

Installation Manual **MARINE RADAR MODEL 1712**

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MODEL1712



* 00080898600 *



* IME34890E20 *

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 antenna 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 antenna mast.

Turn off the power at the mains switch-board 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.

Hang the redome cover on the snap assy. after removal.

Serious injury can result if the cover falls on someone.

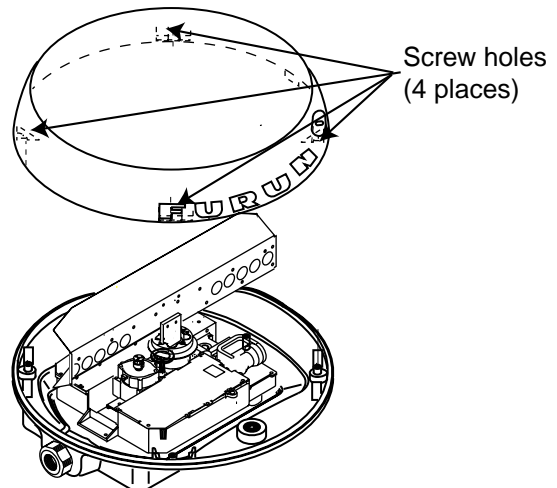
CAUTION



Ground the equipment to prevent electrical shock and mutual interference.

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.



Observe the following compass safe distances to prevent interference to a magnetic compass:

	Standard compass	Steering compass
Display unit	0.90 m	0.60 m
Antenna unit	1.25 m	0.85 m

EQUIPMENT LISTS

Standard Supply

NAME	TYPE	CODE NO.	QTY	REMARKS
Antenna Unit	RSB-0087-068	–	1	
Display Unit	RDP-134-S	–	1	
Installation Materials	CP03-20380	000-087-812	1 set	No signal cable
	CP03-21700	000-088-012		5 m signal cable
	CP03-21710	000-088-016		10 m signal cable
	CP03-20360	000-087-468		15 m signal cable
	CP03-20370	000-087-469		20 m signal cable
	CP03-20350	000-087-766		Only Installation materials for display unit
Spare Parts	SP03-09800	000-085-441	1 set	Fuse for display unit

Installation Materials

NAME	TYPE	CODE NO.	QTY	REMARKS
Signal Cable (5 m)	MJ-A10SPF0009-050	000-144-562	1	Select one, connector at both ends
Signal Cable (10 m)	MJ-A10SPF0009-100	000-144-563		
Signal Cable (15 m)	MJ-A10SPF0009-150	000-144-564		
Signal Cable (20 m)	MJ-A10SPF0009-200	000-144-565		
Power Cable Assy.	MJ-A3SPF0019-035	000-144-258	1	Connector, fuse, 3.5 m
Hex. Bolt	M10X25	000-862-308	4	For antenna unit
Dummy Film	03-118-1103-0	100-185-380	1 set	For display unit
Tapping Screw	5X20	000-802-081	4	For display unit
EMI Core	RFC-10	000-141-085	1	For signal cable
Washer Head Screw	M4X15	000-881-448	1	For signal cable
EMI Core Fixing Plate	03-146-0101-0	100-277-850	1	For signal cable

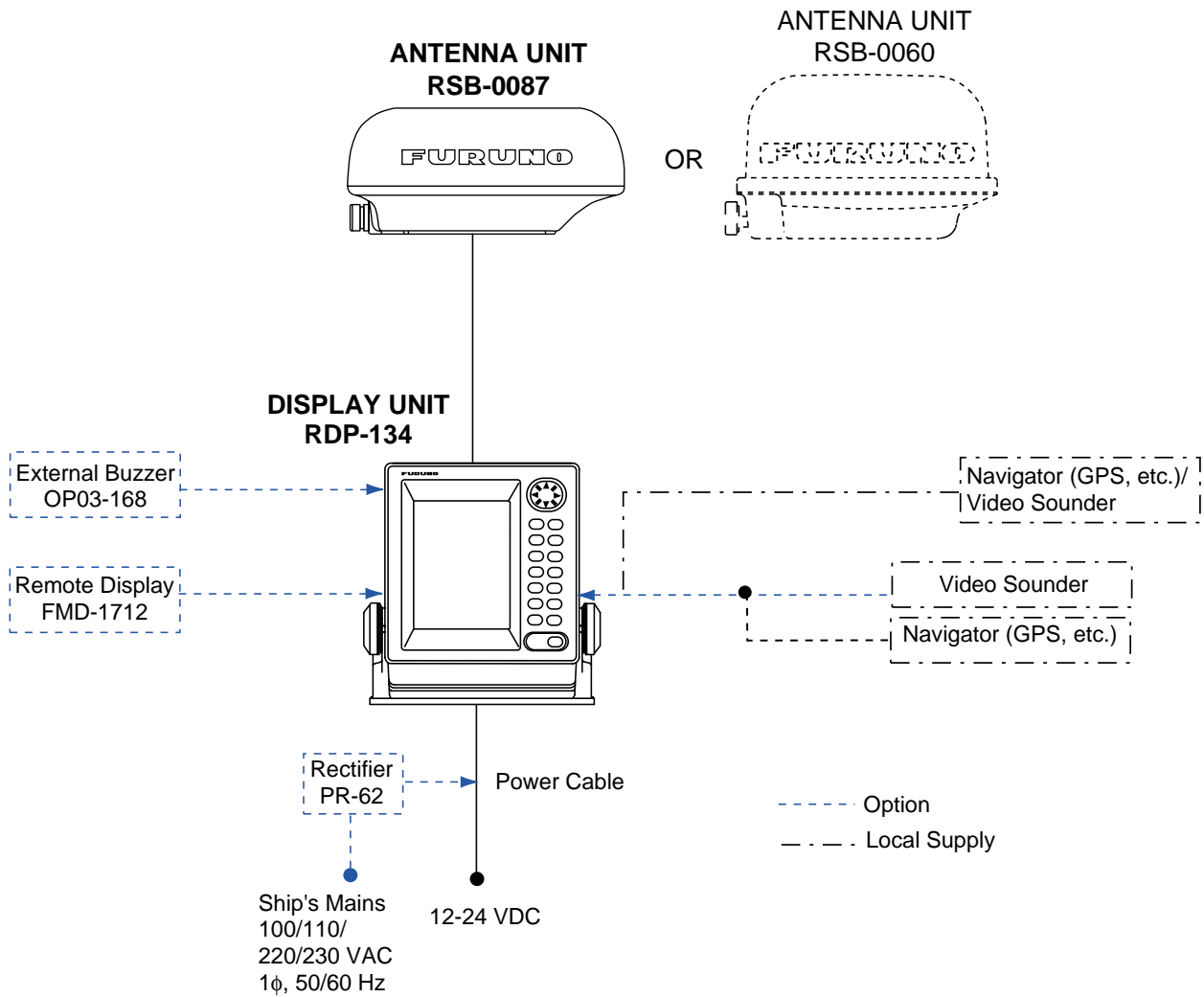
Spare parts
SP03-09800 (000-085-441)

NAME	TYPE	CODE NO.	QTY	REMARKS
Fuse	FPB0-A 5A AC125V	000-549-064	1	For display unit

Optional Equipment

NAME	TYPE	CODE NO.	QTY	REMARKS
Antenna Unit	RSB-0087-068	–	1	
	RSB-0060-068	–	1	
Cable Assy.	MJ-A6SPF0003-050	000-117-603	1	Connector at one end, 5 m
	MJ-A6SPF0009-100	000-125-236	1	Connector at one end, 10 m
Antenna Cable Assy.	MJ-A10SPF0009-300	000-144-566	1	Connector at one end, 24 V spec. only.
Radome Mounting Bracket	OP03-93	008-445-080	1	For sailboat
Remote Display	FMD-1712	-	1	
External Buzzer	OP03-168	008-462-790	1	Connector at one end, 1 m and MJ-XH connector
Rectifier	PR-62	000-013-484	1	100VAC
	PR-62	000-013-485		110VAC
	PR-62	000-013-486		220VAC
	PR-62	000-013-487		230VAC
Signal Cable	MJ-A10SPF0009-050	000-144-562	1	Connector at both ends, 5m
	MJ-A10SPF0009-100	000-144-563		Connector at both ends, 10m
	MJ-A10SPF0009-150	000-144-564		Connector at both ends, 15m
	MJ-A10SPF0009-200	000-144-565		Connector at both ends, 20m

SYSTEM CONFIGURATION



1. INSTALLATION

1.1 Antenna Unit Installation

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.

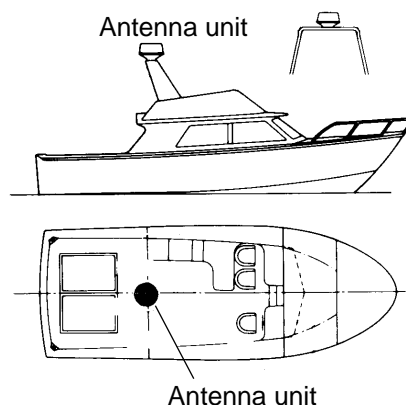


Figure 2 Typical antenna unit placement on powerboat

- 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 meters (standard compass) and 0.85 meters (steering compass) should be observed to prevent deviation of the magnetic compass.

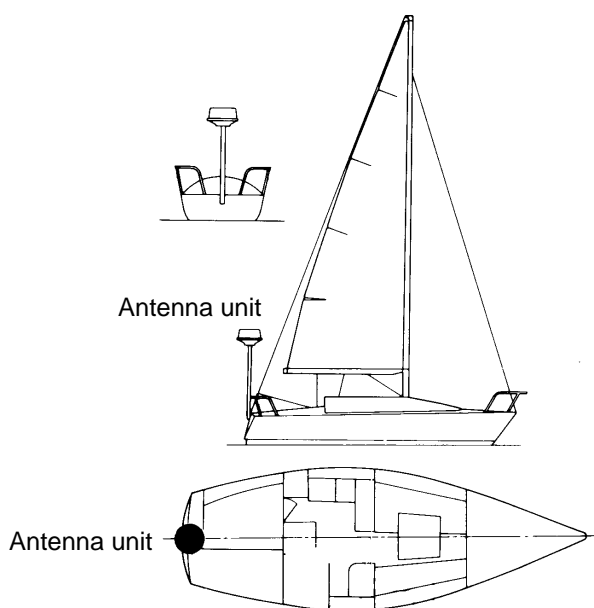


Figure 1 Typical antenna unit placement on sailboat

Mounting on a platform

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.

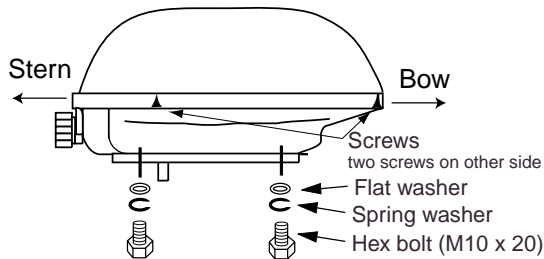


Figure 3 Antenna unit, showing location of mounting hardware

2. Construct a platform (wood, steel, or aluminum) of 5–10 mm in thickness referring to the outline drawing at back of this manual. 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 is very thick.

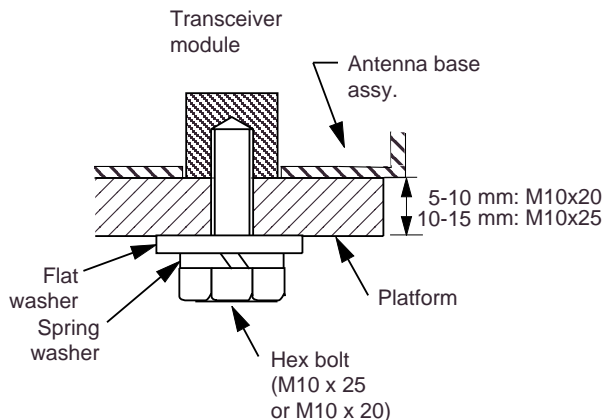


Figure 4 How to fasten the base to platform

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

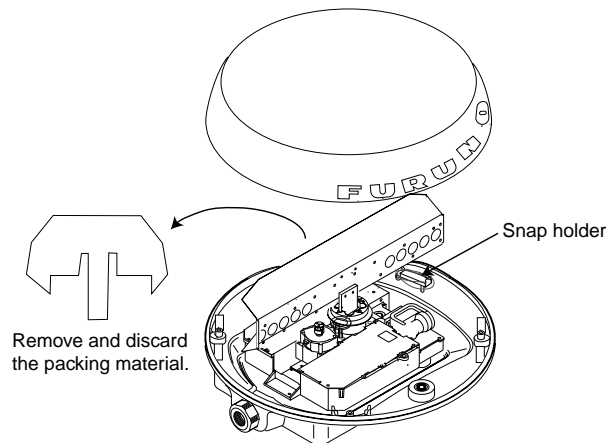


Figure 5 Antenna unit, inside view

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 assembly 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 6.

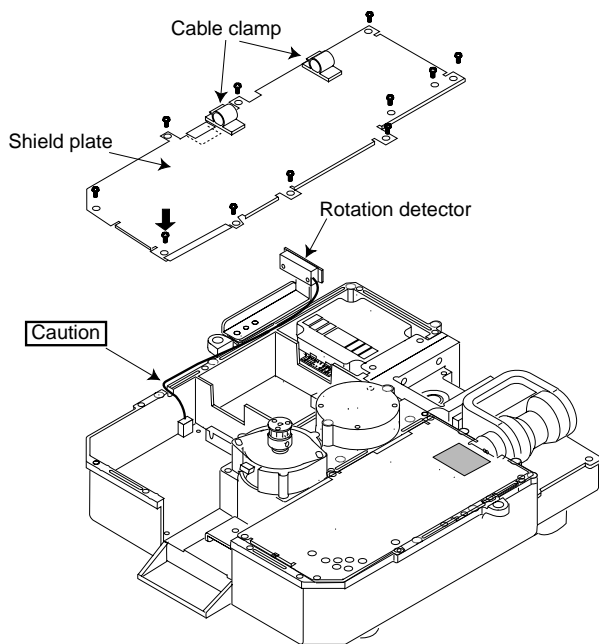


Figure 6 Antenna unit, inside view

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.

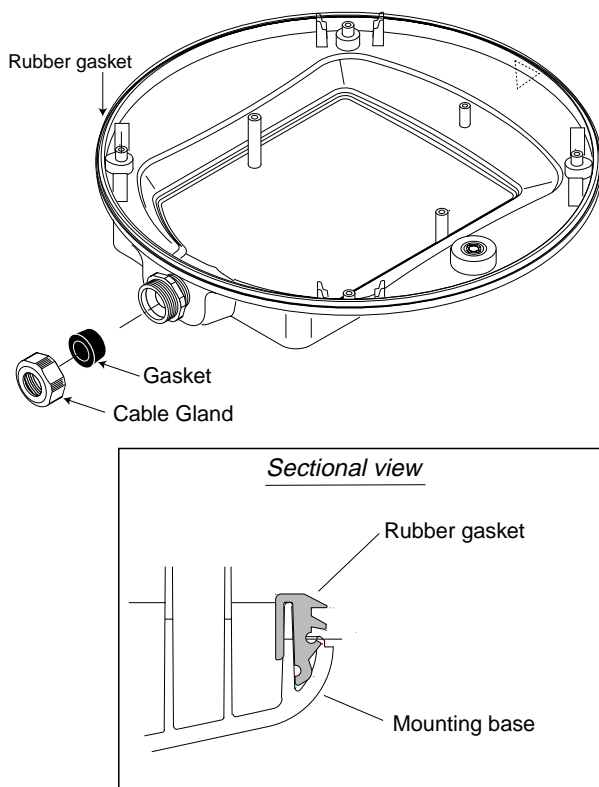


Figure 7 Antenna unit, inside view

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

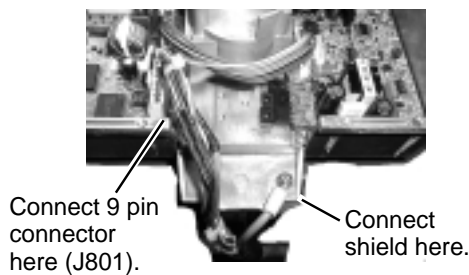


Figure 8 How to connect the antenna cable to the antenna unit

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

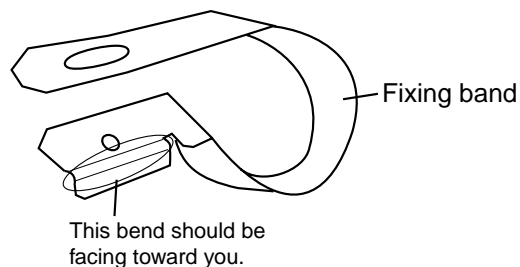


Figure 9 Fixing band

10. Referring to Figure 8, connect the 9-pin connector of the antenna cable to J801.
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 Figure 6 for details.
12. Fasten the Fixing band with Screw (supplied).

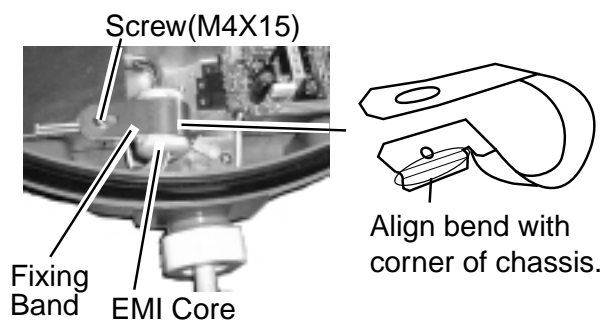


Figure 10 How to fix the EMI Core

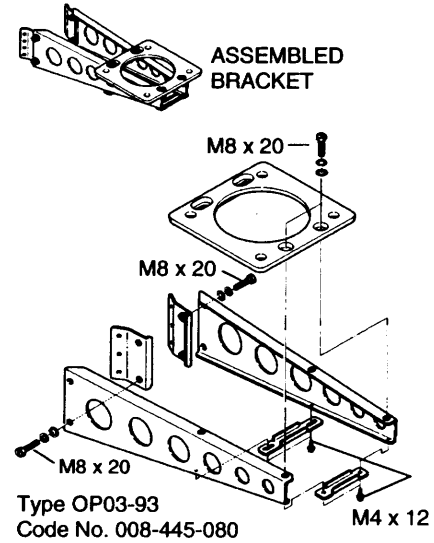
13. Follow the instructions on the label inside the mounting base to secure the snap assy.
14. Confirm that the rubber gasket is properly positioned and that the triangle mark on the radome cover is aligned with the triangle mark on the mounting base, then tighten the fixing screws for the cover. Refer to Figure 7 for positioning of rubber gasket.

Mounting using the optional mounting bracket

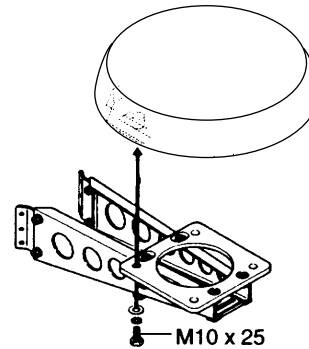
A mounting bracket for fastening the antenna unit to a mast on a sailboat is optionally available (Type OP03-93, Code No.008-445-080).

Name	Type	Code No.	Qty
Hex. bolt	M4X12	000-804-725	4
Hex. bolt	M8X20	000-805-707	8
Mounting plate	03-018-90 01-0	100-206-740	1
Support plate (1)	03-018-90 05-0	100-206-780	1
Support plate (2)	03-018-90 06-0	100-206-790	1
Bracket (1)	03-028-91 01-0	100-206-810	1
Bracket (2)	03-028-91 02-0	100-206-820	1
Fixing plate	03-028-91 03-0	100-206-830	2

1. Remove mounting hardware at the bottom of the antenna base. You may discard the hardware. 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

Figure 11 How to assemble and mount the optional mounting bracket

2. Refer to previous steps 3-14 in "Mounting on a platform".

1.2 Display Unit Installation

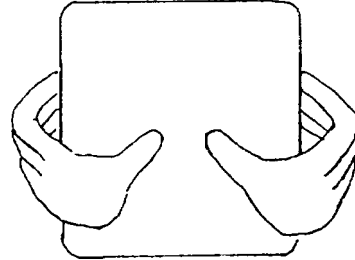
Mounting considerations

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

- Locate the display unit in a position where you can view and operate it conveniently.
- The orientation of the display unit should be so the radar screen is viewed while the operator is facing in the direction of the bow. This makes determination of your position much easier.
- The display unit is designed and constructed to be splashproof, thus it can be installed outdoors. If it is to be installed outdoors, we recommend installing it in an enclosed cabinet, for maximum protection against the marine environment.
- Even though the picture is quite legible even in bright sunlight, keep the display unit out of direct sunlight or at least shaded because of heat that can build up inside the cabinet.
- The temperature and humidity of the mounting location should be stable and moderate. No LCD can provide adequate contrast if the ambient temperature is too low or too high.
- Make sure you allow enough clearance both to get to the connectors behind the unit and to allow you to get your hands in on both sides to loosen or tighten the mounting knobs. Make sure you leave at least a foot or so of "service loop" in cables behind the unit for servicing or easy removal of the connectors.
- The compass safe distance of 0.90 meters (standard compass) and 0.60 meters (steering compass) should be observed to prevent deviation of the magnetic compass.

Removing cover

While pressing the center of the cover with your thumbs as illustrated, pull the cover towards you to remove it.



Mounting

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

1. Fix the hanger to the mounting location with four tapping screws (supplied).
2. Attach the anti-vibration pads to the hanger.
3. Fit the knob bolts and anti-vibration rubbers to the display unit.
4. Cover the unused bolt holes with the dummy films supplied.
5. Install the display unit in the hanger. Tighten the knob bolts securely.

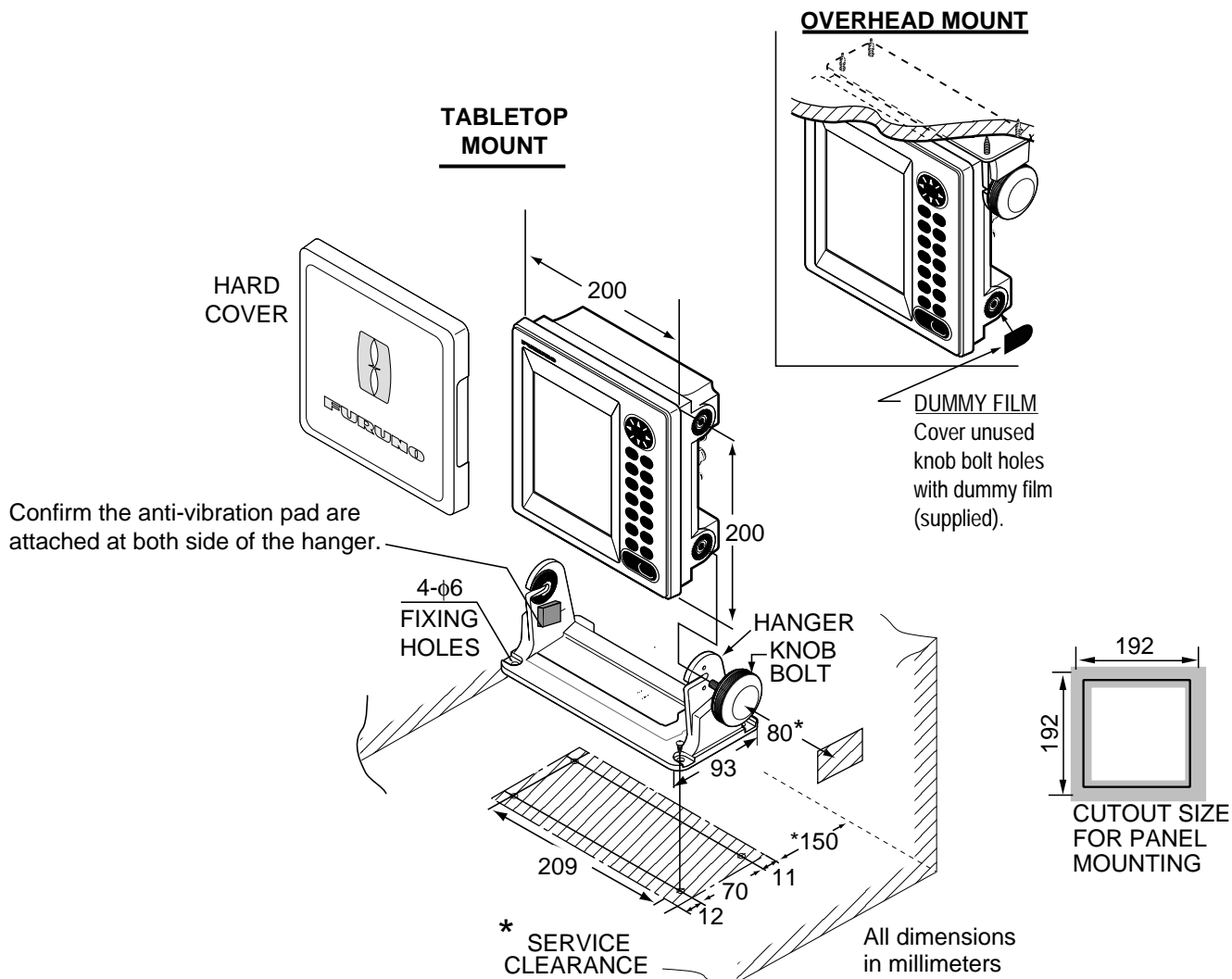


Figure 12 Mounting dimensions of display unit

2. WIRING

2.1 Connections

Connect the antenna cable, the power cable and the ground wire as shown in Figure 13.

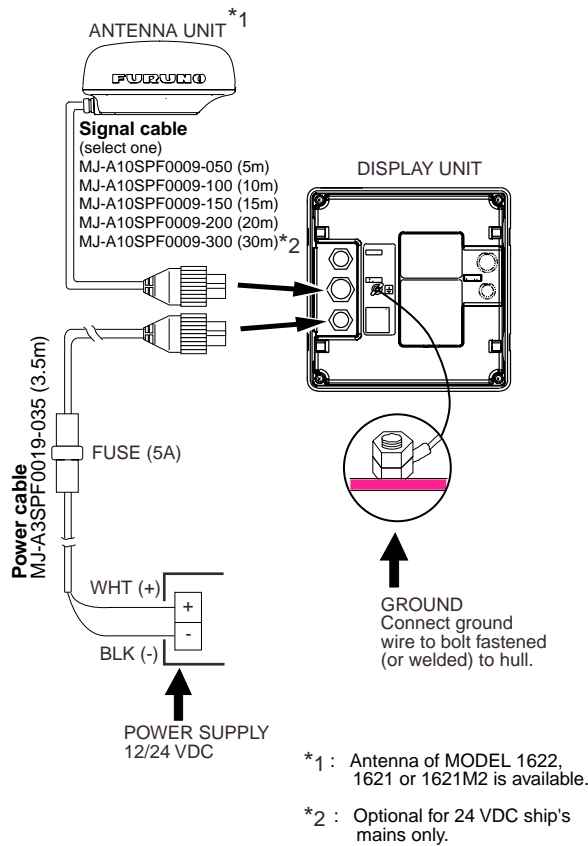


Figure 13 Connections

Connection of external equipment

Navigator/echosounder

This radar can receive the following NMEA 0183 format data sentences from a navigator or echosounder:

- GLL: Geographic position - Lat/Long
- BWR: Bearing and Distance to Waypoint - Rhumb line
- BWC: Bearing and Distance to Waypoint
- GLC: Geographic Position - Loran-C
- GTD: Geographic Position - Time Difference
- RMA: Recommended Minimum Specific Loran-C Data
- RMB: Recommended Minimum Navigation Information
- RMC: Recommended Minimum Specific GPS/Transit Data
- VTG: Track Made Good and Ground Speed
- MTW: Water Temperature
- DBT: Depth Below Transducer
- DBS: Depth Below Surface
- DPT: Depth Below Transducer with offset value
- GGA: GPS - Rx status, L/L

NMEA connection

You will need an NMEA cable to connect a video sounder or a navigator. Connect it to the NMEA connector at the rear of the radar display unit as shown below.

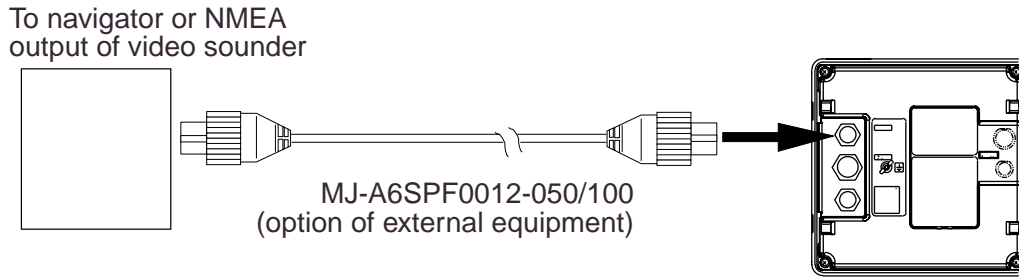


Figure 14 Navigator connection

To connect both a video sounder and a navigator, use NMEA cable MJ-A6SPF0003-050/MJ-A6SPF0009-100 (option) and solder them as shown below.

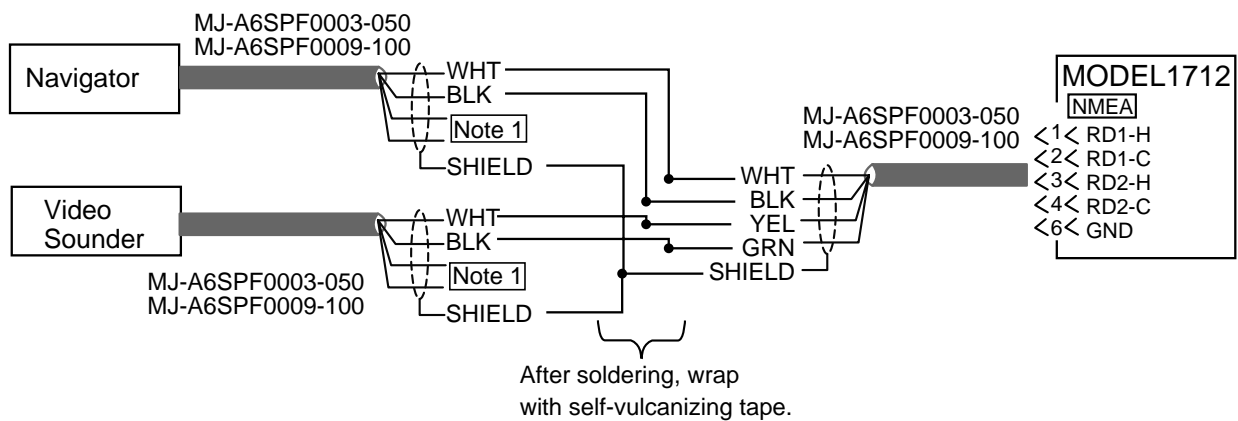


Figure 15 Connection of video sounder and navigator cables

Note 1: Tape unused cables to prevent short.

Note 2: Do not use a cross wiring-type NMEA cable which has connectors at both ends (for example, MJ-A6SPF0012-050). Miswiring can result when the one of the connectors is removed to make the connection.

To connect equipment whose NMEA output uses other than a FURUNO 6 pin NMEA connector, use NMEA cable type MJ-A6SPF0003-050/MJ-A6SPF0009-100 to make the connection.

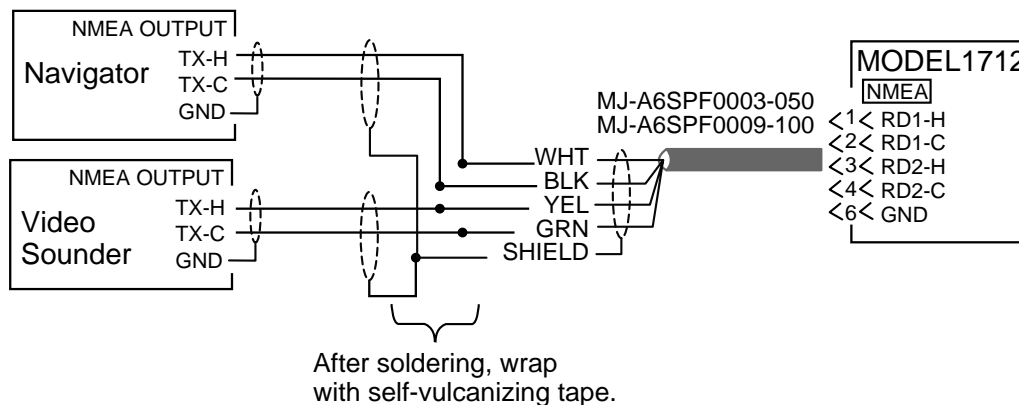


Figure 16 Connection of video sounder and navigator cables using NMEA cable type MJ-A6SPF0003-050/MJ-A6SPF0009-100

External buzzer (option)

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

External buzzer
 Type: OP03-168
 Code No.: 008-462-790

Name	Type	Code no.	Qty
MJ-XH connector	03-2022 (2-3P)	008-463-540	1
Buzzer assy.	80-0641	008-462-800	1

1. Unfasten screws and connector nuts to remove the rear cover from the display unit.
2. Place the rear cover on a workbench, out side up. Remove the plastic hole cover from the location shown in Figure 19 with a Phillips screwdriver and a hammer. Remove burrs from the hole with a fine file or sandpaper.
3. Insert the MJ connector (supplied as option) in the hole made at step 2 as shown in Figure 17. And then fasten the connector nut with 0.76-0.78 N•m torque.
4. Plug in the XH connector at the end of above connector into J6 on the DU Board.
5. Fasten screws and connector nuts to reassemble the display unit. Torque should be between 0.76-0.78 N•m.
6. Fasten the buzzer near the display unit (within 1 m) with two tapping screws (3X15 or 3X20; local supply).
7. Attach the connector from the external buzzer to the MJ connector.

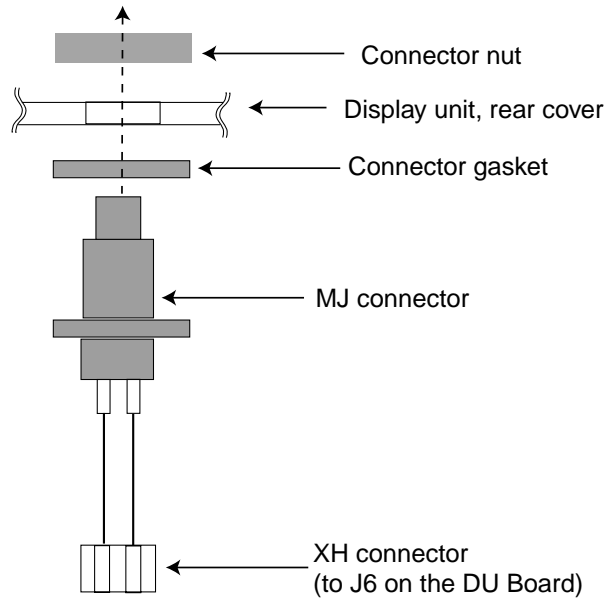


Figure 17 Fixing MJ-XH connector assembly

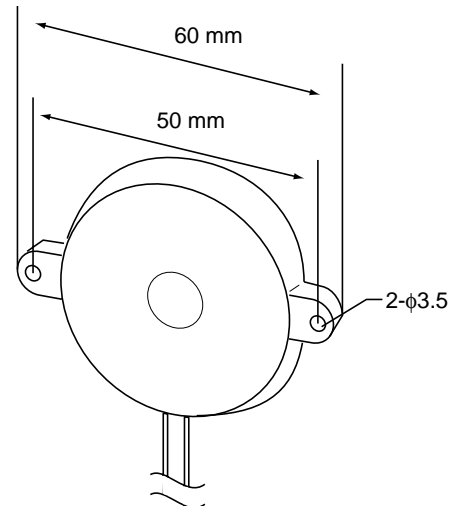


Figure 18 External buzzer

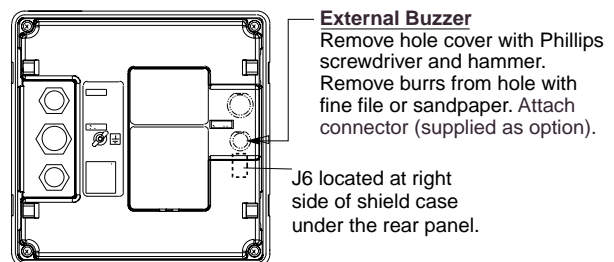


Figure 19 Display unit, rear view

3. ADJUSTMENTS

3.1 Installation Check

After installing the system it is a good idea to check it for proper installation, following the checklist provided below.

- Cable gland is facing toward the stern.
- Four fixing bolts securing the antenna unit are securely tightened.
- The signal cable is waterproofed at the base of the antenna unit.
- The antenna cable is securely retained against the mast or mounting and is free of interference from running rigging.
- The cable gland on the deck or bulkhead is waterproofed, if provided.
- Connectors of external equipment are securely plugged into the radar display unit.
- The power connections to the battery are of correct polarity.

3.2 Exchanging Display Unit of Previous Model

When exchanging the display unit of the MODEL 1712 with that of the MODEL 1622 or 1621/1621 MARK-2, it is necessary to select the appropriate display setting. This should be done with the radar in stand-by.

1. Press % and & together for about 10 seconds to show the display shown in Figure 20.

PROGRAM NO 03591620XX		SEL MENU BY ◀/▶ KEY		
1	MODEL	1712	1622	1621/M2
2	DISPLAY	MAIN	DEMO	
NAV DATA (NMEA 0183)				
GLL		BWR	BWC	GLC GTD
RMA		RMB	RMC	VTG MTW
DBT		DBS	DPT	GGA

Figure 20 Maintenance menu

2. Select MODEL by %.
3. Select 1622 or 1621/M2 by ▶.
4. Press the [MENU] key to close the menu.

3.3 Adjustments

Do the following in order to adjust the radar.

1) Adjustment of picture

1. Press the [POWER] key on the display unit. The display should light. In approximately one minute, ST-BY appears at the screen center.
2. When ST-BY appears press the [TX] key. The radar will start transmitting, and you will probably see some targets, even though the radar is not yet properly adjusted.
3. Adjust the GAIN to display a small amount of noise on the screen.
4. Press the [-] key several times to select the minimum range. Adjust the STC to display nearby radar targets clearly on the screen. Too much STC action will eliminate small targets, and too little STC action will cause the screen to be so full of targets and noise that it is hard to determine which target is which as compared to visual sightings.

2) Heading alignment

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 mark (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, up to ± 30 degrees.

1. Identify a suitable target (for example, ship or buoy) at a range between 0.125 to 0.25 miles, preferably near the heading mark. To minimize error, keep echoes in the outer half of the picture by changing the range.
2. Press and hold down \blacktriangleleft and \blacktriangleright together (about 10 seconds) to display the installation menu.

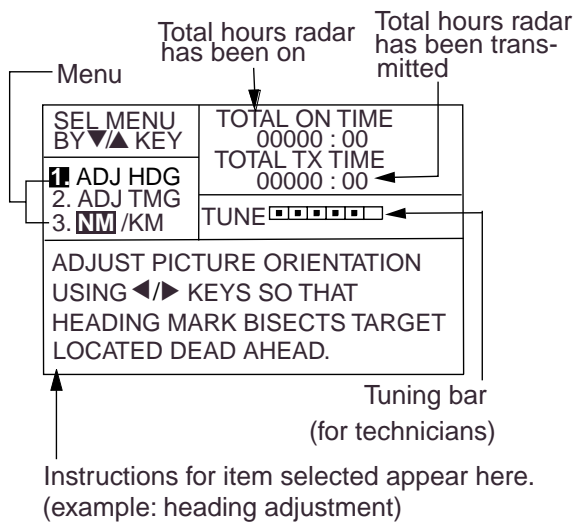


Figure 21 Installation menu

3. Select ADJ HDG. Your display should now look something like the one shown in Figure 22.

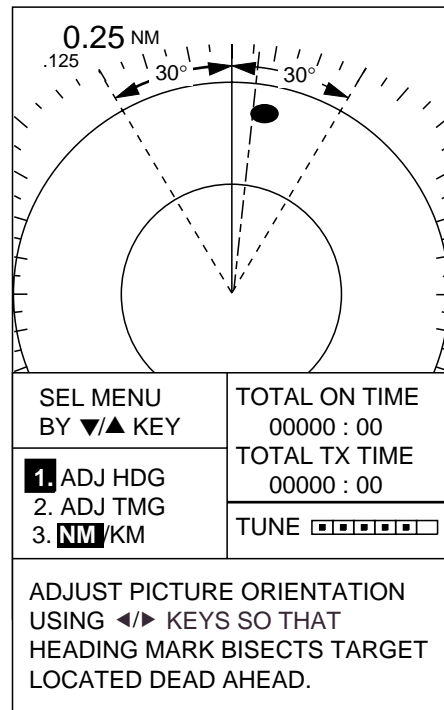


Figure 22 Display for adjustment of heading

4. Press \blacktriangleleft or \blacktriangleright to bisect the target selected at step 1 with the dot-dash-line.
5. Press MENU.

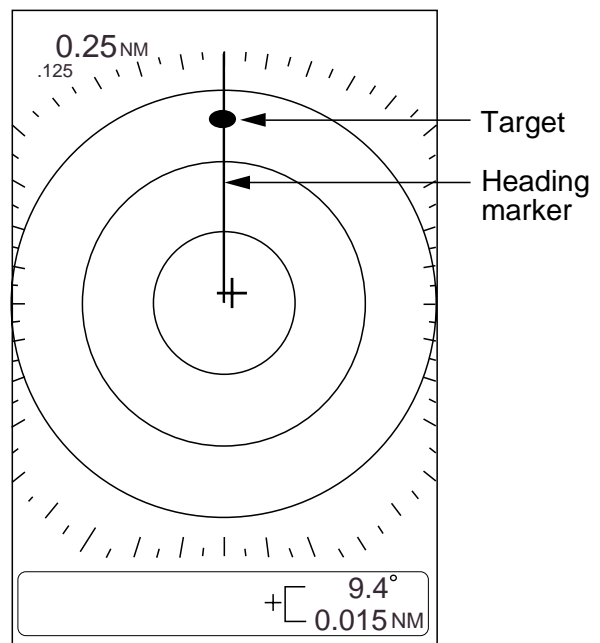


Figure 23 How to adjust heading

6. 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) Sweep timing

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 antenna 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.

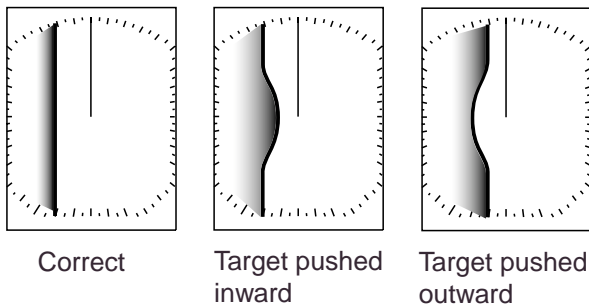


Figure 24 Examples of improper and correct sweep timings

1. Transmit the radar on 0.125 or 0.5 nm range and adjust the sensitivity and STC.
2. Visually select a straight echo (harbor wall, straight pier).
3. Press ◀ and ▶ for 10 seconds to show the installation menu.
4. Select ADJ TMG on the menu.

SEL MENU BY ▼/▲ KEY	TOTAL ON TIME 00000 : 00
1. ADJ HDG	TOTAL TX TIME 00000 : 00
2. ADJ TMG	TUNE [] [] [] [] [] [] [] [] [] []
3. NM/KM	
IDENTIFY STRAIGHT TARGET SUCH AS BREAKWATER. MAKE ITS ECHO STRAIGHT ON SCREEN USING ◀/▶ KEYS.	

Figure 25 Installation menu, ADJ TMG selected

4. While looking at the target selected at step 2, straighten it by pressing ▶ if it is pulled inward, or ◀ if it is pushed outward.

4) Unit of range measurement for VRM and cursor

The unit of range measurement for the VRM and the cursor may be selected to nautical mile or kilometers as follows:

1. Select NM/KM on the menu.

SEL MENU BY ▼/▲ KEY	TOTAL ON TIME 00000 : 00
1. ADJ HDG	TOTAL TX TIME 00000 : 00
2. ADJ TMG	TUNE [] [] [] [] [] [] [] [] [] []
3. NM/KM	
<RANGE UNIT> PRESS ◀/▶ KEYS TO SELECT NAUTICAL MILE OR KILOMETER AS THE UNIT OF RANGE.	


Figure 26 Installation menu, NM/KM selected

2. Select unit of range desired.
3. Press the [MENU] key to close the installation menu.

3.4 Adjustments for Technicians

1) Magnetron heater voltage

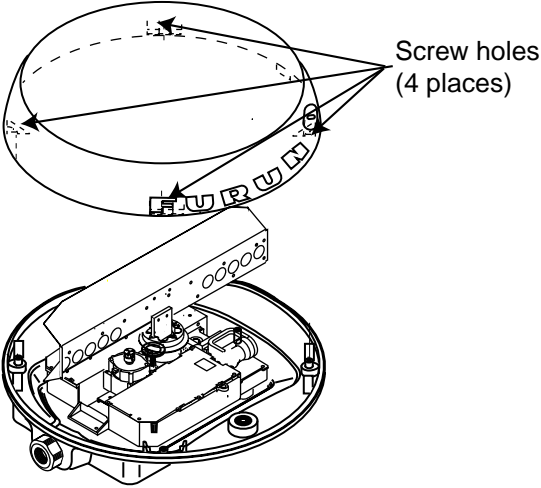
Magnetron heater voltage is formed at the MD Board of the antenna unit and preadjusted at the factory for use with any length of signal cable. Therefore no adjustment is required. However, verify heater voltage as follows:



CAUTION

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.



Note: Turn the power on when measuring magnetron heater voltage.

1. Dismount the shield plate.

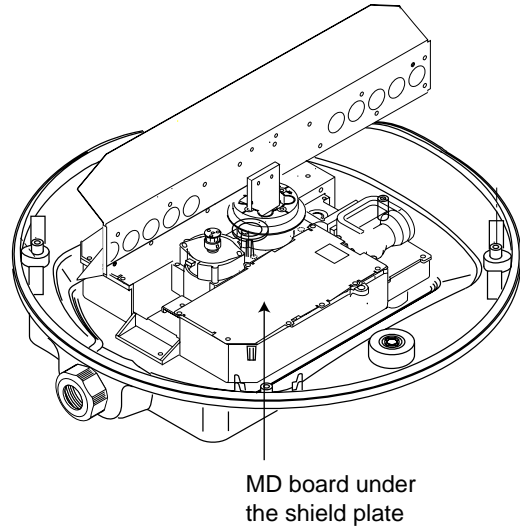


Figure 27 MD board

2. Turn on the power. Do not transmit the radar.
3. Connect a multimeter, set to 10 V DC range, between #6(+) and #4(-) of test point TP804 on the MD Board in the antenna unit.
4. Confirm that the multimeter shows 8.0 V ± 0.1 V. If it does not, adjust potentiometer VR801 on the MD Board.

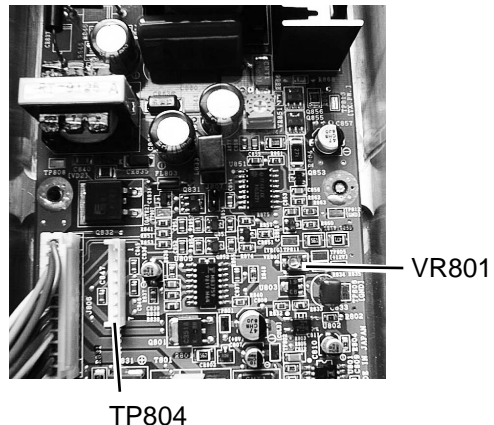


Figure 28 Antenna unit, inside view

2) Radar function

This radar can function as the main radar or a demonstration model, displaying internally generated radar echoes.

1. Set the radar in stand-by.
2. Press and hold down $\%$ and $\&$ together (about 10 seconds) to display the maintenance menu.

PROGRAM NO 03591620XX		SEL MENU BY $\blacktriangleleft/\blacktriangleright$ KEY	
1	MODEL	1712	1622 1621/M2
2	DISPLAY	MAIN	DEMO
NAV DATA (NMEA 0183)			
GLL	BWR	BWC	GLC GTD
RMA	RMB	RMC	VTG MTW
DBT	DBS	DPT	GGA

Figure 29 Maintenance menu

3. Select MAIN or DEMO from the DISPLAY field. (MAIN, Main radar display, DEMO, demonstration display.)
4. Press the [MENU] to close the menu.

3.5 I/O Data Confirmation

You can confirm NMEA input from a navigator or echosounder. Follow the procedure shown in 2) Radar function to display the maintenance menu. NMEA sentences being input are shown in reverse video.

3.6 Restoring Default Settings

All default menu settings can be restored by turning on the power while pressing and holding down [MENU] and \blacktriangledown .

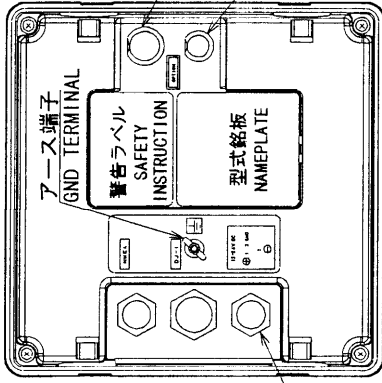
Note: Disconnect the antenna cable to use as demonstration model.

4

3

2

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

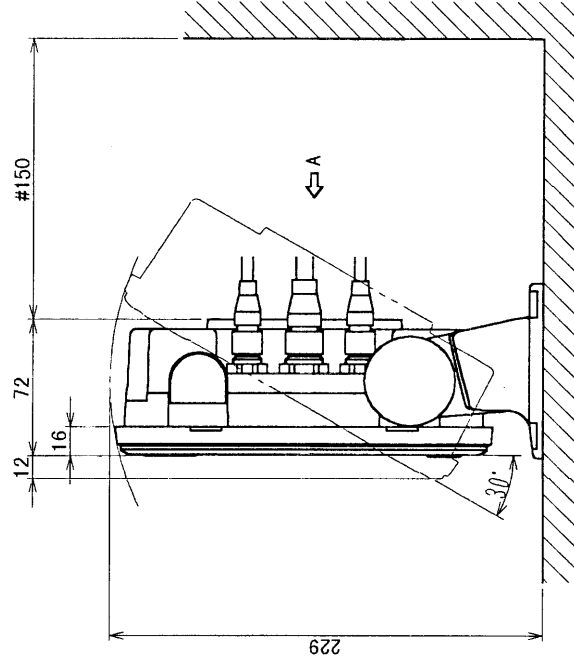
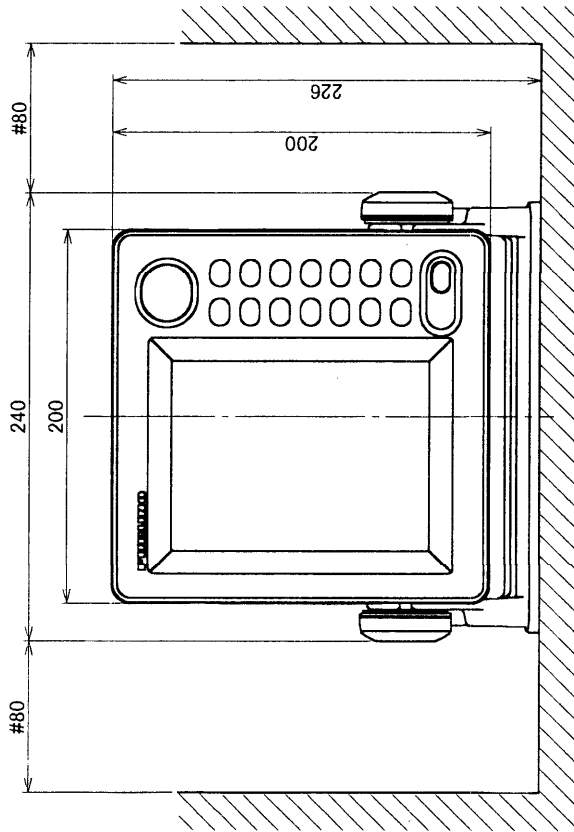
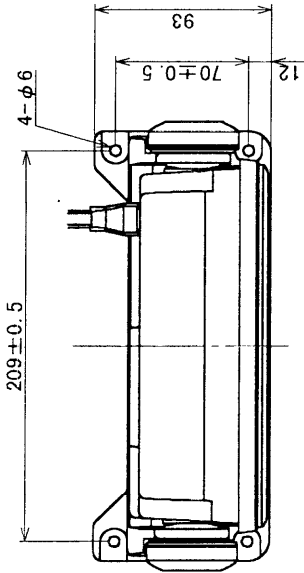


オプション (副指示器出力) 用 表 1
OPTION (FOR SLAVE DISPLAY) TABLE 1

オプション (外付けブザー) 用
OPTION (FOR EXT. BUZZER)

電源
SOURCE

矢視 A VIEW A



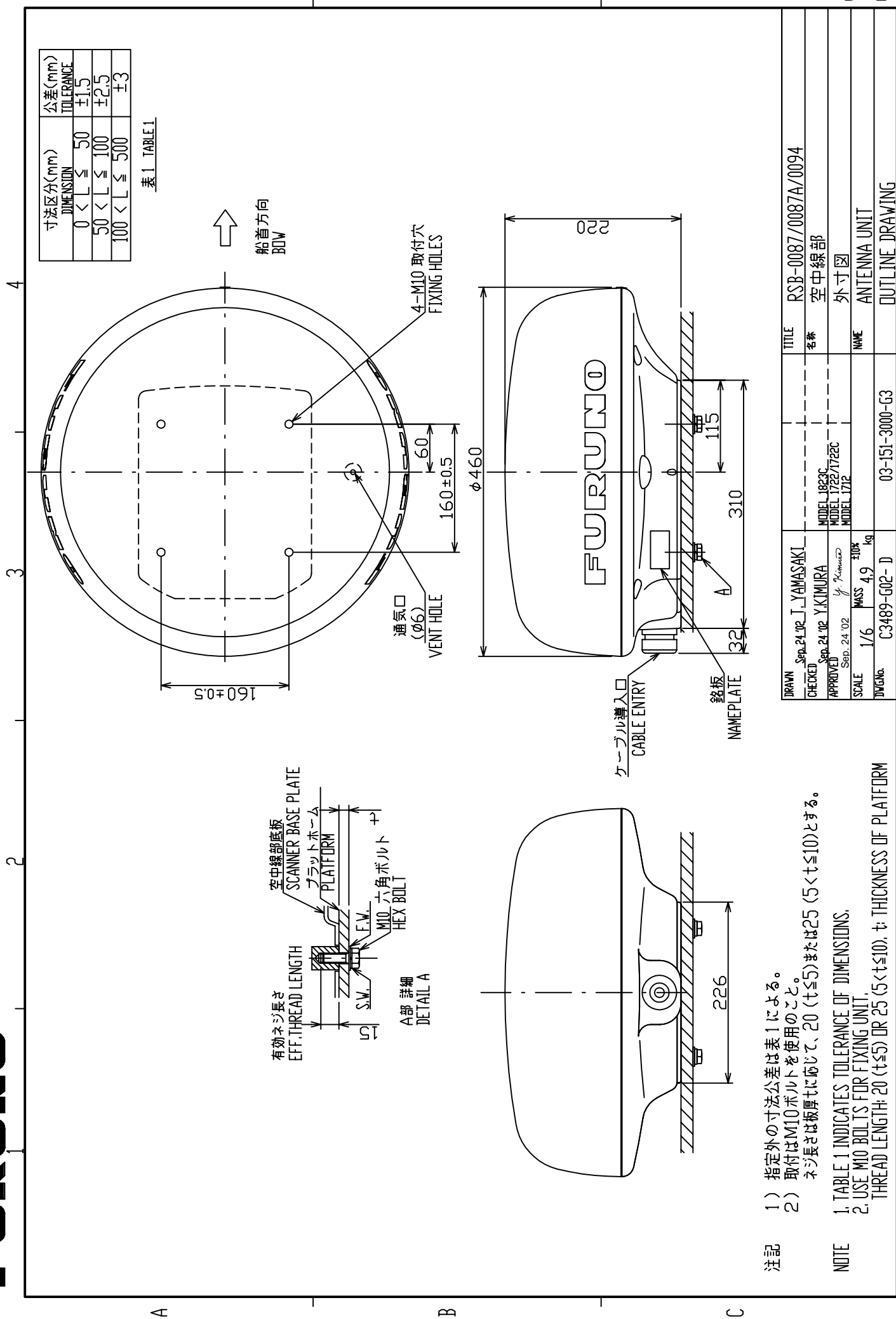
- 注記
- 1) #印寸法は最小サービス空間寸法とする。
 - 2) 指定外の寸法公差は表1による。
 - 3) 取付用ネジは+トラスタップピンネジ呼び径5x20を使用のこと。
 - 4) 装備ケーブルはサービス時、本体を前方に十分引出せるよう余裕を持たせること。
- NOTE
1. #: RECOMMENDED SERVICE CLEARANCE.
 2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
 3. USE TAPPING SCREWS 5x20 FOR FIXING UNIT.
 4. KEEP ENOUGH CABLE LENGTH BEHIND UNIT.

DRAWN APR 7 00 T.YAMABE	TITLE RDP-134
CHECKED APR 11 00 J. K...	名称 指示部 (卓上装備)
APPROVED APR 11 00 S. S...	外寸図
SCALE 1/4	NAME DISPLAY UNIT (DESKTOP MOUNT)
MASS ±10% 1.6 kg	OUTLINE DRAWING
DWG. No. C3489-601-A	03-152-1000-G2

A

B

C



注記

- 指定外の寸法公差は表1による。
- 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。

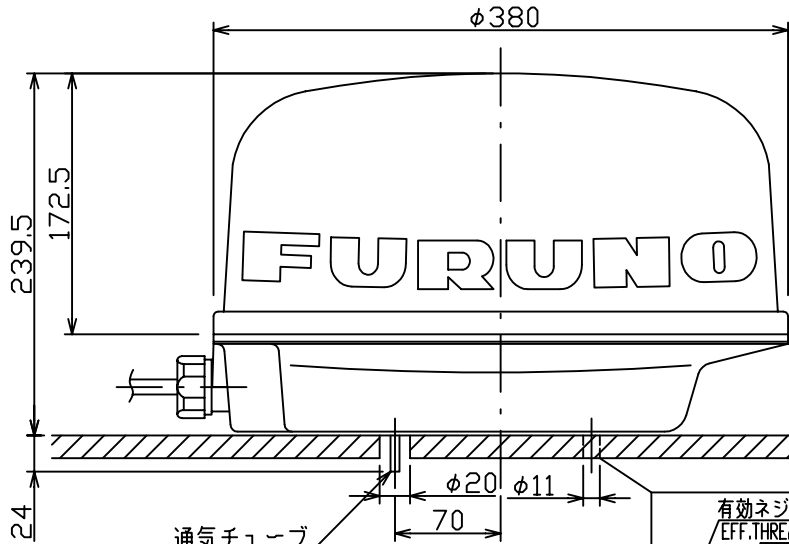
NOTE

- TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
- USE M10 BOLTS FOR FIXING UNIT.
THREAD LENGTH: 20 (t ≤ 5) OR 25 (5 < t ≤ 10), t: THICKNESS OF PLATFORM

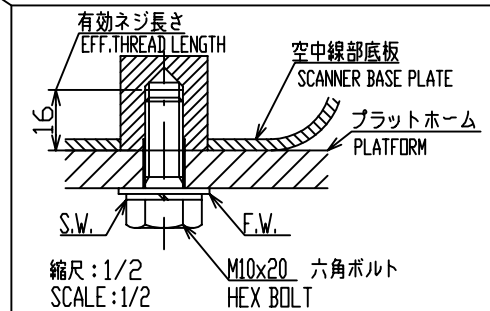
表1 TABLE 1

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

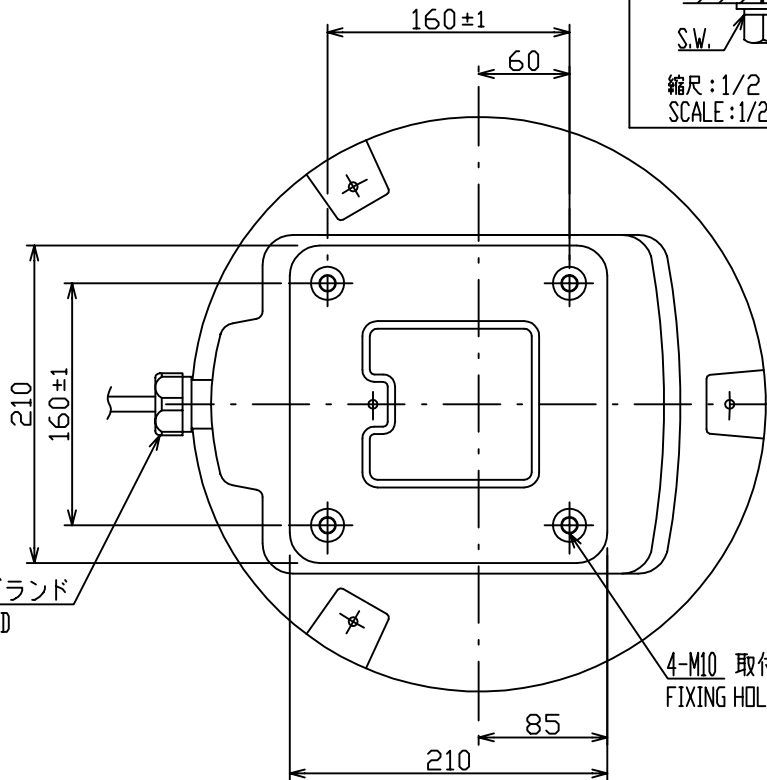
A



通気チューブ
VENT TUBE



B



ケーブルグランド
CABLE GLAND

4-M10 取付穴
FIXING HOLES

船首方向
SHIP'S BOW

表3 TABLE 3

型式 TYPE	空中線型式 ANT. TYPE	質量 (kg) MASS(±10%)
MODEL 1621/M2	RSB-0060	5.2
MODEL 1622	RSB-0060	4.5
MODEL 1623	RSB-0093	4.6

表2 TABLE 2

	M1621	M1621 M2	M1622/1623
スタンダード STANDARD	1.7 m	2.0 m	1.25 m
ステアリング STEERING	1.3 m	1.5 m	0.95 m

注記

- 1) 指定なき寸法公差は表1による。
- 2) 通気チューブ及びケーブルグランドは出荷時に取付済。
- 3) コンパス安全距離を表2に示す。

NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
2. VENT TUBE AND CABLE GLAND ARE FITTED AT FACTORY.
3. TABLE 2 INDICATES COMPASS SAFE DISTANCES.

D

DRAWN Oct. 10 '02 J.YAMASAKI	TITLE RSB-0060/0093
CHECKED Oct. 10 '02 Y.KIMURA	名称 空中線部
APPROVED Oct. 10, '02 Y. Kimura	MODEL 1621/1621M2 MODEL 1622/1623
SCALE 1/5	NAME SCANNER UNIT
DWG.No. C3378-G02-J	03-118-3000-0 OUTLINE DRAWING

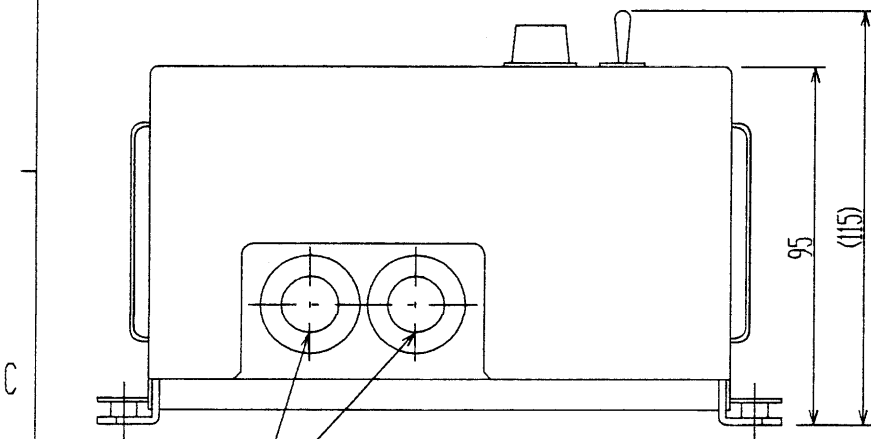
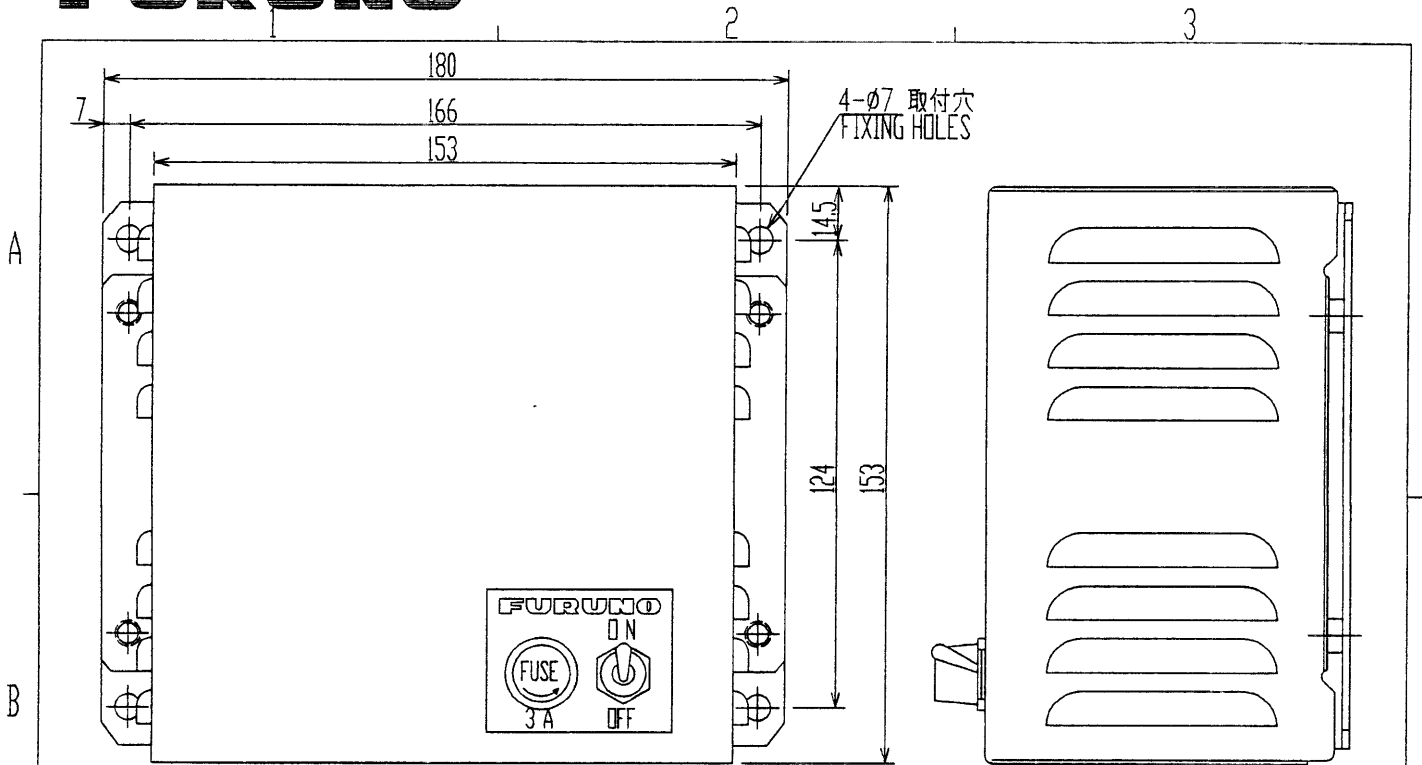


表1 TABLE 1

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

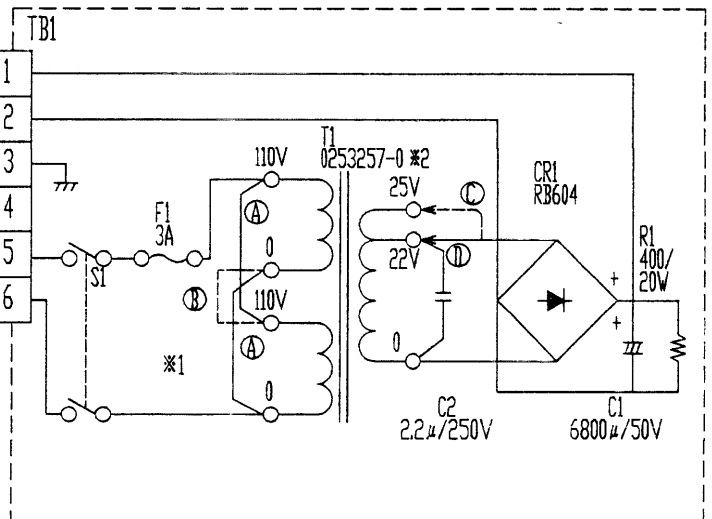
ケーブル導入口
CABLE ENTRY

24VDC
OUTPUT
(2.5A max)

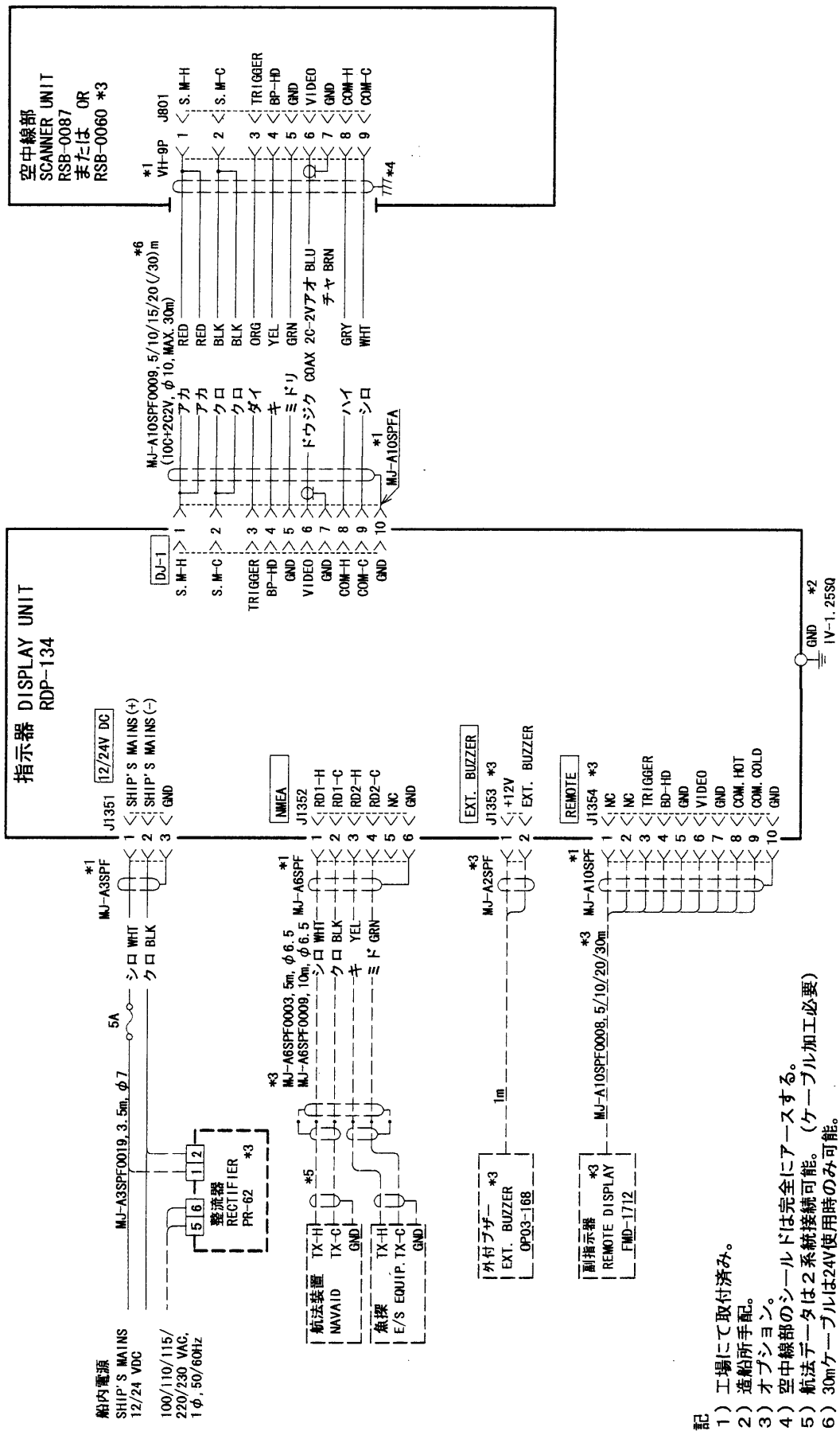
AC INPUT

入力電圧に応じて接続を変更して下さい。
CHANGE TAP CONNECTIONS DEPENDING ON SUPPLY VOLTAGE.

	AC100V	AC110/ 115V	AC220V	AC230V
*1	(A)	(A)	(B)	(B)
*2	(C)	(D)	(D)	(D)



DRAWN Sep. 14 '01 T. YAMASAKI	TITLE PR-62
CHECKED Y. K. I.	名称 整流器
APPROVED Y. K. I.	外寸図
SCALE 1/2 MASS ±10% 3 kg	NAME RECTIFIER
DWG.No. C5003-034-E	OUTLINE DRAWING



- 注記**
- *1) 工場にて取付済み。
 - *2) 造船所手配。
 - *3) オプション。
 - *4) 空中線部のシールドは完全にアースする。
 - *5) 航法データは2系統接続可能。(ケーブル加工必要)
 - *6) 30mケーブルは24V使用時のみ可能。

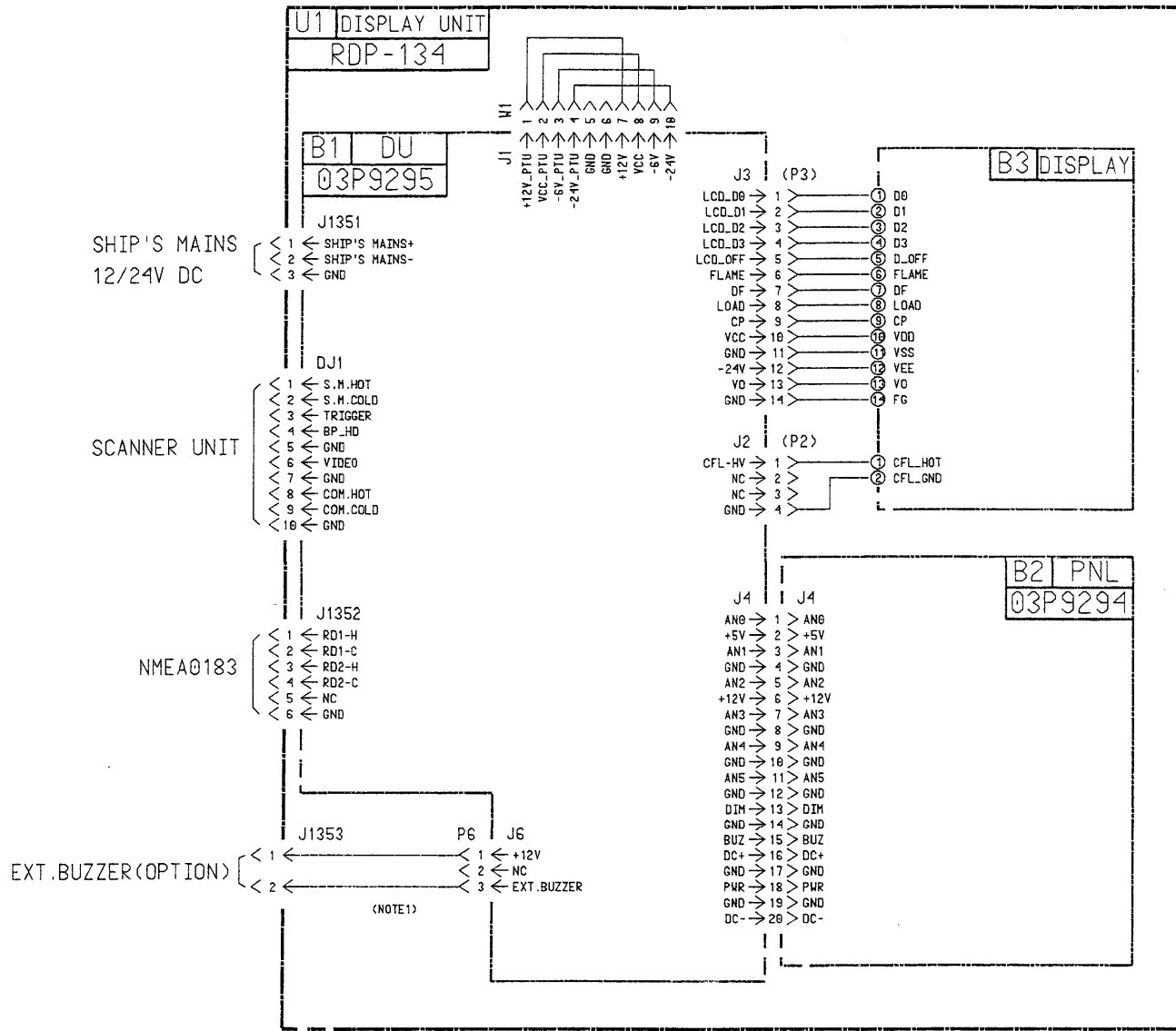
DRAWN Jun. 11 '01 T. YAMASAKI		TITLE	MODEL 1712
CHECKED June 11 '01 Y. Kuri		名称	船舶用レーダー
APPROVED June 20 '01 S. Mizushima		相互結線図	
SCALE MASS kg		NAME	MARINE RADAR
DWG. No. C3489-C01-F		INTERCONNECTION DIAGRAM	
			03-152-6001-3

A

B

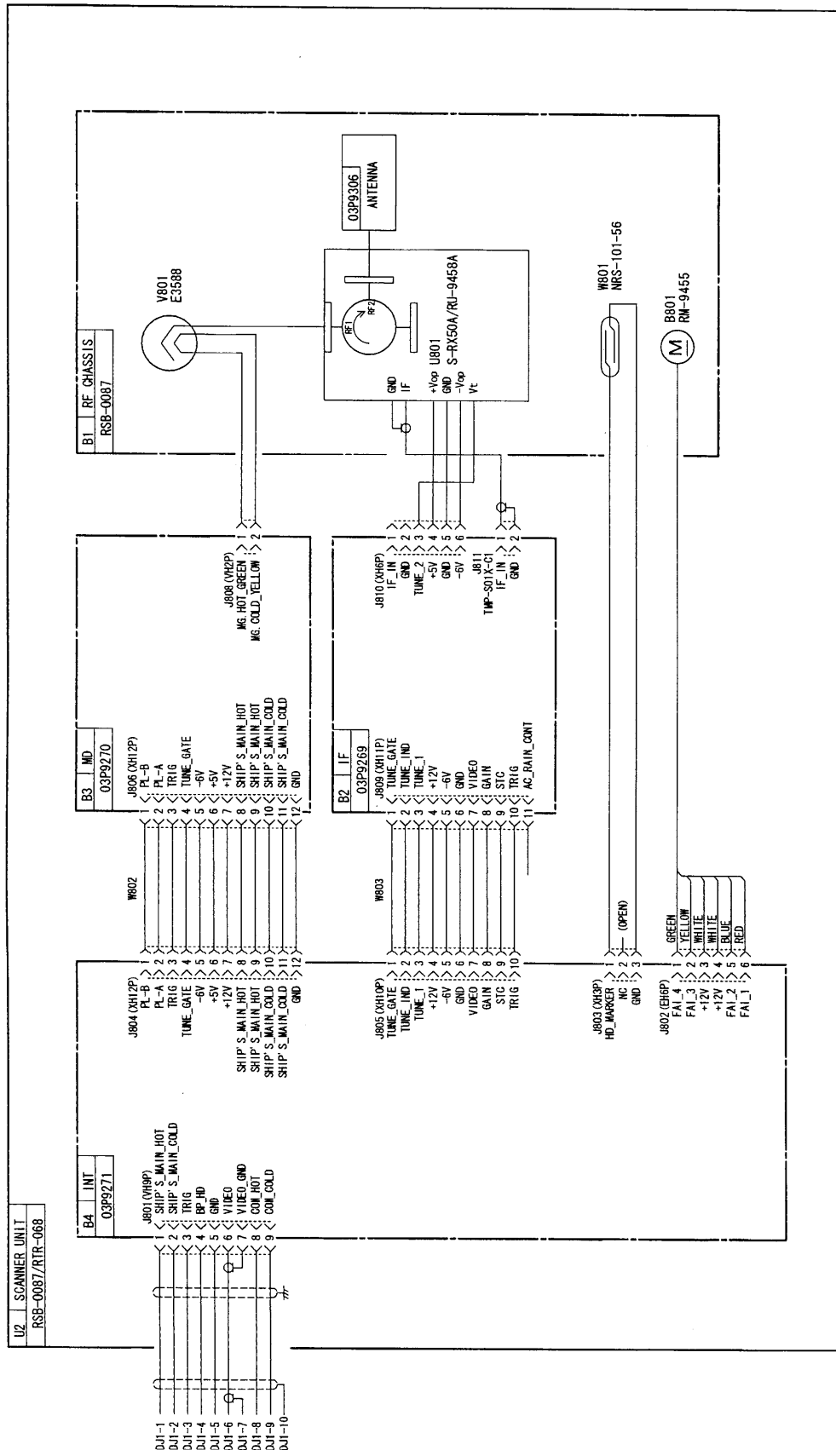
C

D



(NOTE1) CONNECTOR ASSY SUPPLIED WITH OP03-168.

DRAWN <i>Apr 5 '00 T. YAMASAKI</i> CHECKED <i>Apr 5 '00 Y. K...</i> APPROVED <i>Apr 5 '00 S. ...</i>			TYPE RDP-134 名称 指示部
SCALE / MASS kg	MODEL 1712	APPLICABLE TO; (MODEL)	BLOCK NO. NAME DISPLAY UNIT
DWG NO. C3489-K01-A	03-152-6003-1	SCHEMATIC DIAGRAM	



A

B

C

DRAWN Sd 4.02	T. YAMASAKI	TITLE	RSB-0087-068
CHECKED K.K.	K.K.	名称	空中線部 (総合)
APPROVED K.K.	K.K.	回路図	
SCALE 1/1	1/1	MODEL	1712
	kg	NAME	SCANNER UNIT (GENERAL)
DWG No.	C3489-K07-A		SCHEMATIC DIAGRAM
	03-146-6003-7		