cut the XH connector at the end of external buzzer cable with appropriate length.
3. Solder the cables made at step 2 with MJ-A7SPF0007-050 cable as shown below.

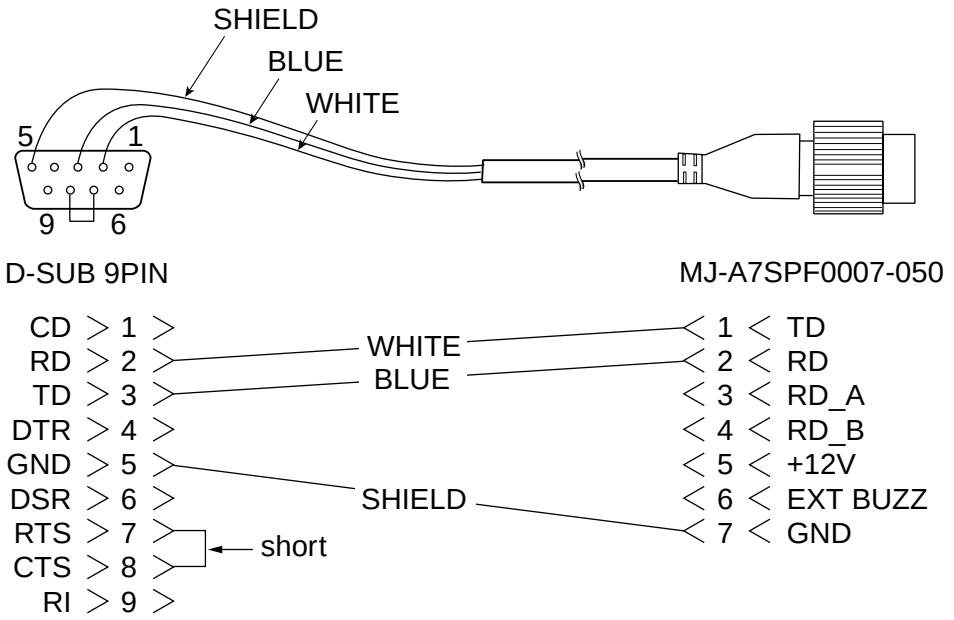


Connection of external buzzer and display unit using cable assy type MJ-A7SPF0007-050 cable

4. Fasten the buzzer with the double-sided tape or two tapping screws (3x15 or 3x20, local supply).

2.3 How to Connect with PC

When connecting with the personal computer, prepare the optional cable assy MJ-A7SPF0007-050 and D-sub 9 pins plug (local supply), and connected them as follows.



MJ-A7SPF0007-050 cable connection for PC

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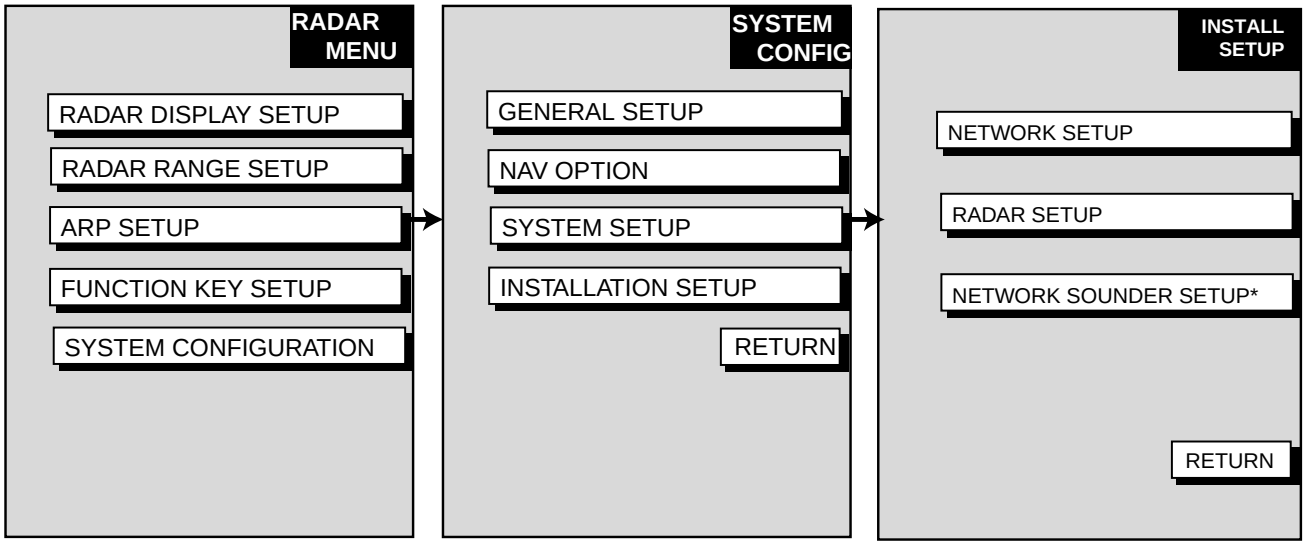
3. ADJUSTMENT

3.1 How to Access to Installation Menu

You should do the set up for the equipment through the installation menu when installation has been finished. To access to the installation menu, follow the steps in below.

1. Press the [POWER/BRILL] key with touch-and-release action while pressing the [MENU] key down. You hear a beep sound.
2. Release the [MENU] key when the message of “STARTING INSTALLATION MODE” appears.
3. After the radar screen appears, press the [MENU] key to show the RADAR MENU.
4. Press the SYSTEM CONFIGURATION soft key to show the SYSTEM CONFIG menu.
5. Press the INSTALLATION SETUP soft key to display the INSTALL SETUP menu.



Radar menu *System configuration menu* *Install setup menu*

How to access the Installation menu

Note: The very first time the system is powered you are asked if you want to start the simulation mode, which provides simulated operation of the equipment. Press the [CLEAR] key to start normal operation for radar adjustment. For further details about the simulation mode, see the operator’s manual.

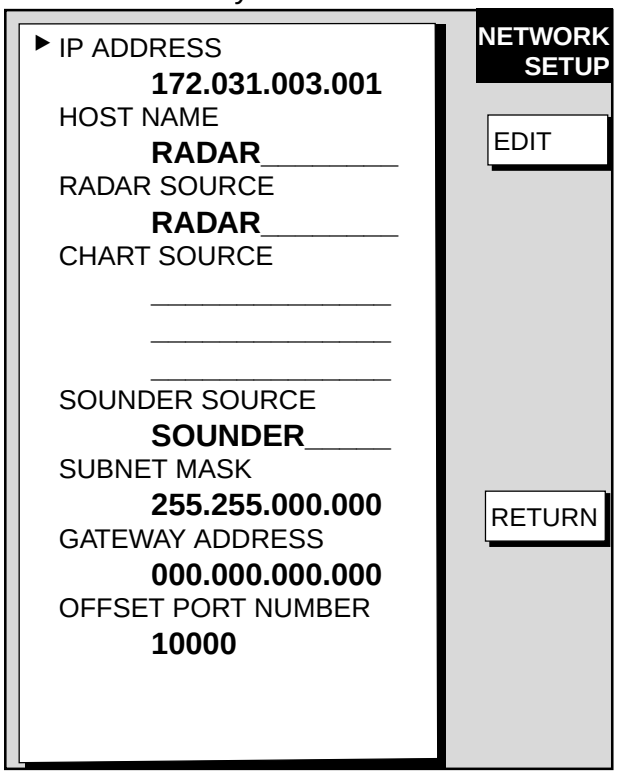
```
START
SIMULATION MODE?
YES  ... PUSH ENTER KNOB
NO   ... PUSH CLEAR KEY
         TO SKIP.
```

Simulation mode window

3.2 NETWORK SETUP Menu

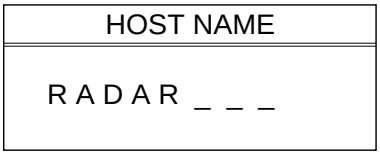
To communicate with other NavNet equipment, this setting should be done.

1. Open the INSTALL SETUP menu.
2. Press the NETWORK SETUP soft key.



NavNet SETUP menu (ex. MODEL1722C series)

3. Select menu option and press the EDIT soft key. For example, select HOST NAME.



Host name window

4. Use the cursor pad to select location and rotate the [ENTER] knob to set character (or value).
5. Press the [ENTER] knob or ENTER soft key to finish.
6. Repeat steps 3-5 for other items.
7. Press the [MENU] key to finish.
8. Continue next setup.

Contents of Network setup menu

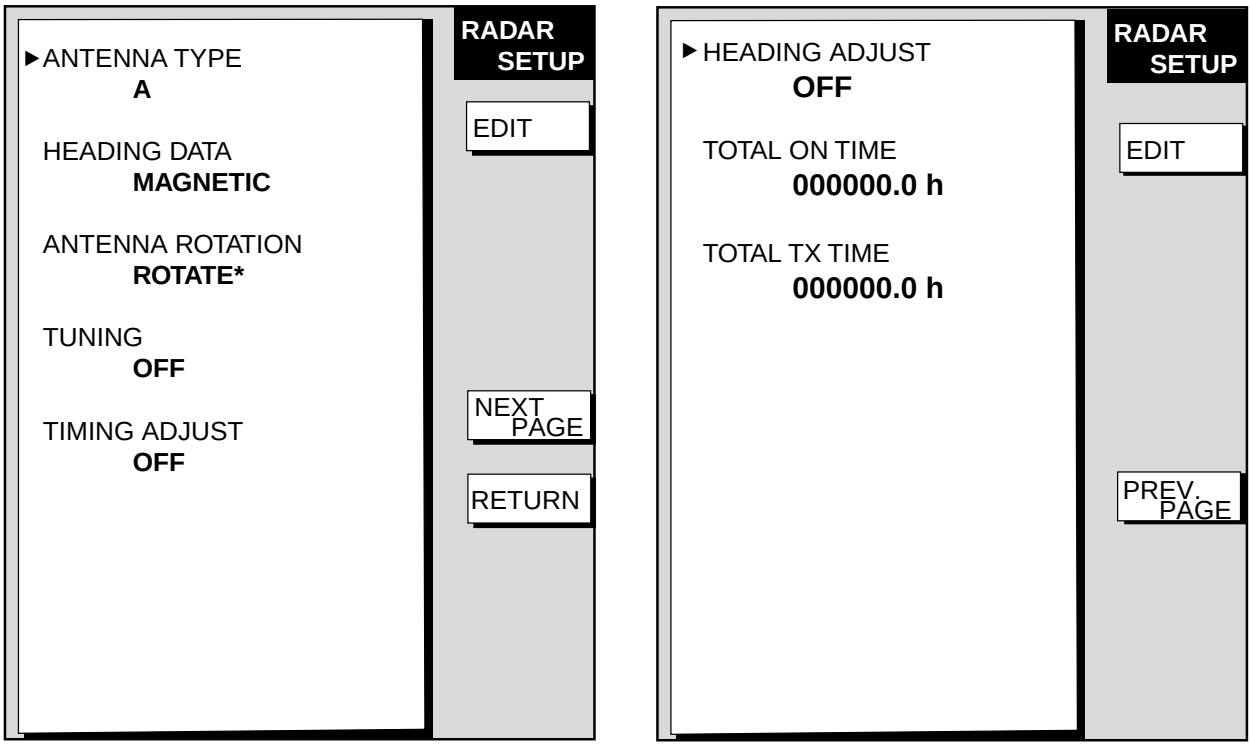
Item	Description	Default Setting
IP ADDRESS	This address is assigned at the factory. Change the address (last three digits; 001 to 254) when like models are connected directly or through the hub. Do this change before connecting the equipment to the other equipment or hub to distinguish. Do not set the same IP address in the network.	**Mono:** 172. 031. 003. 004
		17X2C: 172. 031. 003. 001 **17X3C:** 172. 031. 003. 005
HOST NAME	Set the name for your display unit to distinguish it from others in the NavNet system. Confirm that two equipment don't have same host names. The host name has been preset depending on the series of NavNet. See the table in below. This host name is used for RADAR SOURCE and CHART SOURCE.	RADAR
RADAR SOURCE	Enter the host name "RADAR (preset)" or the new name set at HOST NAME item setting if the unit has been changed of the network radar to use for the radar display.	RADAR
CHART SOURCE	Enter a host name (set at HOST NAME) of network display unit to select equipment which has chart card in its slot (Max. three units, excluding own) to use.	None
SOUNDER SOURCE	The host name of the network sounder ETR-6/10N or ETR-30N is preset (SOUNDER) to use for the video sounder display. Clear the host name when no network sounder is connected.	SOUNDER
SUBNET MASK	Not used. Reserved for future use.	255.255.000.000
GATEWAY ADDRESS		000.000.000.000
OFFSET PORT NUMBER		10000

NavNet equipment default settings

Model	IP ADDRESS	HOST NAME
MODEL1722/1732/1742/1752/1762	172.031.003.004	RADAR
MODEL1722C/1732C/1742C/1752C/1762C	172.031.003.001	RADAR
MODEL1833/1933/1943/1953	172.031.003.002	RADAR
MODEL1723C/1733C/1753C/1763C	172.031.003.005	RADAR
MODEL1833C/1933C/1943C/1953C	172.031.003.003	RADAR
GD-1700/1700C	172.031.014.001	PLOTTER
GD-1900C	172.031.003.003	PLOTTER
GD-1710C	172.031.014.005	PLOTTER

3.3 RADAR SETUP Menu

After the network setup, do the following in order to adjust the radar.
Open the INSTALL SETUP menu, and then press the RADAR SETUP soft key to display the RADAR SETUP menu. When the message of “RADAR DOES NOT TRANSMIT. TRANSMIT RADAR?” appears, press the [ENTER] knob to transmit or [CLEAR] key to cancel transmitting.



Radar setup menu

3.3.1 ANTENNA TYPE

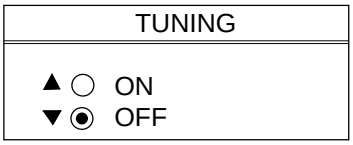
Select the antenna type connecting with your display unit. Default setting is A.
If necessary, reselect the antenna type referring to the table shown below.
After selection, press the [ENTER] knob or ENTER soft key.

Your unit	Setting
MODEL1722/1722C/1723C	A (Default setting)
MODEL1732/1732C/1733C	B
MODEL1742/1742C/1752/1752C/1753C	C
MODEL1762/1762C/1763C	F

3.3.2 TUNING

Initialize the tuning as follows.

1. Transmit the radar
2. Open the RADAR SETUP menu, and then select TUNING by the cursor pad or [ENTER] knob.
3. Press the EDIT soft key or [ENTER] knob to show the setting window.



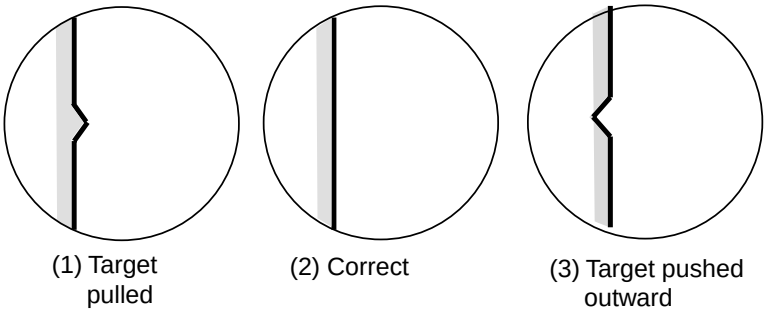
Tuning setup menu

4. Select ON.
5. Press the [ENTER] knob or ENTER soft key to start the auto tuning.
6. After the adjustment is completed, the message of “NOW TUNING” disappears.
7. The equipment returns to the menu display automatically.

3.3.3 TIMING ADJUST

This adjustment ensures proper radar performance, especially on short ranges. The radar measures the time required for a transmitted echo to travel to the target and return to the source. The received echo appears on the display based on this time. Thus, at the instant the transmitter is fired, the sweep should start from the center of the display (sometimes called sweep origin.)

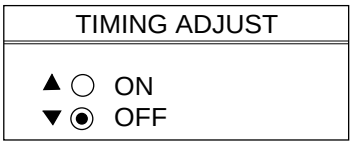
A trigger pulse generated in the display unit goes to the antenna unit through the signal cable to trigger the transmitter (magnetron). The time taken by the signal to travel up to the antenna unit varies, depending largely on the length of signal cable. During this period the display unit should wait before starting the sweep. When the display unit is not adjusted correctly, the echoes from a straight local object (for example, a harbor wall or straight pier) will not appear with straight edges – namely, they will be seen as “pushed out” or “pulled in” near the picture center. The range of objects will also be incorrectly shown.



Examples of improper and correct sweep timing

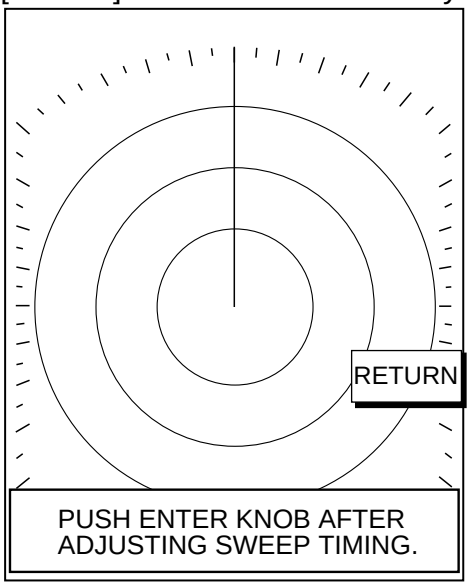
1. Transmit on the shortest range and confirm that gain and A/C SEA are properly adjusted.
2. Visually select a target which forms straight line (harbor wall, straight piers).
3. Open the RADAR SETUP menu and select TIMING ADJUST.

4. Press the EDIT key or [ENTER] key to show the setting window.



Timing adjust setting menu

5. Select ON and press the [ENTER] knob or ENTER soft key to show the radar display.



Timing adjustment setting display

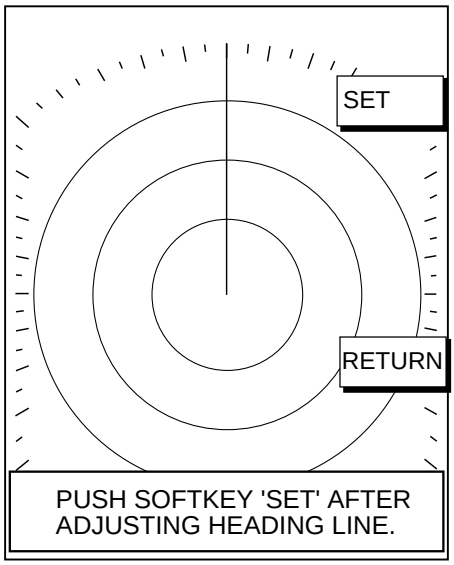
6. Rotate the [ENTER] knob to straighten the target selected at step 2, and then press the RETURN soft key to finish.

3.3.4 HEADING ADJUST

You have mounted the antenna unit facing straight ahead in the direction of the bow. Therefore, a small but conspicuous target dead ahead visually should appear on the heading line (zero degrees).

In practice, you will probably observe some small error on the display because of the difficulty in achieving accurate initial positioning of the antenna unit. The following adjustment will compensate for this error.

1. Set ship's heading toward a suitable target (for example, ship or buoy) at a range between 0.125 and 0.25 nautical mile.
2. Open the RADAR SETUP menu, and press the NEXT PAGE soft key.
3. Select HEADING ADJUST and press the EDIT soft key or [ENTER] knob to show the HEADING ADJUST window.
4. Select ON followed by [ENTER] key or ENTER soft key to show the radar display.



Heading adjustment setting display

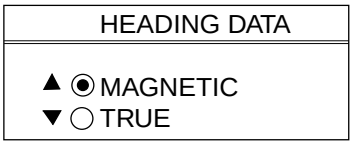
5. Rotate the [ENTER] knob to bisect the target with the EBL.
6. Press the SET soft key.
7. As a final test, move the boat towards a small buoy and confirm that the buoy shows up dead ahead on the radar when it is visually dead ahead.

3.3.5 HEADING DATA

Select the heading reference, MAGNETIC or TRUE. Select MAGNETIC when connecting with the magnetic compass, select TRUE when connecting with the gyrocompass. For your reference, when connecting with Satellite Compass SC-60/120 or Integrated Hading Sensor PG-1000 which Furuno makes, set the heading data as the table shown below.

Model		**Setting of HEADING DATA**
PG-1000	with L/L data	TRUE
	w/o L/L data	MAGNETIC
SC-60/120		TRUE

1. Open the RADAR SETUP menu and then select HEADING DATA.
2. Press the EDIT soft key or [ENTER] knob to show the setting window.



Heading data setting window

3. Select MAGNETIC or TRUE.
4. Press the [ENTER] knob or ENTER soft key.

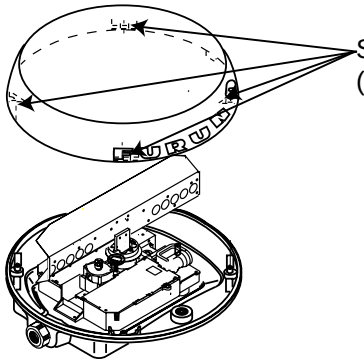
3.4 Checking Magnetron Heater Voltage

Magnetron heater voltage is formed on the PTU/MD Board of the antenna unit, and preadjusted at the factory. Therefore no adjustment is required. However, check magnetron heater voltage for confirmation as follows:

⚠ CAUTION

For MODEL1722/1722C/1723C, lift the radome cover slowly.

The antenna radiator may be caught by the screw holes in the radome cover.
If you feel the radiator is caught by the screw holes, lower the cover, turn it a few degree and then lift it again.



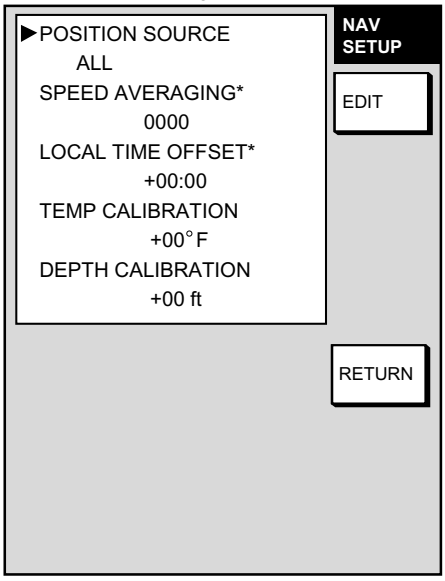
1. Open the antenna unit.
2. Turn on the power. Do not transmit the radar.
3. Connect a multimeter, set to 10VDC range, appropriate position on the MD (1722/1722C/1723C/1742/1742C/1752/1752C/1753C/1762/1762C/1763C) or PTU (1732/1732C/1733C) Board in the antenna unit. Refer to the table in below.
4. Confirm that the multimeter indication is appropriate.

	MODEL 1722/1722C/ 1723C	MODEL 1732/1732C/ 1733C	MODEL 1742/1742C	MODEL 1752/1752C/ 1753C	MODEL 1762/1762C/ 1763C
Check point	TP804#6 (+) and #4 (-) on MD Board	TP802#4 (+) and #6 (-) on PTU Board	TP804#3 (+) and #2 (-) on MD Board	J811#3 and #5 (GND) on MD Board	J825#4 and #6 (GND) on RTB Board
Multimeter indication	7.9 to 8.1 V	7.4 to 7.6 V	8.0 to 8.2 V	7.6 V	7.4 to 7.6 V
Adjustment point	VR801 on MD Board	R106 on PTU Board	VR801 on MD Board	VR801 on MD Board	VR801 on MD Board

3.5 Navigation Data Source

The NAV SOURCE SETTINGS menu mainly selects the source of nav data. For navigator other than the FURUNO GP-310B/GP-320B, speed averaging and local time offset (to use local time instead of UTC time) are also available from this menu.

1. Press the [MENU] key followed by SYSTEM CONFIGURATION, NAV OPTION and NAV SOURCE SETTINGS soft keys to show the NAV SETUP menu.



* For GPS receiver other than GP-310B/GP-320B.

Nav setup menu

2. Select POSITION SOURCE and press the [EDIT] key or [ENTER] knob to show the position source window.
3. Select FURUNO BB GPS, GP, LC or ALL as appropriate and press the [ENTER] knob or ENTER soft key.
   FURUNO BB GPS: GPS Receiver GP-310B/GP-320B
   GP: GPS navigator (via NETWORK or DATA 1 connector)
   LC: Loran C (via NETWORK or DATA 1connector)
   ALL: Multiple navaid connection (via NETWORK or DATA 1connector)
4. **For GPS receiver other than the GP-310B/GP-320B**, you may adjust speed averaging and use local time.
   a) Choose desired item and press the EDIT soft key.
   b) Use the cursor pad to select location and rotate the [ENTER] knob to set value. For time, use the +< - -> - soft key to switch from plus to minus and vice versa.
   c) Press the ENTER soft key.

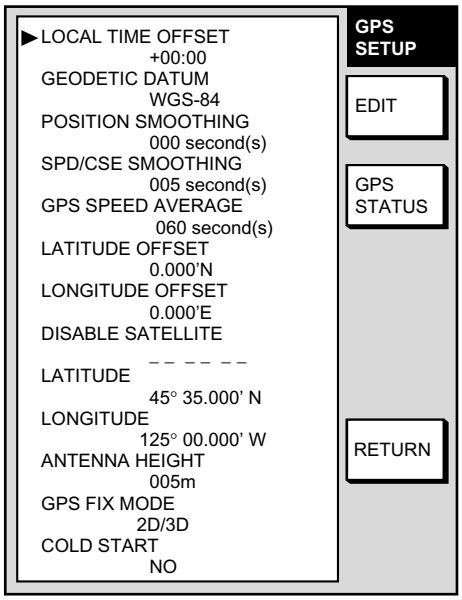
   Speed Averaging: Calculation of ETA is based on average ship's speed over a given period. If the period is too long or too short calculation error will result. Change this setting if calculation error occurs. The default setting, 60 seconds, is suitable for most conditions. The range of adjustment is 0-9999 (sec).

   Local Time Offset: GPS uses UTC time. If you would rather use local time enter the time difference between it and UTC. The range of offset is –13:30 to + 13:30 and the default setting is zero (no offset).

   Temp Calibration: Offsets NMEA water temperature data. The range of adjustment is -40°F to +40°F.

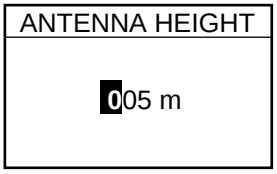
   Depth Calibration: Offsets NMEA depth data. The range of adjustment is –15 to 90 ft.

5. **For GP-310B/GP-320B,** press the RETURN soft key twice to show SYSTEM CONFIG menu.
6. Press the SYSTEM SETUP soft key followed by PORT SETUP and GPS/NMEA PORT soft keys.
7. Select FURUNO GPS SENSOR, and press the [ENTER] knob or EDIT soft key to show FURUNO GPS SENSOR window.
8. Select YES and press the [ENTER] knob or ENTER soft key.
9. Press the RETURN soft key three times followed by NAV OPTIONS, GPS SENSOR SETTINGS soft keys to show the GPS SETUP menu.



GPS setup menu

10. Select LOCAL TIME OFFSET and press the EDIT soft key.
11. Enter time difference between local time and UTC time. Use the + <- - > - soft key to switch from plus to minus and vice versa. And then press the [ENTER] knob or ENTER soft key.
12. Select ANTENNA HEIGHT and press the EDIT soft key.



Antenna height window

13. Enter the height of the GP-310B/320B antenna unit above sea surface. Use the cursor pad to select digit and rotate the [ENTER] knob to set value. The default height is 5 m.
14. Press the [ENTER] knob or ENTER soft key.
15. Choose and set other items as appropriate, referring to the table on the next page.

Contents of GPS sensor settings menu

Item	Description	Settings	Default Setting
Local Time Offset	Allows the user to use local time (instead of UTC time). Enter time difference between local time and UTC time. Use the + < - - > - soft key to switch from plus to minus and vice versa.	-13:30 to +13:30 hr	0 hr (no offset)
Geodetic Datum	Your equipment is preprogrammed with most of the major chart systems of the world. Although the WGS-84 system, the GPS standard, is now widely used other categories of charts still exist. Select the chart system used, not the area where your boat is sailing.	Use the trackball or [ENTER] knob to select appropriate chart.	WGS-84
Position Smoothing	When the DOP or receiving condition is unfavorable, the GPS fix may change, even if the vessel is dead in water. This change can be reduced by smoothing the raw GPS fixes. A setting between 000 to 999 is available. The higher setting the more smoothed the raw data, however too high a setting shows response time to change in latitude and longitude. This is especially noticeable at high ship' speeds. Increase the setting if the GPS fix changes.	0-999 sec	0 sec (no position smoothing)
Spd/Cse Smoothing	During position fixing, ship's velocity (speed and course) is directly measured by receiving GPS satellite signals. The raw velocity data may change randomly depending on receiving conditions and other factors. You can reduce this random variation by increasing the smoothing. Like with latitude and longitude smoothing, the higher the speed and course smoothing the more smoothed the raw data. If the setting is too high, however, the response to speed and course change slows. For no smoothing, enter all zeros.	0-9999 sec	5 sec
GPS Speed Average	Calculation of ETA is based on average ship's speed over a given period. If the period is too long or too short calculation error will result. Change this setting if calculation error occurs. The default setting is 60 seconds, which is suitable for most conditions.	0-9999 sec	60 sec
Latitude Offset	Offsets latitude position to further refine position accuracy. Use the N <- - > S soft key to switch coordinate.	9.999'S – 9.999'N	0.0' (no offset)

(Continued on next page)

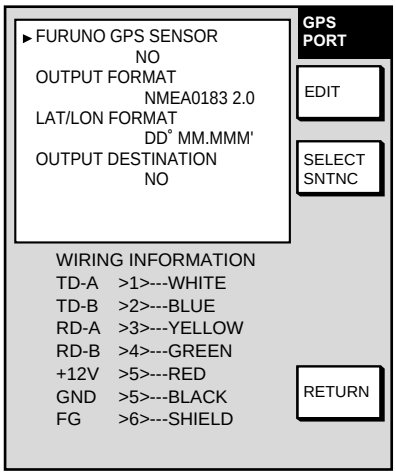
Contents of GPS sensor settings menu (con't.)

Item	Description	Settings	Default Setting
Longitude Offset	As above but for longitude. Use the W < - - > E soft key to switch coordinate.	9.999'E – 9.999'W	0.0' (no offset)
Disable Satellite	Every GPS satellite is broadcasting abnormal satellite number (s) in its Almanac, which contains general orbital data about all GPS satellites, including those which are malfunctioning. Using this information, the GPS receiver automatically eliminates any malfunctioning satellite from the GPS satellite schedule. However, the Almanac sometimes may not contain this information. If you hear about a malfunctioning satellite from another source, you can disable it manually. Enter satellite number (max. 3 satellites) in two digits and press the ENTER soft key.		None
Latitude	Set initial latitude position after cold start. Use the N < - -> S soft key to switch coordinate.	90°S - 90°N	45°35.000'N
Longitude	Set initial longitude position after cold start. Use the W <- - > E soft key to switch coordinate.	180°E - 180°W	125°00.000W
Fix Mode	Choose position fixing method: 2D (three satellites in view), 2D/3D (three or four satellites in view whichever is greater).	2D, 2D/3D	2D/3D
Antenna Height	Enter the height of the GPS antenna unit above sea surface.	0-99 m	5 m
Cold Start	Clears the Almanac to receive the latest Almanac.	No, Yes	No
GPS STATUS (soft key)	Displays GPS satellite status display.		

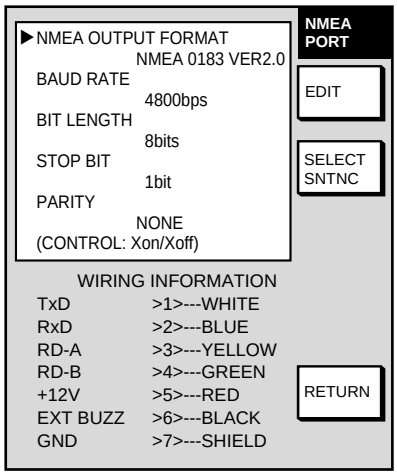
3.6 Setting up Data Ports

Setup the data ports according to the equipment connected to them as follows.

1. Press the [MENU] key to open the menu.
2. Press the SYSTEM CONFIGURATION, SYSTEM SETUP and PORT SETUP soft keys.
3. Press the GPS/NMEA PORT soft key for DATA1 port or PC/NMEA/EXT. BUZZ PORT soft key for DATA3 port as appropriate. One of the following displays appears depending on your selection.

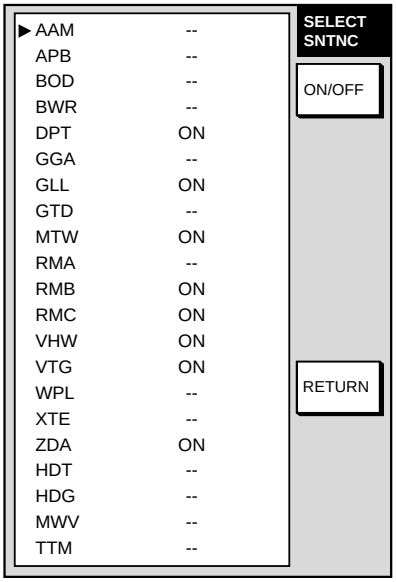


DATA 1 port

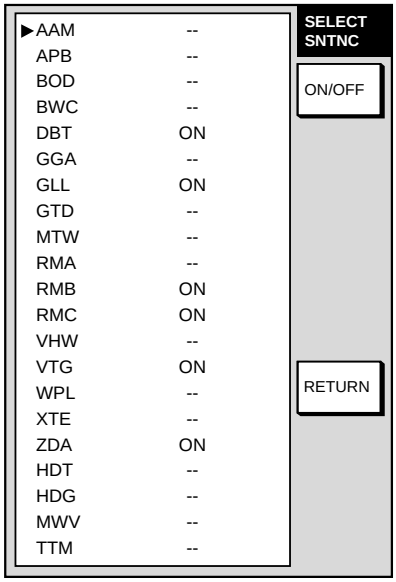


DATA 3 port

4. Select item and press the EDIT soft key.
5. Set option referring to the tables on the next page.
6. To select NMEA data sentences to output, press the SELECT SNTNC soft key. For OUTPUT THROUGH NETWORK port for DATA4 port, select the sentence to output to the network equipment.



NMEA Version 2.0
Range and bearing mode: Rhumb line



NMEA Version 1.5 (w/ARPA)
Range and bearing mode: Great circle

7. Select sentence and press the ON/OFF soft key to show ON (output) or OFF (no output) as appropriate.
8. Press the RETURN soft key.
9. Press the [MENU] key to quit.

Contents of DATA 1 PORT menus

Item	Description	Settings	Default Setting
FURUNO GPS Sensor	Selects whether the GPS Receiver GP-310B/320B is connected to the DATA1 port or not.	Yes, No	No
Output Format	Selects NMEA output version of the equipment connected.	NMEA0183 Ver. 1.5, NMEA0183 Ver. 2.0	NMEA0183 Ver. 2.0
Lat/Lon Format	Selects latitude/longitude format to output.	DD°MM.MM', DD°MM.MMM, DD°MM.MMMM'	DD°MM.MMM'
Output Destination	Selects whether to output route (data sentence RTE) and waypoint data (data sentence WPL) when destination is set.	Yes, No	No
SELECT SNTNC (soft key)	Selects data sentence(s) to output. Select sentence with the cursor pad and press the ON/OFF soft key to show ON or "- -" (OFF) as appropriate. See the figure on the previous page for sentence and default settings.		

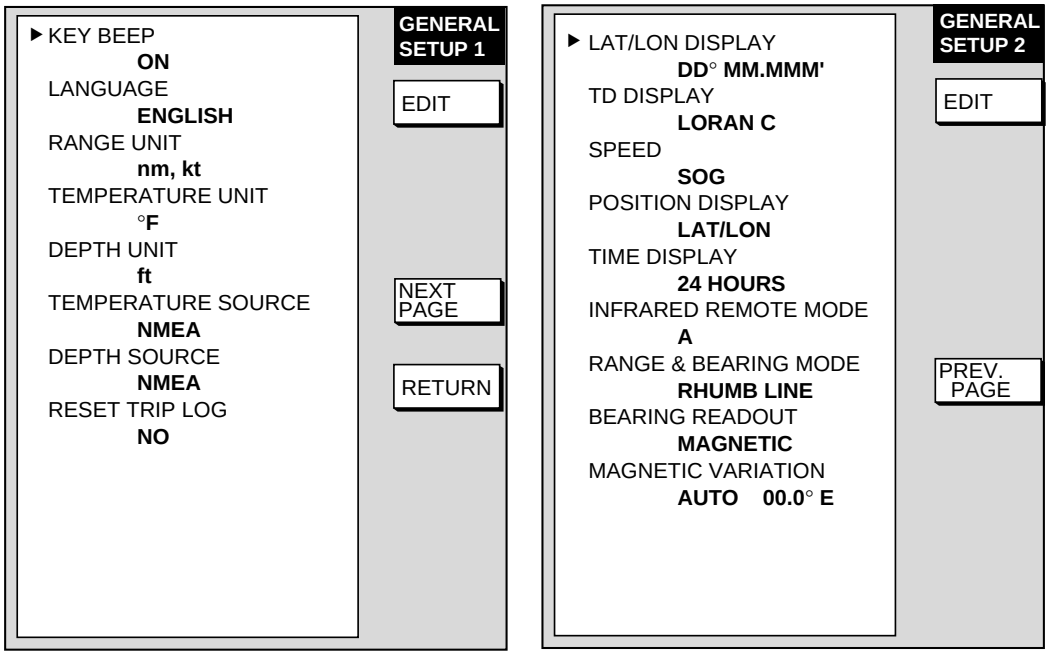
Contents of DATA 3 PORT menu

Item	Description	Settings	Default Setting
NMEA Output Format	Selects NMEA output format.	NMEA Ver. 1.5, NMEA Ver. 2.0	NMEA Ver. 2.0
Baud Rate	Sets baud rate.	4800, 9600, 19200 (bps)	4800(bps)
Bit Length	Sets character length.	8 bit, 7 bit	8 bit
Stop Bit	Sets number of stop bits.	1 bit, 2 bit	1 bit
Parity	Sets parity bit.	Even, Odd, None	None
SELECT SNTNC (soft key)	Chooses data sentences to output. For further details see the illustration "NMEA data sentences" on page 3-13.		

3.7 Remote Controller Setting

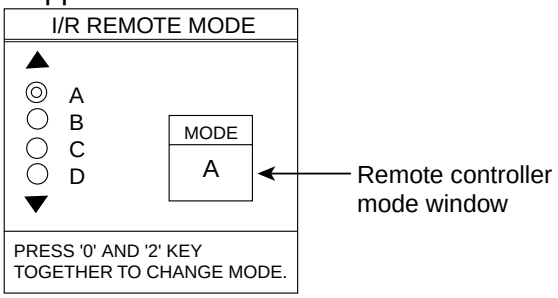
A remote controller can be set exclusively for use with a specific display unit, in the case of multiple NavNet display units. Set the remote controller mode desired on the menu and attach appropriate label (supplied with accessories) to the remote controller and display unit.

1. Press the [MENU] key, followed by SYSTEM CONFIGURATION soft key and GENERAL SETUP soft key to show the GENERAL SETUP 1 menu.



GENERAL SETUP menu

2. Press the NEXT PAGE soft key to show GENERAL SETUP 2 menu.
3. Select INFRARED REMOTE MODE, and press the EDIT soft key.
   The I/R REMOTE MODE window appears.
4. Point the remote controller toward the display unit, and press any key on the remote controller. Preset mode appears in the remote controller mode window.



Select I/R REMOTE window

5. Confirm the remote controller mode on the window, and press the [0] and [2] key together on the remote controller to change the controller mode setting among A, B, C and D.
6. Operate the cursor pad so that the display mode should be the same as the controller mode setting.
7. Press the [MENU] key to close the menu.

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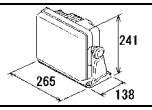
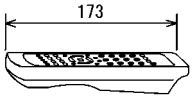
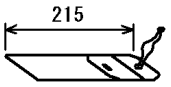
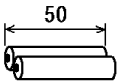
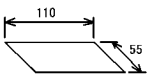
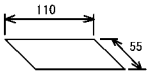
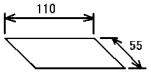
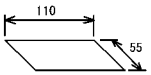
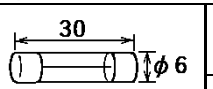
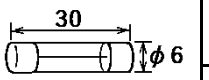
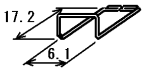
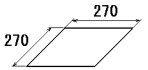
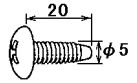
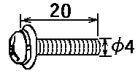
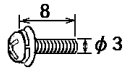
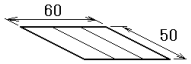
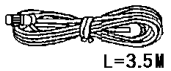
PACKING LIST

NAME	OUTLINE	DESCRIPTION/CODE №	Q'TY
ユニット UNIT			
指示部 DISPLAY UNIT			1
ﾘﾓｺﾝｾｯﾄ REMOTE CONTROLLER SET			
ﾘﾓｺﾝｷｰﾕﾆｯﾄ REMOTE CONTROLLER		RMC-100 000-144-471	1
ﾘﾓｺﾝﾋﾞﾆｰﾙｹｰｽ VINYL CASE FOR REMOTE CONTROLLER		14-034-2075-1 100-292-801	1
BATT(MN) SIZE AA BATTERY		R6PKRCP-2 000-142-527	1
ﾘﾓｺﾝｼｰﾙ(1) LABEL FOR REMOTE CONTROLLER		03-153-1314-2 100-292-792	1
ﾘﾓｺﾝｼｰﾙ(2) LABEL FOR REMOTE CONTROLLER		03-153-1315-2 100-292-822	1
ﾘﾓｺﾝｼｰﾙ(3) LABEL FOR REMOTE CONTROLLER		03-153-1316-2 100-292-832	1
ﾘﾓｺﾝｼｰﾙ(4) LABEL FOR REMOTE CONTROLLER		03-153-1317-2 100-292-842	1
予備品 SPARE PARTS		**SP03-13801**	
ﾋｭｰｽﾞ FUSE		FGBO 10A AC125V 000-549-065	3
ﾋｭｰｽﾞ FUSE		FGBO 5A AC250V 000-549-022	3

1.ｺｰﾄﾞ末尾に[**]の付いたﾕﾆｯﾄは代表の型式/ｺｰﾄﾞを表示しています。
DOUBLE ASTERISK DENOTES COMMONLY USED EQUIPMENT.

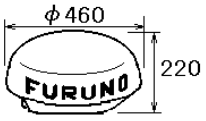
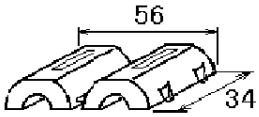
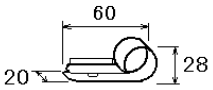
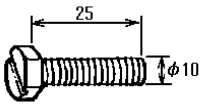
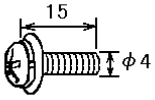
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

NAME	OUTLINE	DESCRIPTION/CODE №	Q'TY
付属品 ACCESSORIES		**FP03-09301**	
ｶｰﾄﾞ用ﾋﾟﾝ CARD REMOVER		03-153-1311-0 100-292-130	1
工事材料 INSTALLATION MATERIALS		**CP03-22201**	
型紙 TEMPLATE SHEET		03-153-1313-0 100-292-780	1
+ﾄﾗｽﾀｯﾋﾟﾝﾈｼﾞ +TAPPING SCREW		5X20 SUS304 1ｼｭ 000-802-081	4
+ﾅﾍﾞｾﾑｽﾈｼﾞB WASHER HEAD SCREW		M4X20 SUS304 000-804-742	6
+ﾅﾍﾞｾﾑｽﾈｼﾞB WASHER HEAD SCREW		M3X8 SUS304 000-802-606	4
ﾋｭｰｽﾞﾊﾘﾏｰｸ FUSE LABEL		03-153-1312-0 100-292-140	1
その他工材 OTHER INSTALLATION MATERIALS			
ｹｰﾌﾞﾙ組品MJ CABLE ASSY.		MJ-A3SPF0016-035 000-138-454	1

PACKING LIST

19AK-X-9853 -1 1/1

RSB-0087-A-070

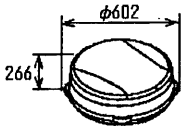
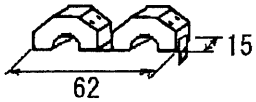
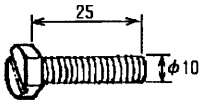
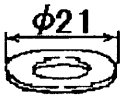
NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
空中線部 ANTENNA UNIT		RSB-0087-A-070 000-089-835	1
空中線部工材 ANTENNA UNIT INSTALLATION MATERIALS CP03-20301			
EMIｺｱ EMI CORE		RFC-10 000-141-085	1
ｺｱ取付板 EMI CORE FIXING PLATE		03-146-0101-0 100-277-850	1
六角ﾎﾞﾙﾄ ｽﾘ割 HEX.BOLT (SLOTTED HEAD)		M10X25 SUS304 000-862-308	4
+ｰﾅﾍﾞｾﾑｽﾈｼﾞB WASHER HEAD SCREW		M4X15 C2700W MBNI2 000-881-448	1

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

PACKING LIST

19AK-X-9854 -1 1/1

RSB-0071-058

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
(完) 空中線部 ANTENNA UNIT		RSB-0071-058 000-086-822	1
空中線部工材 ANTENNA UNIT INSTALLATION MATERIALS		CP03-18001	
EMCｺｱ EMC CORE		E04SS251512 000-144-673	1
六角ﾎﾞﾙﾄ ｽﾘ割 HEX.BOLT (SLOTTED HEAD)		M10X25 SUS304 000-862-308	4
ﾐｶﾞｷ平座金 FLAT WASHER		M10 SUS304 000-864-131	4
ﾊﾞﾈ座金 SPRING WASHER		M10 SUS304 000-864-261	4

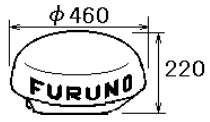
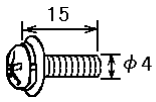
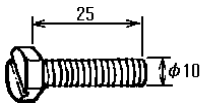
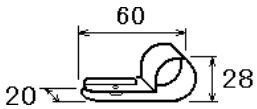
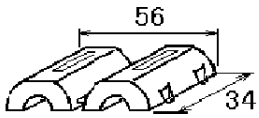
DWG NO.
C3496-Z01- B

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

PACKING LIST

19AP-X-9851 -0 1/1

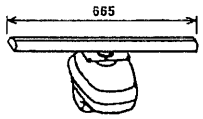
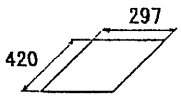
RSB-110-070-A

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
空中線部 ANTENNA UNIT		RSB-110-070-A 000-080-238	1
工事材料 INSTALLATION MATERIALS		**CP03-20301**	
+ーナﾍﾞｾﾑｽﾈｼﾞB WASHER HEAD SCREW		M4X15 C2700W MBNI2 000-881-448	1
六角ﾎﾞﾙﾄ ｽﾘ割 HEX.BOLT (SLOTTED HEAD)		M10X25 SUS304 000-862-308	4
ｺｱ取付板 EMI CORE FIXING PLATE		03-146-0101-0 100-277-850	1
EMIｺｱ EMI CORE		RFC-10 000-141-085	1

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

PACKING LIST

XN065AF-RSB-0047-051

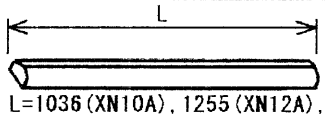
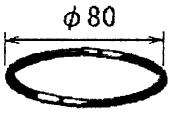
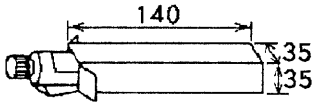
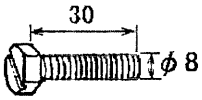
NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
空中線部 ANTENNA UNIT		XN065AF-RSB-0047-051 000-086-717	1
空中線部工材 ANTENNA UNIT INSTALLATION MATERIALS		CP03-22081	
空中線取付型紙 ANTENNA UNIT MOUNTING PLATE		C3343-G02 000-802-309	1

DWG NO.
C3498-Z01- A

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

PACKING LIST

XN10A, XN12A

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
ｱﾝﾃﾅ ANTENNA	 L=1036(XN10A), 1255(XN12A),	XN10A, 12A 008-523-***	1
ｱﾝﾃﾅ工材 ANTENNA INSTALLATION MATERIALS		CP03-22901	
Oﾘﾝｸﾞ O-RING		JISB2401-1A-G80 000-851-313	1
ｽﾘｰﾎﾞﾝﾄﾞ SEALANT		1211 50G 000-854-118	1
六角ﾎﾞﾙﾄ ｽﾘﾜﾘ HEX. BOLT		M8X30 SUS304 000-862-151	4
ﾐｶﾞｷ平座金 FLAT WASHER		M8 SUS304 000-864-130	4
バネ座金 SPRING WASHER		M8 SUS304 000-864-262	4

DWG NO.
C3500-Z01- C

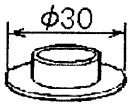
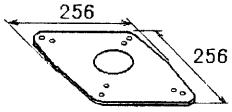
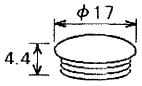
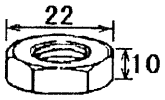
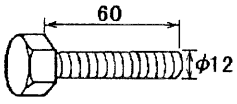
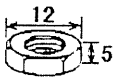
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO

CODE NO.	008-503-360	03FR-X-9401 -7
TYPE	CP03-18401	1/2

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ｼｰﾙﾜｯｼｬ SEAL WASHER		03-001-3002-0 CODE NO. 300-130-020	4	
2	防蝕ゴム CORROSION-PROOF RUBBER MAT		03-142-3001-0 CODE NO. 100-275-580	1	
3	ｷｬｯﾌﾟ CAP		040-4010 CODE NO. 000-515-332	4	
4	六角ﾅｯﾄ 1種 HEX. NUT		M12 SUS304 CODE NO. 000-863-112	4	
5	ﾐｶﾞｷ平座金 FLAT WASHER		M12 SUS304 CODE NO. 000-864-132	4	
6	ﾊﾞﾈ座金 SPRING WASHER		M12 SUS304 CODE NO. 000-864-263	4	
7	六角ﾎﾞﾙﾄ（全ﾈｼﾞ） HEX. BOLT		M12X60 SUS304 CODE NO. 000-862-191	4	
8	六角ﾅｯﾄ 1種 HEX. NUT		M6 SUS304 CODE NO. 000-863-109	1	
9	ﾐｶﾞｷ平座金 FLAT WASHER		M6 SUS304 CODE NO. 000-864-129	3	
10	ﾊﾞﾈ座金 SPRING WASHER		M6 SUS304 CODE NO. 000-864-260	1	

DWG NO.
C3459-M02- G

FURUNO ELECTRIC CO., LTD.

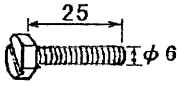
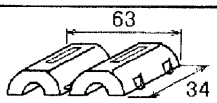
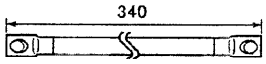
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	008-503-360	03FR-X-9401-7
TYPE	CP03-18401	2/2

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
11	六角ボルト HEX. BOLT		M6X25 SUS304 CODE NO. 000-862-180	1	
12	EMIコア EMI CORE		RFC-13 CODE NO. 000-141-084	3	
13	アース線 GROUNDING WIRE		RW-4747-1 03S4747 CODE NO. 000-566-000	1	

DWG NO.
C3459-M04- G

FURUNO ELECTRIC CO., LTD.

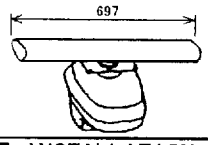
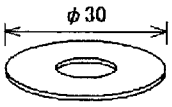
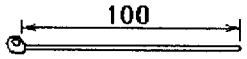
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

A-6C

PACKING LIST

03GF-X-9851 -1 1/1

XN065BF-RSB-0091-069

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
空中線部 ANTENNA UNIT		XN065BF-RSB-0091-069 000-080-148	1
空中線部工材 ANTENNA UNIT INSTALLATION MATERIALS		CP03-24001	
絶縁ｺﾞﾑ RUBBER MAT		03-157-0101 100-296-920	4
ｺﾝﾍﾞｯｸｽ PLASTIC BAND		CV-100 000-570-322	1
ﾄﾛｲﾀﾞﾙｺｱ TOROIDAL CORE		TFC-25-15-12A 000-145-474	1

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

C3508-Z01-B

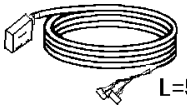
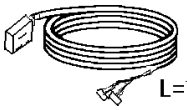
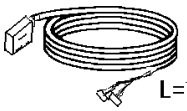
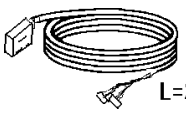
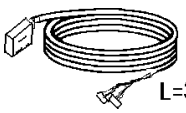
FURUNO

CODE NO.		19AK-X-9401 -1
TYPE		1/1

工事材料表

INSTALLATION MATERIALS

MODEL1722/1722C/1723C

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS		数量 Q'TY	用途／備考 REMARKS
1	信号ｹｰﾌﾞﾙ組品 SIGNAL CABLE ASSY.		S03-87- 5		1	選択 TO BE SELECTED
			CODE NO.	008-523-080		
2	信号ｹｰﾌﾞﾙ組品 SIGNAL CABLE ASSY.		S03-87-10		1	選択 TO BE SELECTED
			CODE NO.	008-523-090		
3	信号ｹｰﾌﾞﾙ組品 SIGNAL CABLE ASSY.		S03-87-15		1	選択 TO BE SELECTED
			CODE NO.	008-523-100		
4	信号ｹｰﾌﾞﾙ組品 SIGNAL CABLE ASSY.		S03-87-20		1	選択 TO BE SELECTED
			CODE NO.	008-523-110		
5	信号ｹｰﾌﾞﾙ組品 SIGNAL CABLE ASSY.		S03-87-30		1	選択 TO BE SELECTED
			CODE NO.	008-523-120		

FURUNO ELECTRIC CO ., LTD.

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

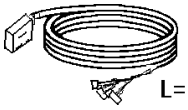
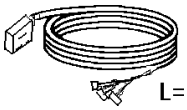
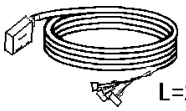
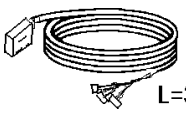
FURUNO

CODE NO.		19AK-X-9402 -1
TYPE		1/1

工事材料表

INSTALLATION MATERIALS

MODEL1732/1732C/1733C

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS		数量 Q'TY	用途／備考 REMARKS
1	信号ｹｰﾌﾞﾙ組品 SIGNAL CABLE ASSY.	 L=10M	S03-88-10		1	選択 TO BE SELECTED
			CODE NO.	008-523-130		
2	信号ｹｰﾌﾞﾙ組品 SIGNAL CABLE ASSY.	 L=15M	S03-88-15		1	選択 TO BE SELECTED
			CODE NO.	008-523-140		
3	信号ｹｰﾌﾞﾙ組品 SIGNAL CABLE ASSY.	 L=20M	S03-88-20		1	選択 TO BE SELECTED
			CODE NO.	008-523-150		
4	信号ｹｰﾌﾞﾙ組品 SIGNAL CABLE ASSY.	 L=30M	S03-88-30		1	選択 TO BE SELECTED
			CODE NO.	008-523-160		

FURUNO ELECTRIC CO ., LTD.

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

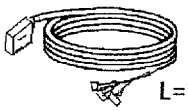
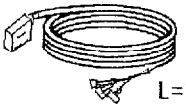
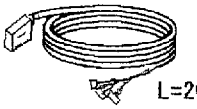
FURUNO

CODE NO.		19AK-X-9403 -1
TYPE		1/1

工事材料表

INSTALLATION MATERIAL

MODEL1742/C、1752/C

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	信号ｹｰﾌﾞﾙ組品 SIGNAL CABLE ASSY.	 L=10M	S03-90-10 CODE NO. 008-523-170	1	選択 TO BE SELECTED
2	信号ｹｰﾌﾞﾙ組品 SIGNAL CABLE ASSY.	 L=15M	S03-90-15 CODE NO. 008-523-180	1	選択 TO BE SELECTED
3	信号ｹｰﾌﾞﾙ組品 SIGNAL CABLE ASSY.	 L=20M	S03-90-20 CODE NO. 008-523-190	1	選択 TO BE SELECTED
4	信号ｹｰﾌﾞﾙ組品 SIGNAL CABLE ASSY.	 L=30M	S03-90-30 CODE NO. 008-523-200	1	選択 TO BE SELECTED

FURUNO ELECTRIC CO., LTD

（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

A-10

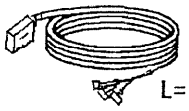
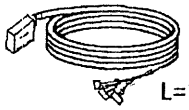
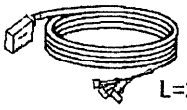
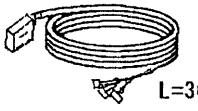
FURUNO

CODE NO.		19AK-X-9404-0
TYPE		1/1

工事材料表

INSTALLATION MATERIALS

MODEL1762/1762C

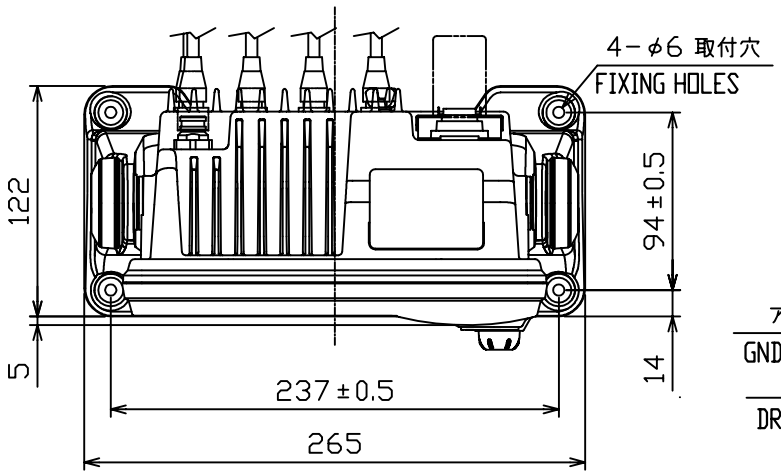
番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS		数量 Q'TY	用途／備考 REMARKS
1	信号ケーブル組品 SIGNAL CABLE ASSY.	 L=10M	S03-89-10		1	選択 TO BE SELECTED
			CODE NO.	008-523-210		
2	信号ケーブル組品 SIGNAL CABLE ASSY.	 L=15M	S03-89-15		1	選択 TO BE SELECTED
			CODE NO.	008-523-220		
3	信号ケーブル組品 SIGNAL CABLE ASSY.	 L=20M	S03-89-20		1	選択 TO BE SELECTED
			CODE NO.	008-523-230		
4	信号ケーブル組品 SIGNAL CABLE ASSY.	 L=30M	S03-89-30		1	選択 TO BE SELECTED
			CODE NO.	008-523-240		

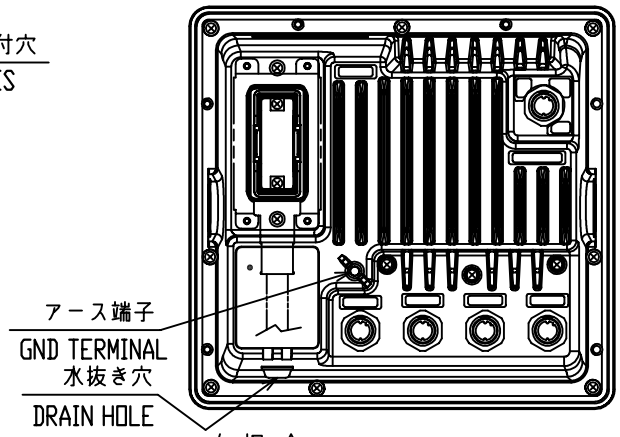
DWG NO.
C3500-M01- A

FURUNO ELECTRIC CO., LTD.

(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO

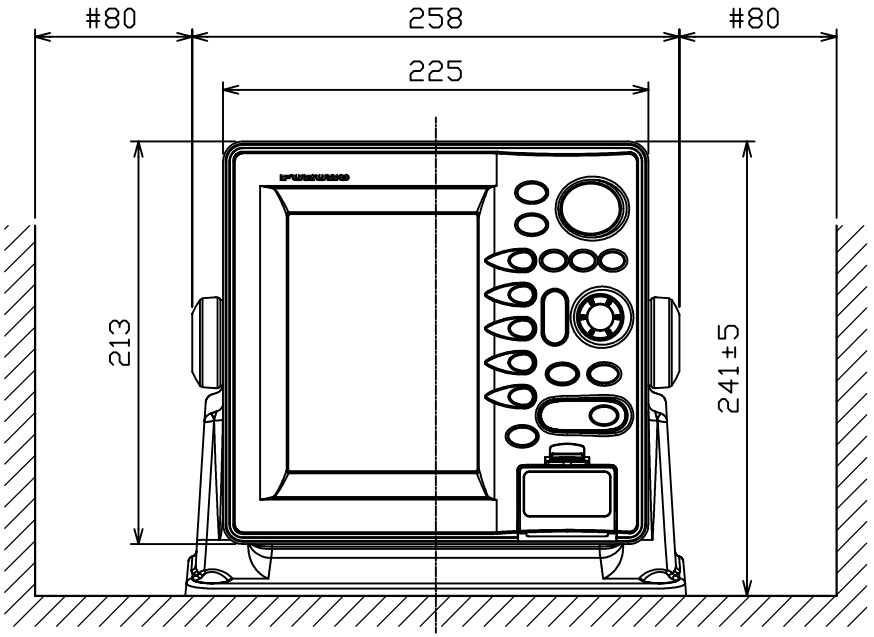


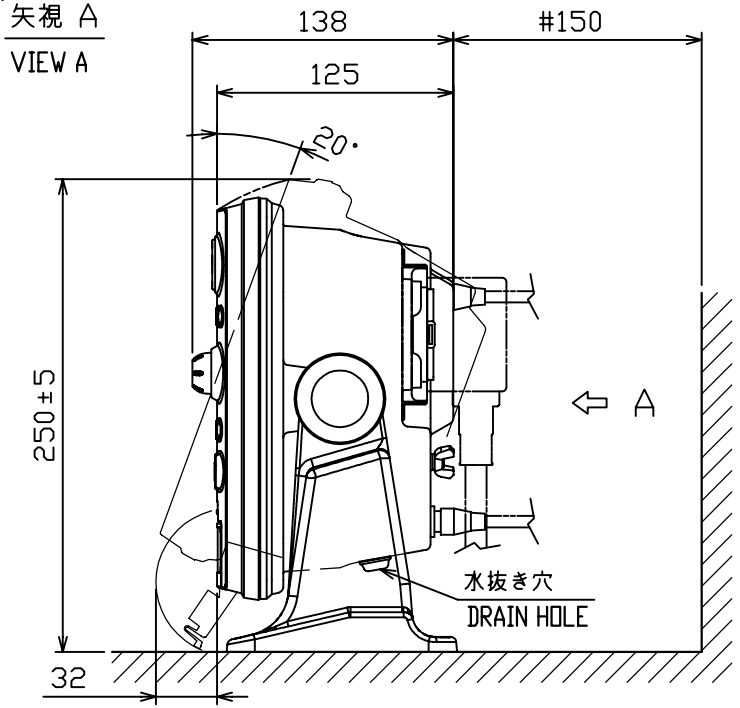


矢視 A
VIEW A

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

表 1 TABLE 1





注 記 1）#印寸法は最小サービス空間とする。
2）指定外寸法公差は表１による。
3）取付用ネジは＋トラスタッピンネジ呼び径５×２０を使用のこと。

NOTE 1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. USE TAPPING SCREWS 5x20 FOR FIXING THE UNIT.

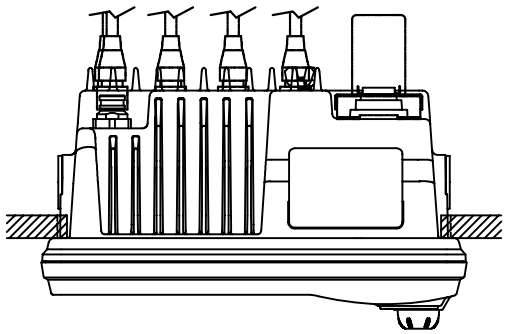
DRAWN Sep. 01 '03 E. MIYOSHI		TITLE	RDP-130/131/143
CHECKED Takahashi T.		名称	指示部（卓上装備）
APPROVED Y. Hatai	MODEL 1723C SERIES MODEL 1722/1722C SERIES		外寸図
SCALE 1/4 MASS 3.3 ±10% kg		NAME	DISPLAY UNIT (DESKTOP MOUNT)
DWG.No. C3494-G01-E	03-153-100G-5		OUTLINE DRAWING

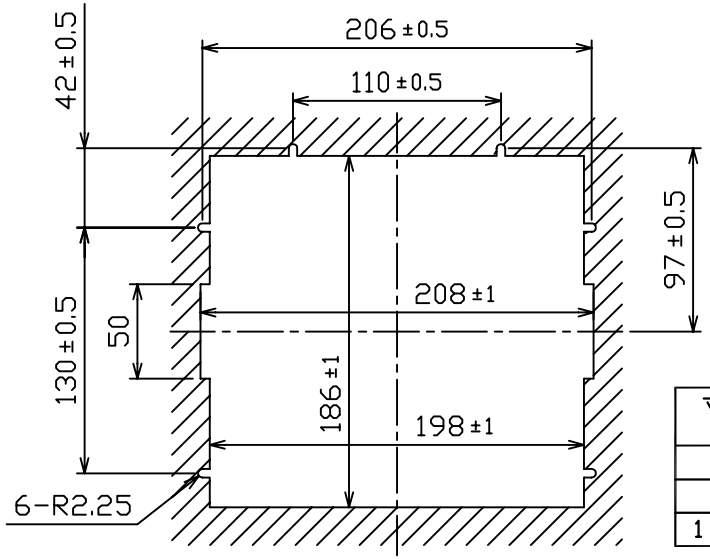
D-1

FURUNO

寸法区分（ｍｍ） DIMENSION	公差（ｍｍ） TOLERANCE
Ｌ≦５０	±１．５
５０<Ｌ≦１００	±２．５
１００<Ｌ≦５００	±３

表１　TABLE 1





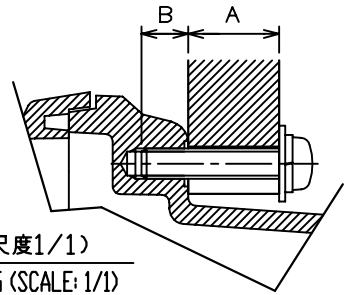
取付穴寸法図　CUTOUT DIMENSIONS

注　記　１）＃印寸法は最小サービス空間とする。
２）指定外寸法公差は表１による。
３）取付用ネジはセムスネジＢ Ｍ４×２０を使用のこと。
壁の厚さ（Ａ）は最小１１ 最大１４とする。
上記以外の壁に装備する場合、使用するネジの長さは
（Ａ+7.3）±1.5とする。（セムスネジＢを使用）
筐体にはネジ部を7mm以上いれないこと。（Ｂ≦７）

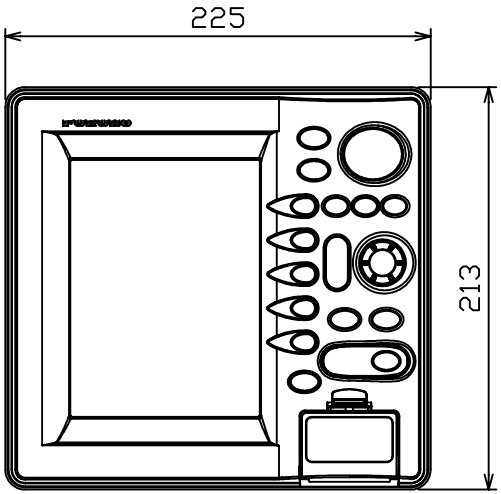
NOTE　1.　#: MINIMUM SERVICE CLEARANCE.
2.　TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3.　USE M4x20 SCREWS FOR FIXING THE UNIT.
THICKNESS A: 11≦A≦14 OR SCREWLENGTH: (A+7.3)±1.5.
DO NOT FASTEN SCREWS INTO UNIT MORE THAN 7mm. (B≦7)

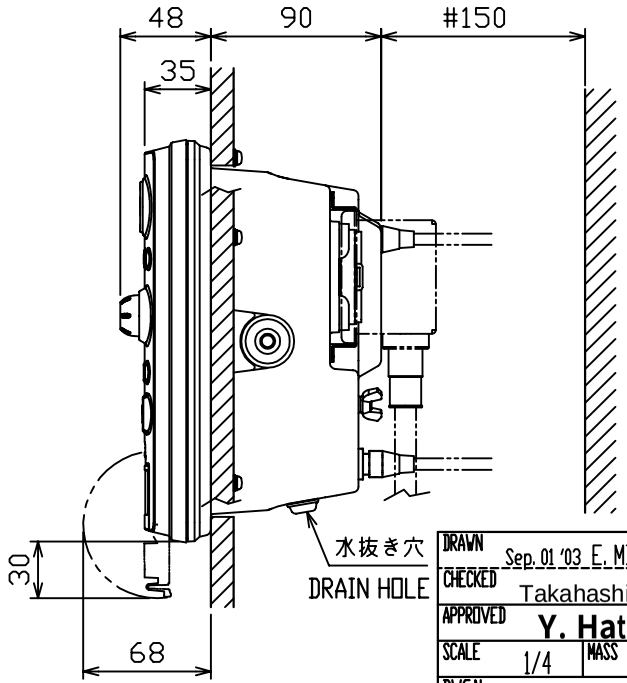
寸法区分（ｍｍ） DIMENSION	公差（ｍｍ） TOLERANCE
Ｌ≦５０	±１．５
５０<Ｌ≦１００	±２．５
１００<Ｌ≦５００	±３

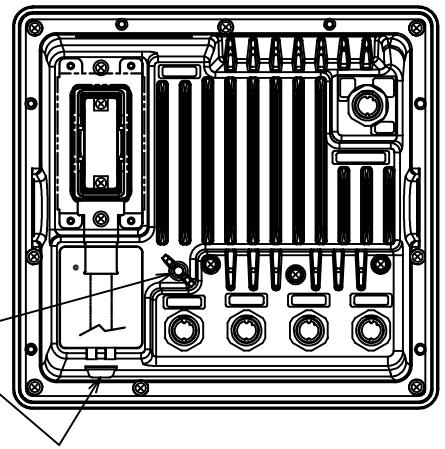
表２ TABLE 2



取付ネジ部断面（尺度1/1）
DETAIL OF FASTENING (SCALE: 1/1)







DRAWN	Sep. 01 '03 E. MIYOSHI		TITLE　RDP-130/131/143
CHECKED	Takahashi T.		名称　指示部（埋込装備）
APPROVED	Y. Hatai	MODEL 1723C SERIES MODEL 1722/1722C SERIES	外寸図
SCALE	1/4	MASS 3.0 ±10% kg	NAME　DISPLAY UNIT (FLUSH MOUNT)
DWG.No.	C3494-G02- E	03-153-110G- 4	OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

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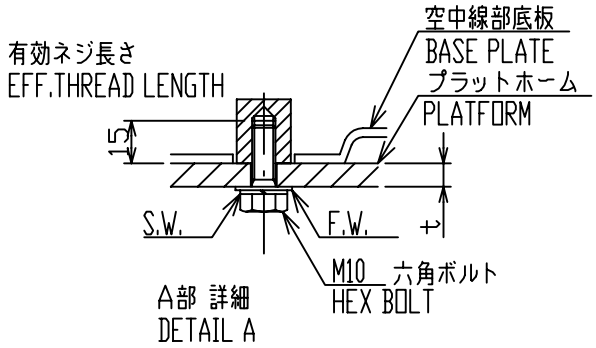
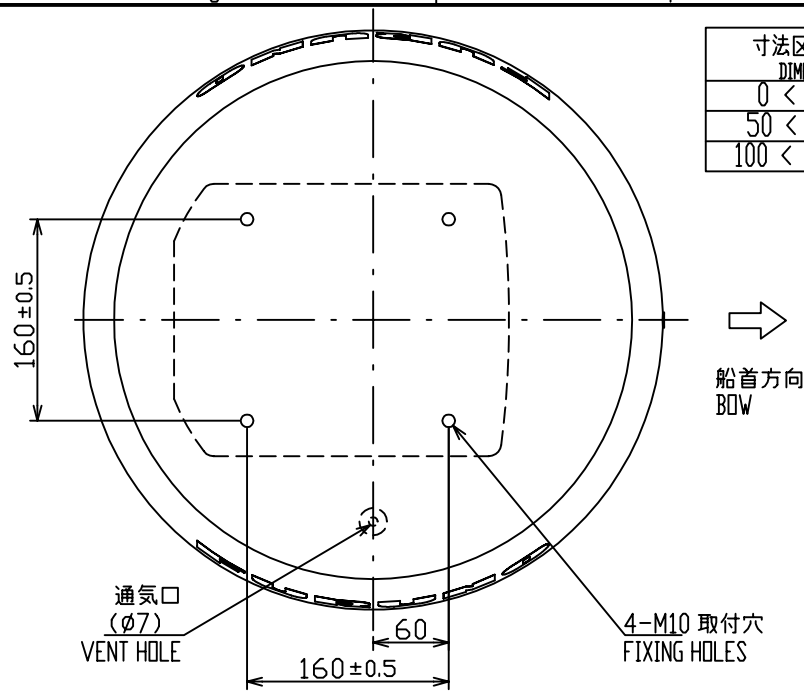
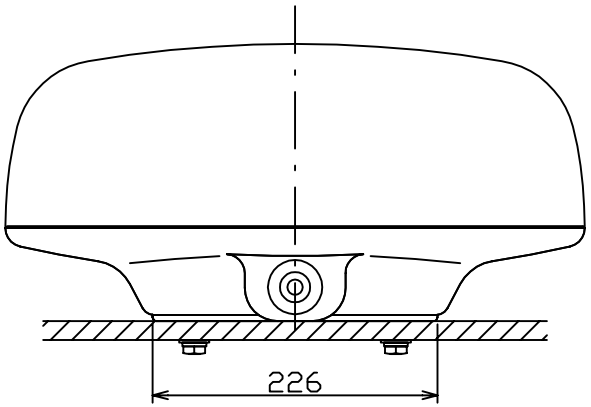
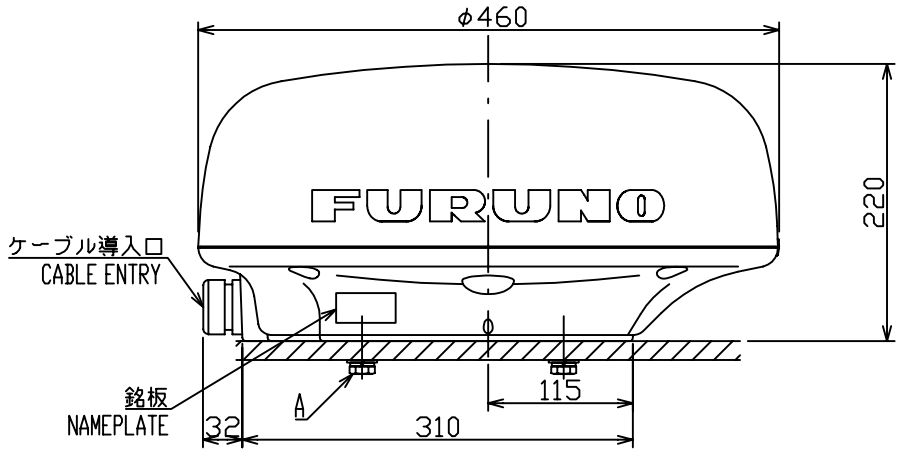
寸法区分(mm) DIMENSION	公差(mm) TOLERANCE
0 < L ≦ 50	±1.5
50 < L ≦ 100	±2.5
100 < L ≦ 500	±3

表1 TABLE 1









MODEL	MASS (kg ±10%)
RSB-0087/0087A	4.9
RSB-0094	5.2
RSB-0095	5.1

表2 TABLE 2

注記
1) 指定外の寸法公差は表1による。
2) 取付はM10ボルトを使用のこと。
ネジ長さは板厚tに応じて、20 (t≦5)または25 (5<t≦10)とする。

NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. USE M10 BOLTS FOR FIXING UNIT.
THREAD LENGTH: 20 (t≦5) OR 25 (5<t≦10), t: THICKNESS OF PLATFORM

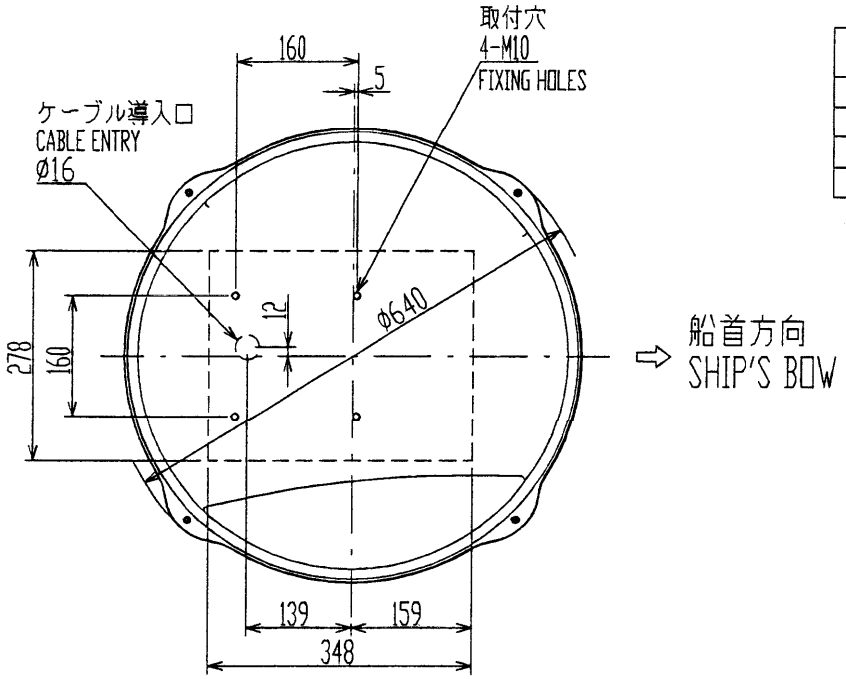
DRAWN July.16.'03 H. MAKI		TITLE	RSB-0087/0087A/0094/0095
CHECKED Takahashi T.	MODEL 1715 MODEL 1823C	名称	空中線部
APPROVED Y. Hatai	MODEL 1722/1722C MODEL 1712		外寸図
SCALE 1/6	MASS TABLE 2 表2 kg	NAME	ANTENNA UNIT
DWG.No. C3489-G02- F	03-161-100G-3		OUTLINE DRAWING

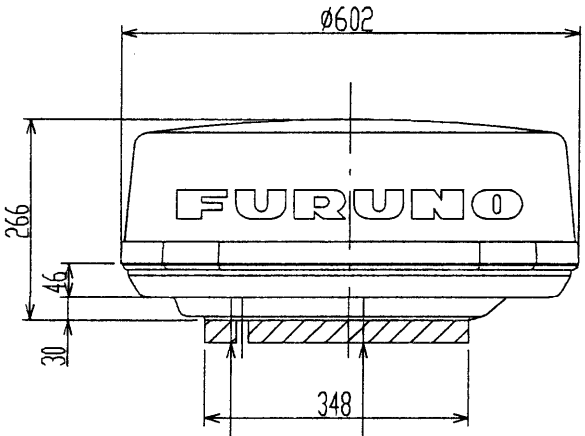
FURUNO ELECTRIC CO., LTD.

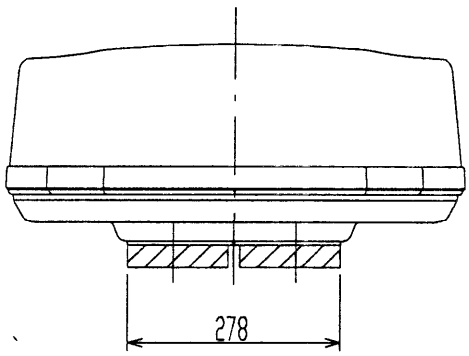
D-3

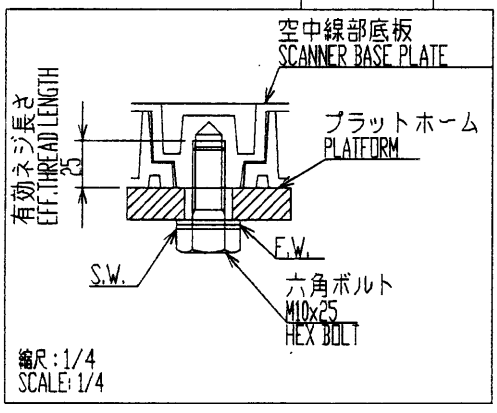
表1 TABLE 1

寸法区分(mm) DIMENSION	公差(mm) TOLERANCE
0 < L ≦ 50	±1.5
50 < L ≦ 100	±2.5
100 < L ≦ 500	±3
500 < L ≦ 1000	±4









注記
1）指定外の寸法公差は表1による。
TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
2）コンパス安全距離
COMPASS SAFE DISTANCE.

スタンダード STANDARD	1.4 m
ステアリング STEERING	1.1 m

DRAWN Sep. 21 '01 T.YAMASAKI			TITLE RSB-0071
CHECKED Sep.21'01 Y.K!	MODEL 1833/1833C MODEL 1732/1732C		名称 空中線部
APPROVED Sep.21'01 Y.K!	RS-1000 MODEL 1832		外寸図
SCALE 1/10	MASS 8 ±10% kg		NAME SCANNER UNIT
DWG.No. C3441-G01-E	03-136-6001-G2		OUTLINE DRAWING

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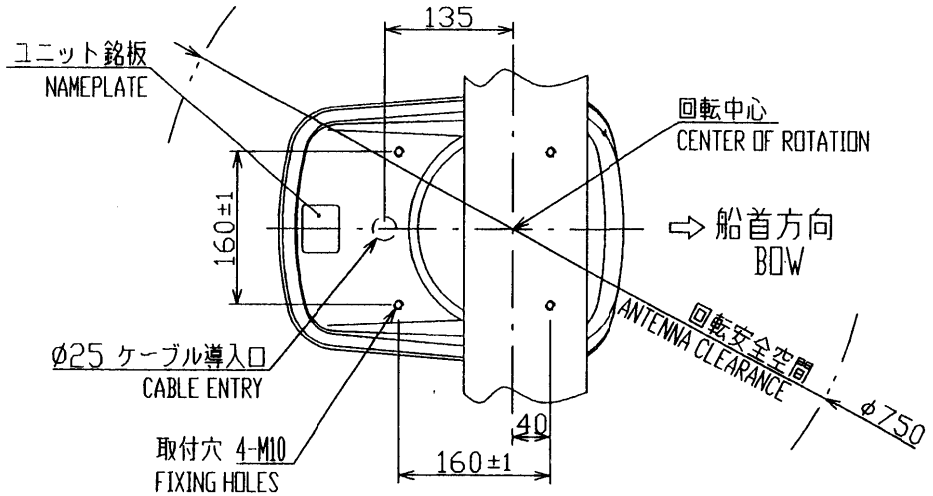


取付詳細図 DETAIL OF INSTALLATION

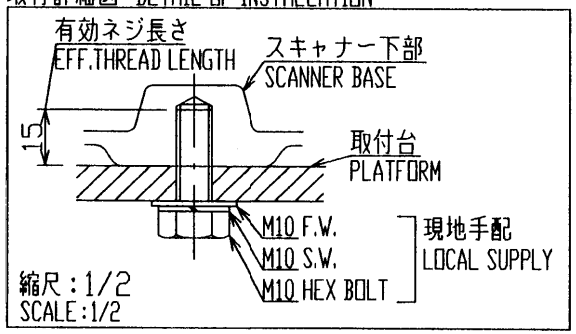
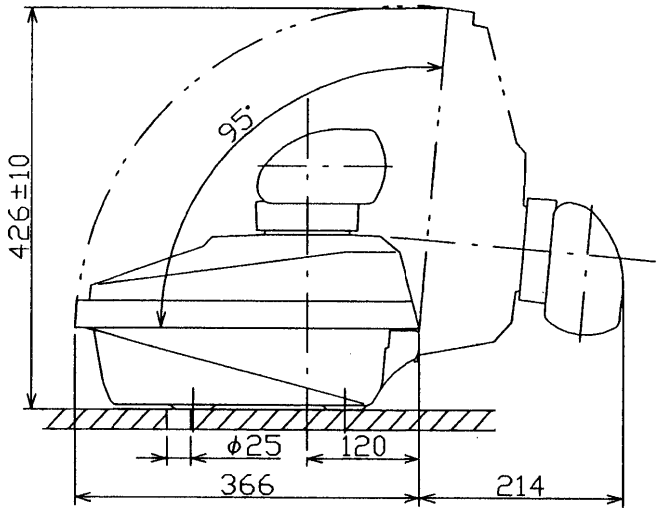


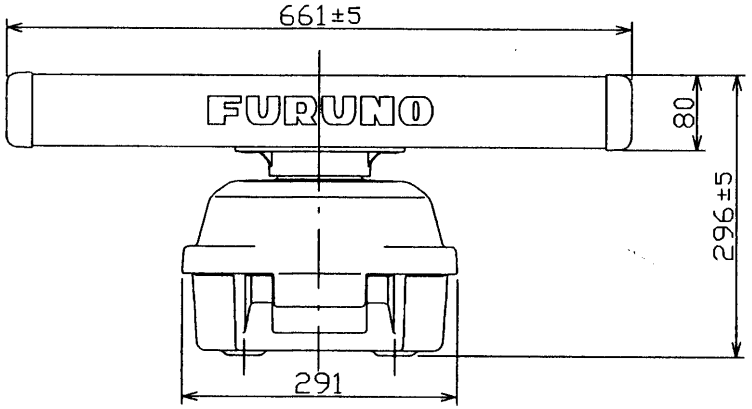
表1 TABLE 1

寸法区分(mm) DIMENSION	公差(mm) TOLERANCE
0<L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4

表2 TABLE 2

スタンダード STANDARD	1.7 m
ステアリング STEERING	1.3 m





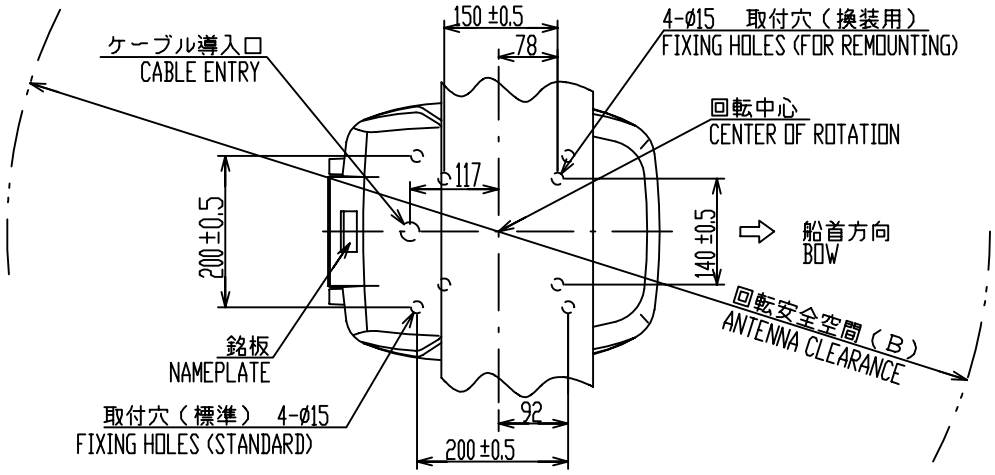
注 記 1) 指定外の寸法公差は表1による。
2) 取付用ネジは、M10ボルトを使用のこと。

NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
2. USE M10 BOLTS FOR FIXING THE UNIT.

DRAWN May 20 '02 T. YAMASAKI			TITLE RSB-0047
CHECKED 02/5/20 Y.K.	MODEL 1742/1742C MODEL 1751 MODEL 1750		名称 空中線部
APPROVED 02/5/20 Y.K.			外寸図
SCALE 1/8	MASS 11 ±10% kg		NAME ANTENNA UNIT
DWG.No. C3343-G01-E	03-153-3006-0		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO



注 記

1） 取付はM12ボルトを使用のこと。
2） 指定外寸法公差は表2による。
3） 本機取付台にø25-30のケーブル貫通穴を開ける。

NOTE

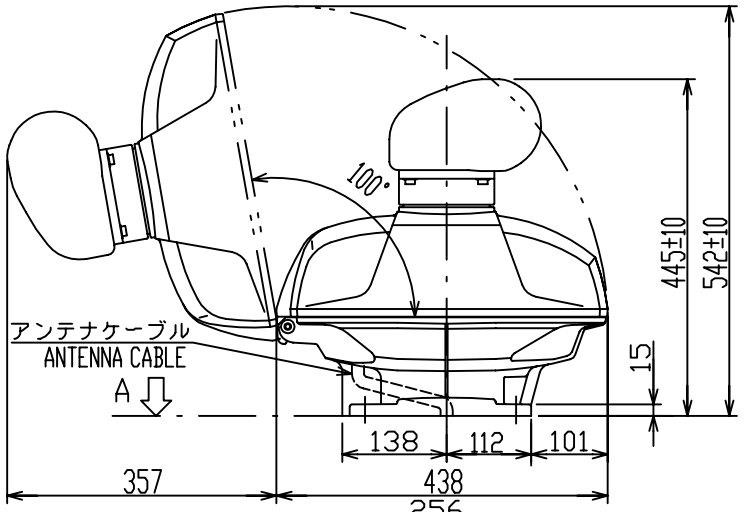
1. USE M12 BOLTS FOR FIXING THE UNIT.
2. TABLE 2 INDICATES TOLERANCE OF DIMENSIONS.
3. MAKE A HOLE ø25-30 ON MOUNTING MAST FOR CABLE PASS.

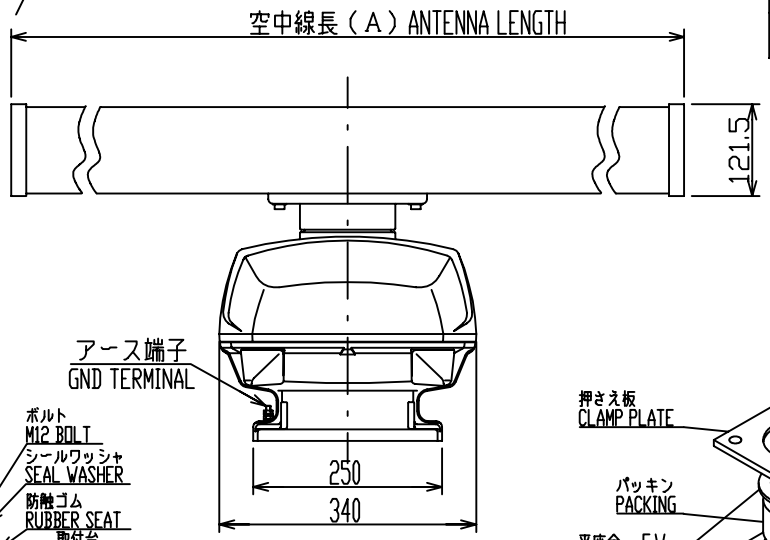
寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1．5
50<L≦100	±2．5
100<L≦500	±3
500<L≦1000	±4
1000<L≦2000	±5

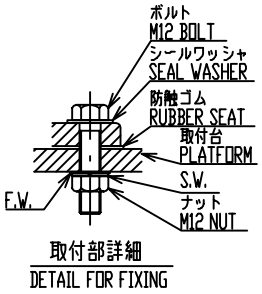
表 2 TABLE 2

種 類 TYPE	XN10A	XN12A
空中線長(A) LENGTH (mm)	1036±10	1255±10
回転安全空間(B) CLEARANCE (mm)	1200	1400
質 量 (kg) MASS (±10%)	22	23

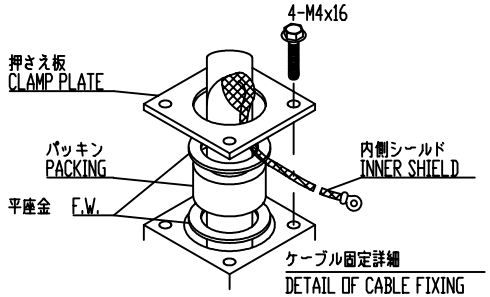
表 1 TABLE 1



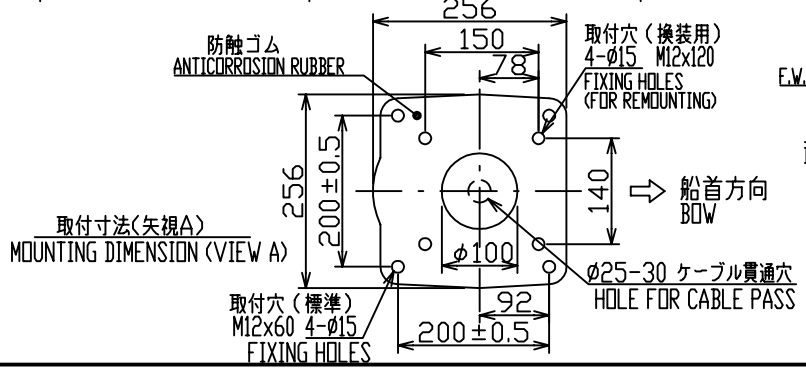




取付部詳細
DETAIL FOR FIXING



ケーブル固定詳細
DETAIL OF CABLE FIXING



取付寸法(矢視A)
MOUNTING DIMENSION (VIEW A)

DRAWN Sep. 24 '02 T. YAMASAKI		TITLE	RSB-0070/0073
CHECKED Sep. 24 '02 Y.KIMURA		名称	空中線部
APPROVED Sep. 24, '02 Y. Kimura	MODEL 1933 MODEL 1762/C		外寸図
SCALE 1/10 MASS 表2参照 SEE TABLE 2		NAME	ANTENNA UNIT
DWG.No. C3500-G01- B	03-153-300G-0		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

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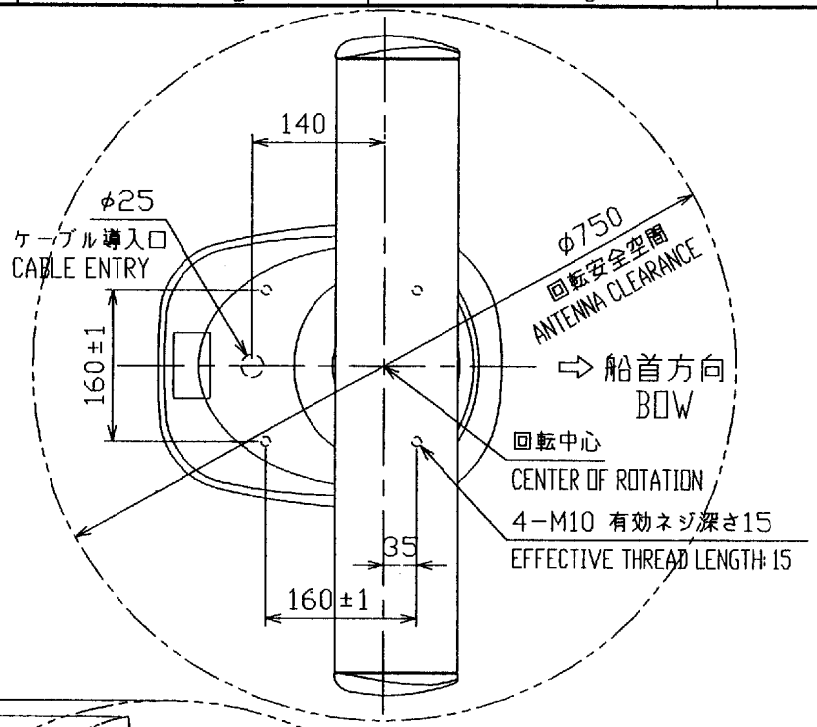
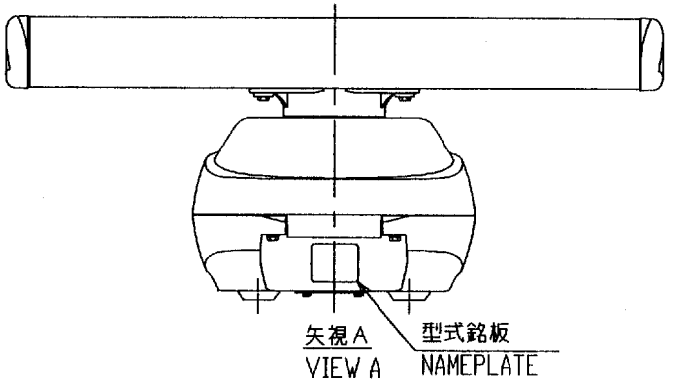
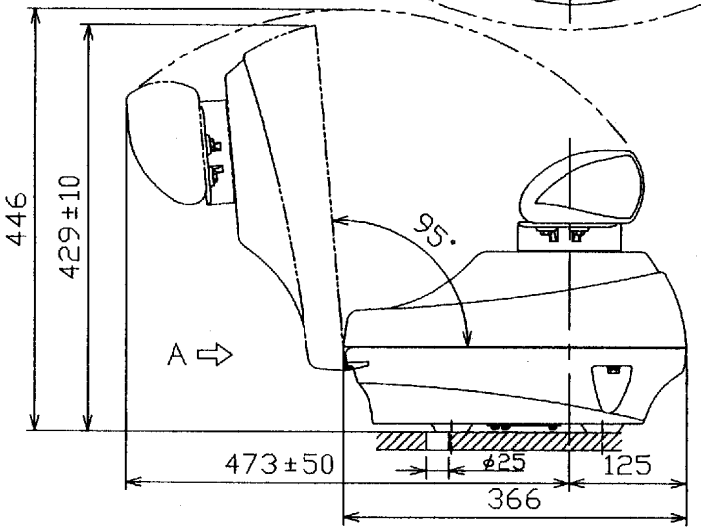


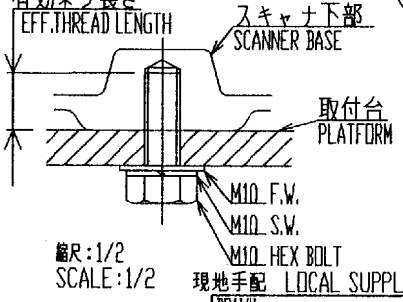
寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4

表1 TABLE 1

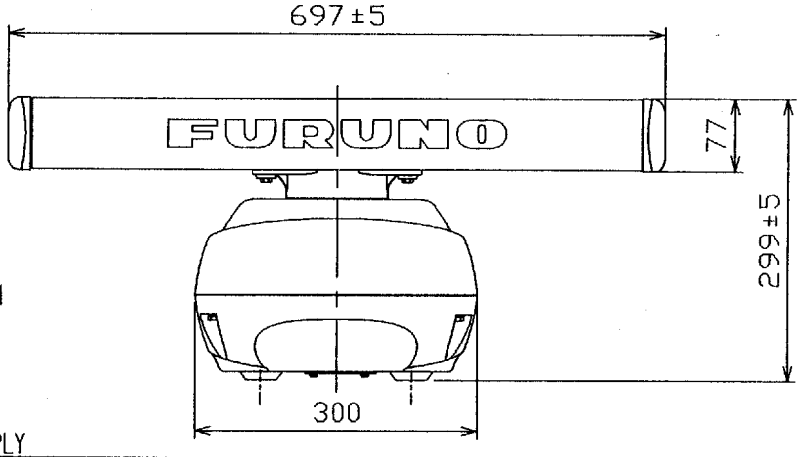




取付詳細図 DETAIL OF INSTALLATION



縮尺:1/2
SCALE:1/2



注 記 1）指定外の寸法公差は表1による。
2）取付用ネジはM10ボルトを使用のこと。

NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
2. USE M10 BOLTS FOR FIXING THE UNIT.

DRAWN Feb.28'02 T.YAMASAKI		TITLE	RSB-0091-069
CHECKED Feb.28'02 K.K		名称	空中線部
APPROVED Feb.28'02 K.K	MODEL 1752/1752C		外寸図
SCALE 1/8 MASS 14 ±10% kg		NAME	ANTENNA UNIT
DWG.No. C3508-G01-B	03-157-3006-3		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

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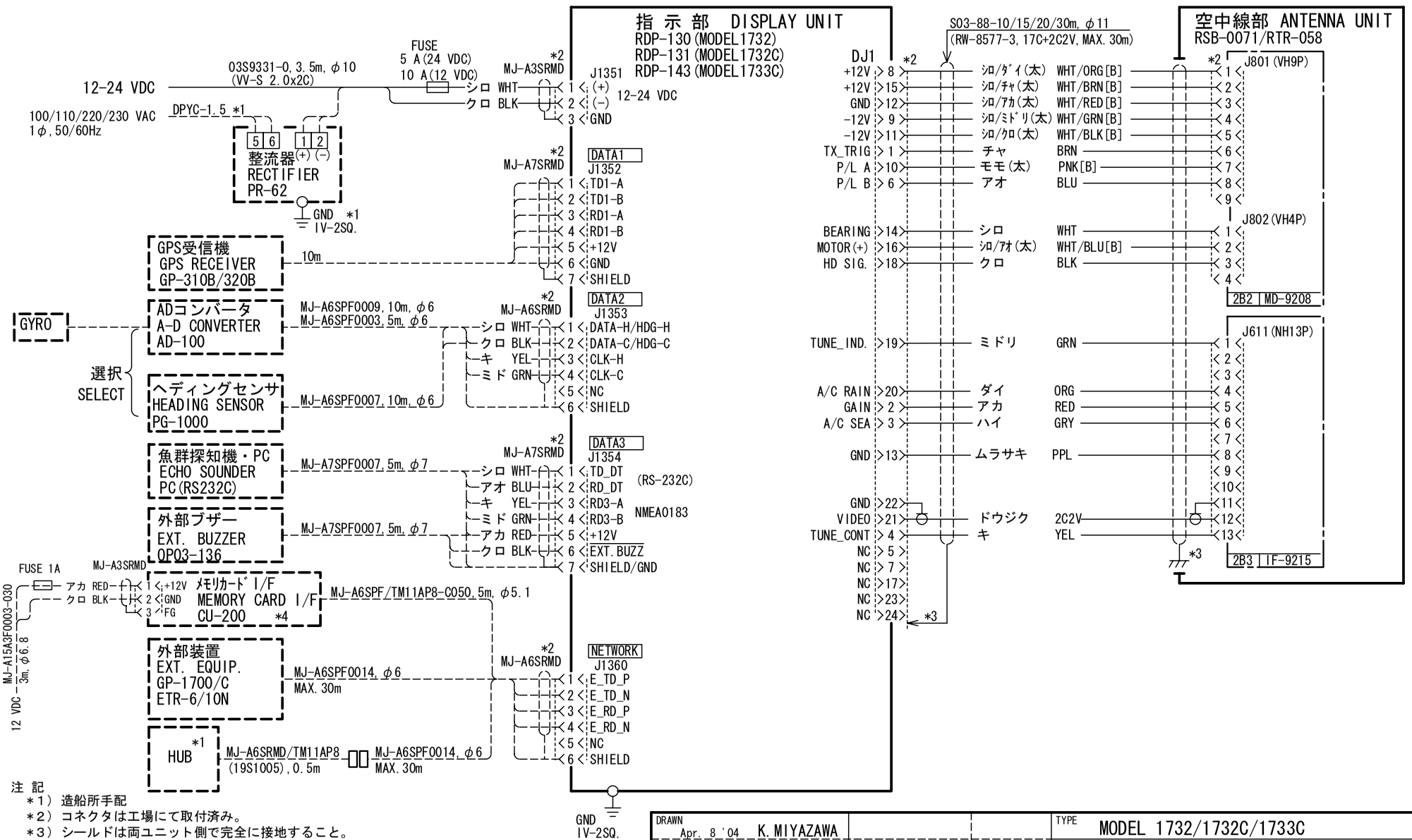


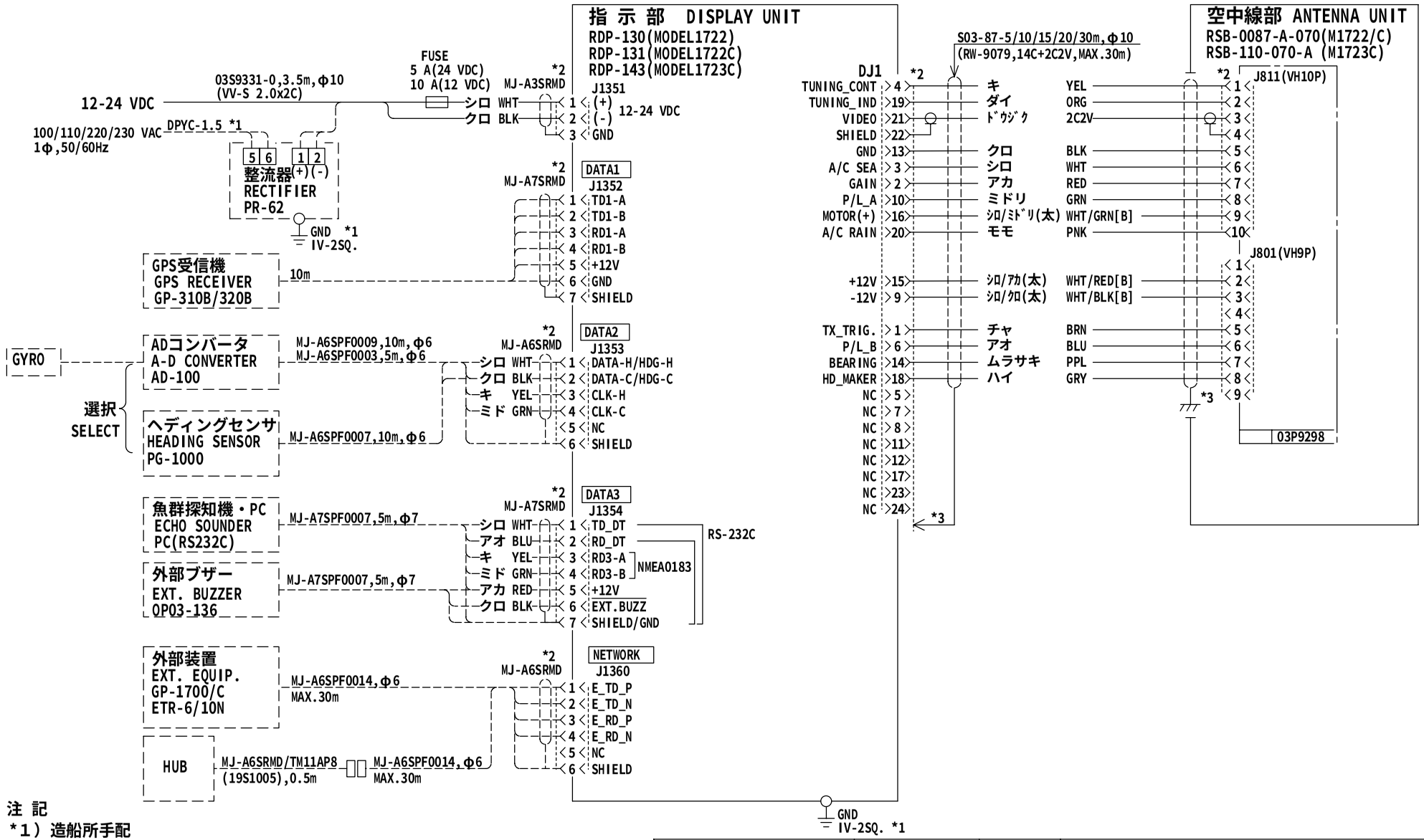
注 記
*1) 造船所手配
*2) コネクタは工場にて取付済み。
*3) シールドは両ユニット側で完全に接地すること。
*4) 輸出仕様のみ。

NOTE
*1. SHIPYARD SUPPLY
*2. CONNECTOR PLUG FITTED AT FACTORY.
*3. SHIELD SHOULD BE EFFECTIVELY GROUNDED AT BOTH UNIT ENDS.
*4. OVERSEAS SPECIFICATION ONLY.

DRAWN Apr. 8 '04 K.MIYAZAWA			TYPE MODEL 1732/1732C/1733C
CHECKED TAKAHASHI.T			名称 船舶用レーダー
APPROVED Y. Hatai			相互結線図
SCALE	MASS kg		NAME MARINE RADAR
DWG. No. C3496-C01- J	03-153-6002- 2		INTERCONNECTION DIAGRAM

FURUNO ELECTRIC CO., LTD.

FURUNO



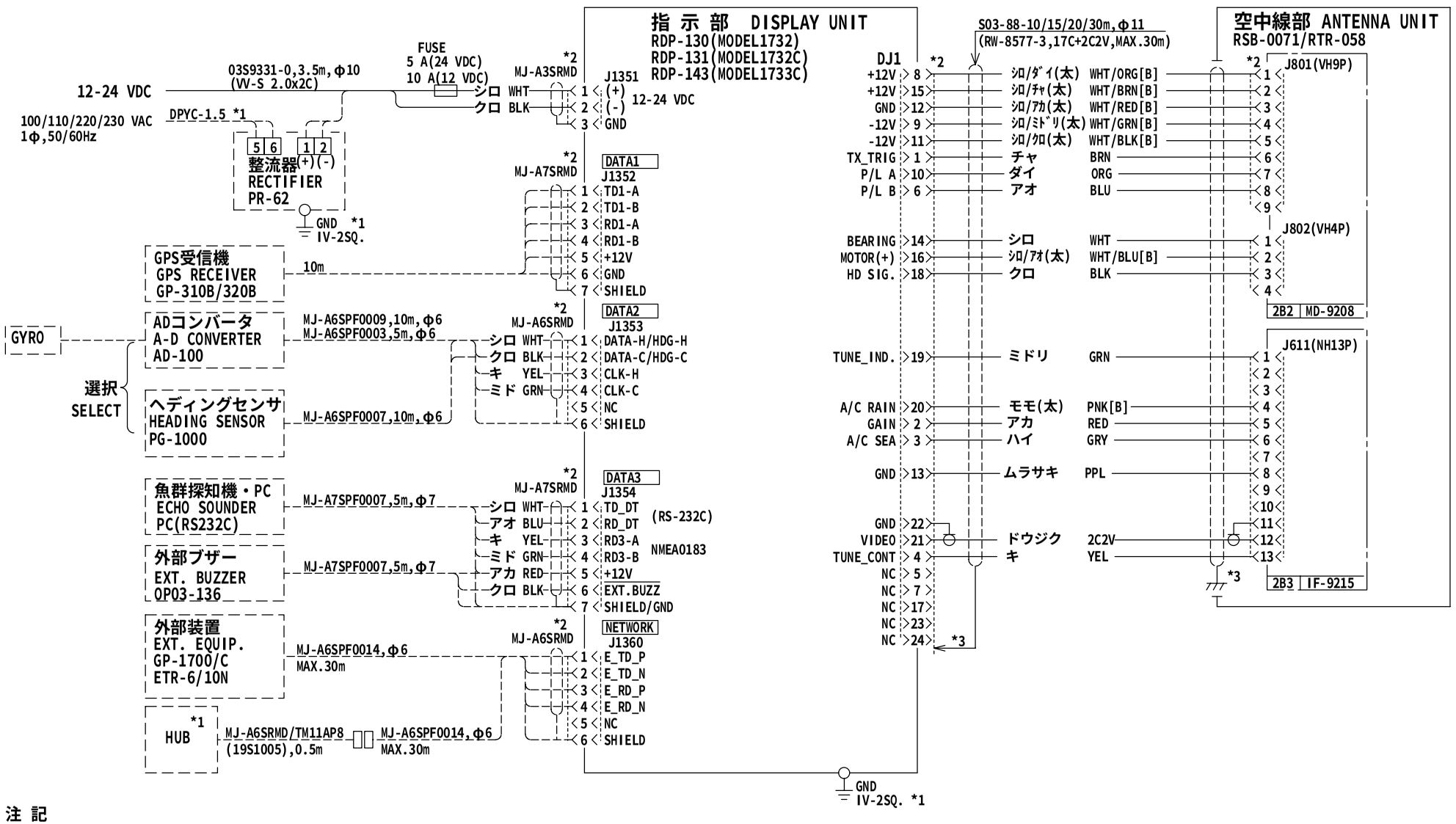
注 記
*1）造船所手配
*2）コネクタは工場にて取付済み。
*3）シールドは両ユニット側で完全に接地すること。

NOTE
*1. SHIPYARD SUPPLY
*2. CONNECTOR PLUG FITTED AT FACTORY.
*3. SHIELD SHOULD BE EFFECTIVELY GROUNDED AT BOTH UNIT ENDS.

DRAWN Sep. 08 '03 T.NISHINO		TYPE	MODEL 1722/1722C/1723C
CHECKED Takahashi T.		名 称	船舶用レーダー
APPROVED Y. Hatai			相互結線図
SCALE / MASS kg		NAME	MARINE RADAR
DWG.No. C3494-C01- J	03-153-6001- 2		INTERCONNECTION DIAGRAM

FURUNO ELECTRIC CO., LTD.

FURUNO



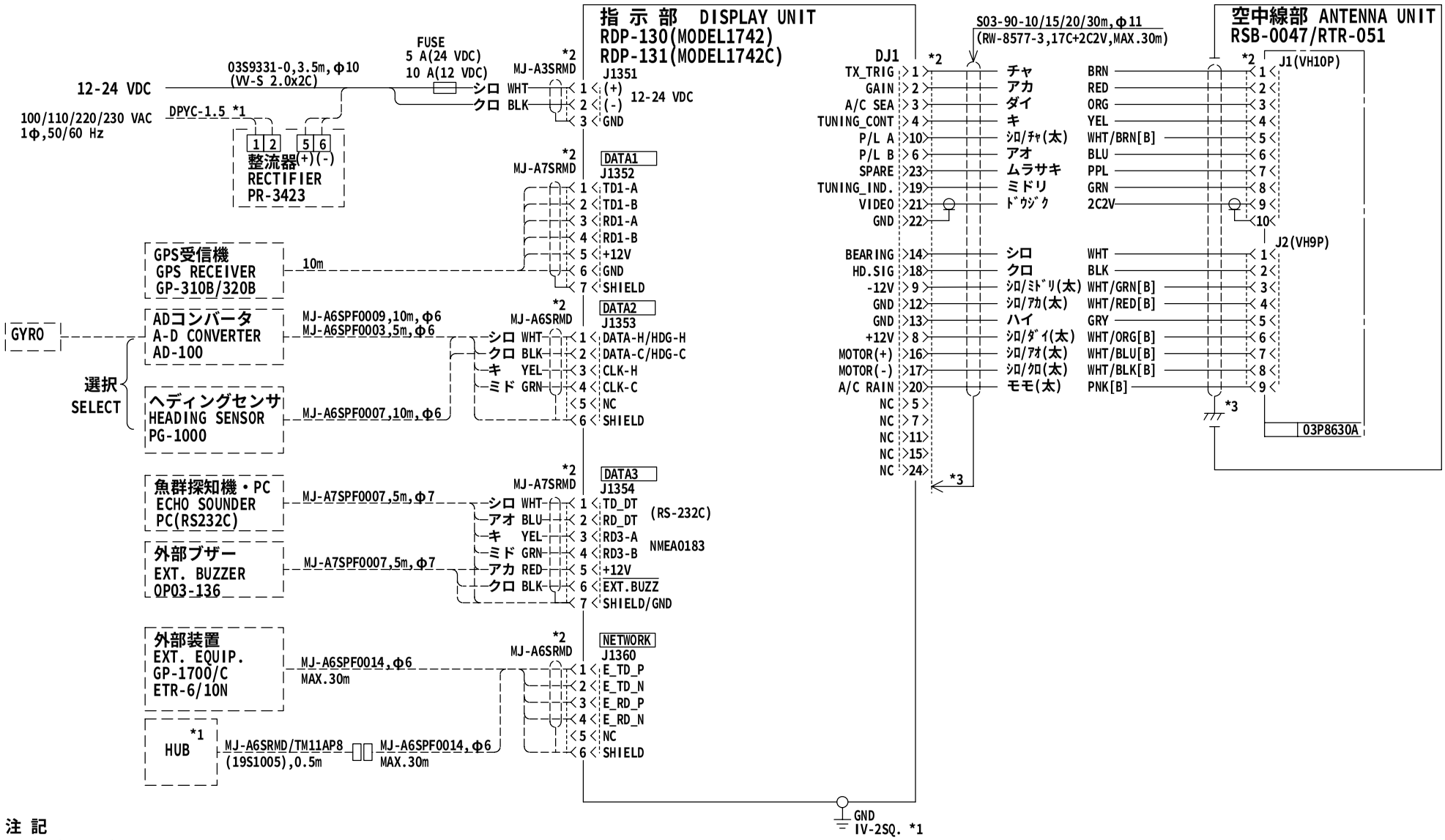
注 記
*1）造船所手配
*2）コネクタは工場にて取付済み。
*3）シールドは両ユニット側で完全に接地すること。

NOTE
*1. SHIPYARD SUPPLY
*2. CONNECTOR PLUG FITTED AT FACTORY.
*3. SHIELD SHOULD BE EFFECTIVELY GROUNDED AT BOTH UNIT ENDS.

DRAWN Sep. 08 '03 T.NISHINO			TYPE MODEL 1732/1732C/1733C
CHECKED Takahashi T.			名 称 船舶用レーダー
APPROVED Y. Hatai			相互結線図
SCALE	MASS kg		NAME MARINE RADAR
DWG.No. C3496-C01- G	03-153-6002- 2		INTERCONNECTION DIAGRAM

FURUNO ELECTRIC CO., LTD.

FURUNO



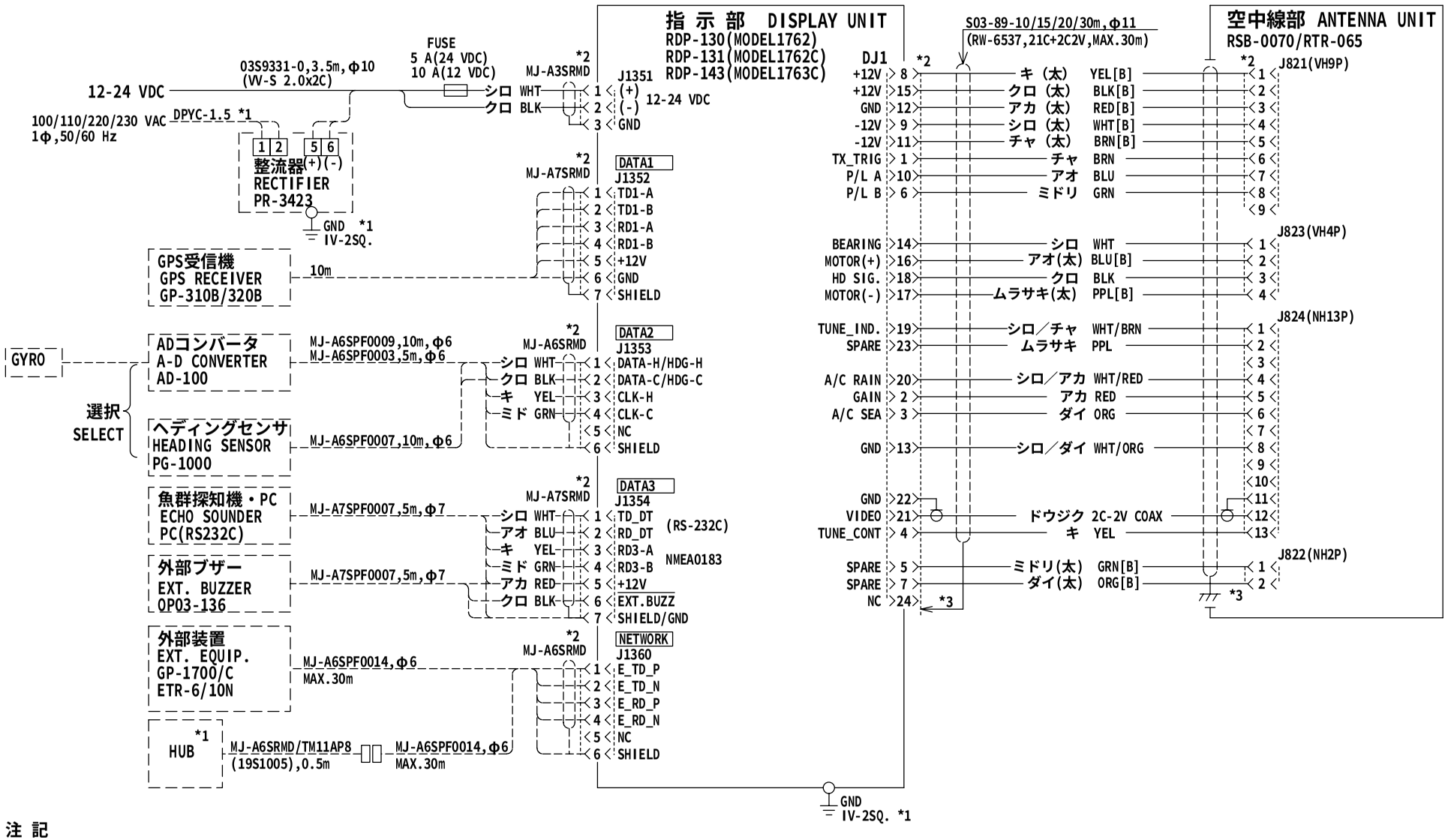
注 記
*1）造船所手配
*2）コネクタは工場にて取付済み。
*3）シールドは両ユニット側で完全に接地すること。

NOTE
*1. SHIPYARD SUPPLY
*2. CONNECTOR PLUG FITTED AT FACTORY.
*3. SHIELD SHOULD BE EFFECTIVELY GROUNDED AT BOTH UNIT ENDS.

DRAWN Sep. 08 '03 T.NISHINO		TYPE	MODEL 1742/1742C
CHECKED Takahashi T.		名 称	船舶用レーダー
APPROVED Y. Hatai			相互結線図
SCALE / MASS kg		NAME	MARINE RADAR
DWG.No. C3498-C01- F	03-153-6008- 3		INTERCONNECTION DIAGRAM

FURUNO ELECTRIC CO., LTD.

FURUNO



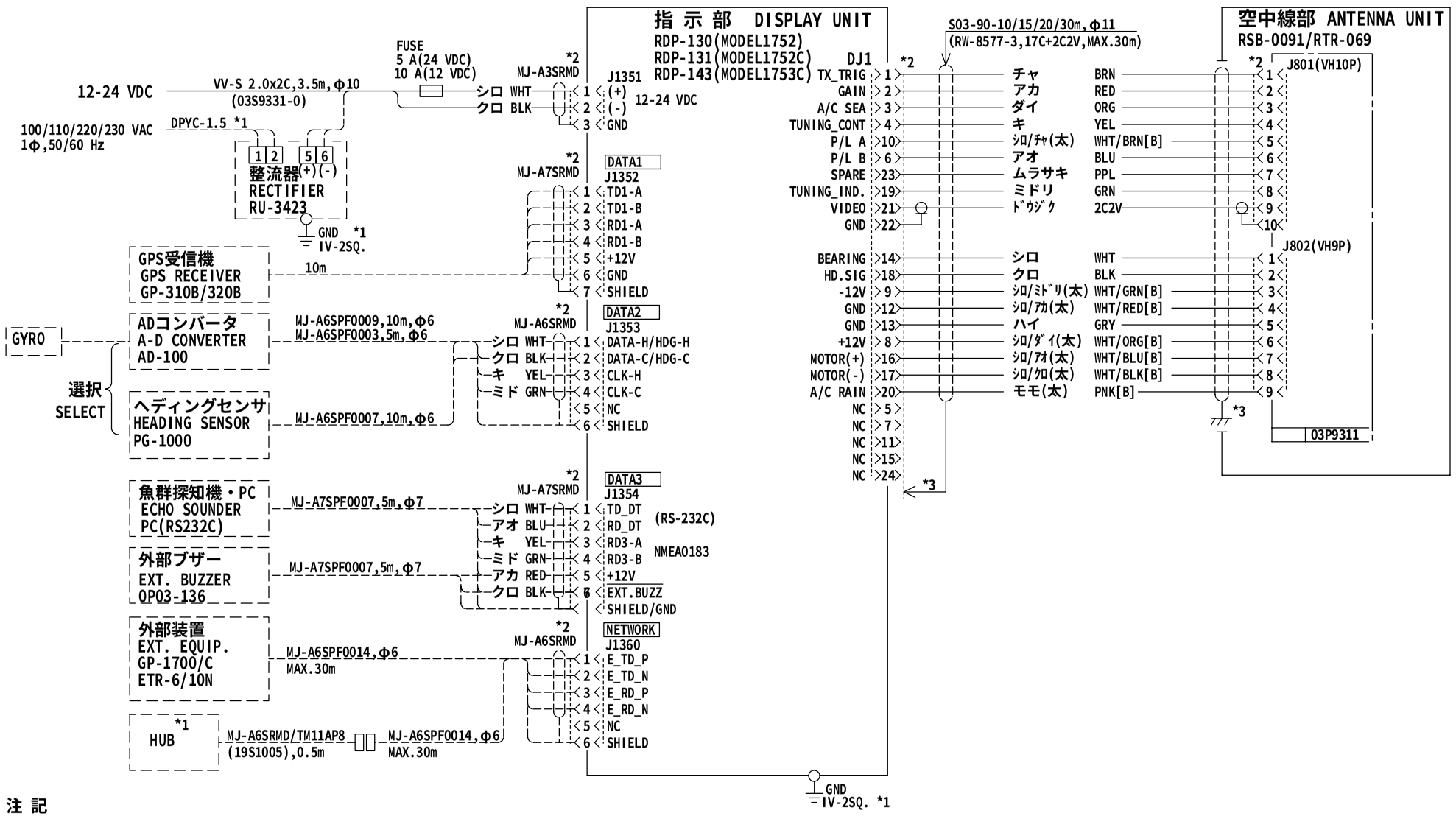
注 記
*1）造船所手配
*2）コネクタは工場にて取付済み。
*3）シールドは両ユニット側で完全に接地すること。

NOTE
*1. SHIPYARD SUPPLY
*2. CONNECTOR PLUG FITTED AT FACTORY.
*3. SHIELD SHOULD BE EFFECTIVELY GROUNDED AT BOTH UNIT ENDS.

DRAWN Sep. 08 '03 T.NISHINO		TYPE	MODEL 1762/1762C/1763C
CHECKED Takahashi T.		名 称	船舶用レーダー
APPROVED Y. Hatai			相互結線図
SCALE / MASS kg		NAME	MARINE RADAR
DWG.No. C3500-C01- G	03-153-6003- 2		INTERCONNECTION DIAGRAM

FURUNO ELECTRIC CO., LTD.

FURUNO



注 記

*1）造船所手配。

*2）コネクタは工場にて取付済み。

*3）シールドは両ユニット側で完全に接地すること。

NOTE

*1. SHIPYARD SUPPLY.

*2. CONNECTOR PLUG FITTED AT FACTORY.

*3. SHIELD SHOULD BE EFFECTIVELY GROUNDED AT BOTH UNIT ENDS.

DRAWN Sep. 08 '03 T.NISHINO		TYPE	MODEL 1752/1752C/1753C
CHECKED Takahashi T.		名 称	船舶用レーダー
APPROVED Y. Hatai			相互結線図
SCALE / MASS kg		NAME	MARINE RADAR
DWG.No. C3508-C01- G	03-157-6001-2		INTERCONNECTION DIAGRAM

FURUNO ELECTRIC CO., LTD.