INSTALLATION MANUAL
COLOR DGPS/PLOTTER GP-1850D
COLOR GPS PLOTTER GP-1850

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SAFETY INSTRUCTIONS

Safety Instructions for the Installer

⚠ WARNING

Do not work inside the equipment unless totally familiar with electrical circuits.

Hazardous voltage which can shock, burn or cause serious injury exists inside the equipment.

Turn off the power at the mains switchboard before beginning the installation. Post a sign near the switch to indicate it should not be turned on while the equipment is being installed.

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.

Confirm that the power supply voltage is compatible with the voltage rating of the equipment.

Connection to the wrong power supply can cause fire or equipment damage. The voltage rating appears on the label at the rear of the display unit.

Use the correct fuse.

Use of a wrong fuse can cause fire or equipment damage.

Keep the following compass safe distance.

	Standard	Steering
Display Unit	0.98 m	0.74 m

Equipment Lists

Standard supply

NO.	Name	Type	Code No.	Qty	Remarks
1	Display unit	GP-1850	-	1	for GP-1850
		GP-1850D	-		for GP-1850D
2	Antenna Unit	GPA-017	-	1	for GP-1850
		GPA-018	-		for GP-1850D
		GPA-019	-		for GP-1850D
3	Spare parts	SP14-02501	004-375-260	1	Fuse
4	Installation materials	CP14-05200	000-041-496	1	Power cable, cable assy.
5	Accessories	FP14-02401	004-375-270	1	Hard cover
		FP14-02403	004-376-180	1	Screws, rubber cushion

Optional equipment

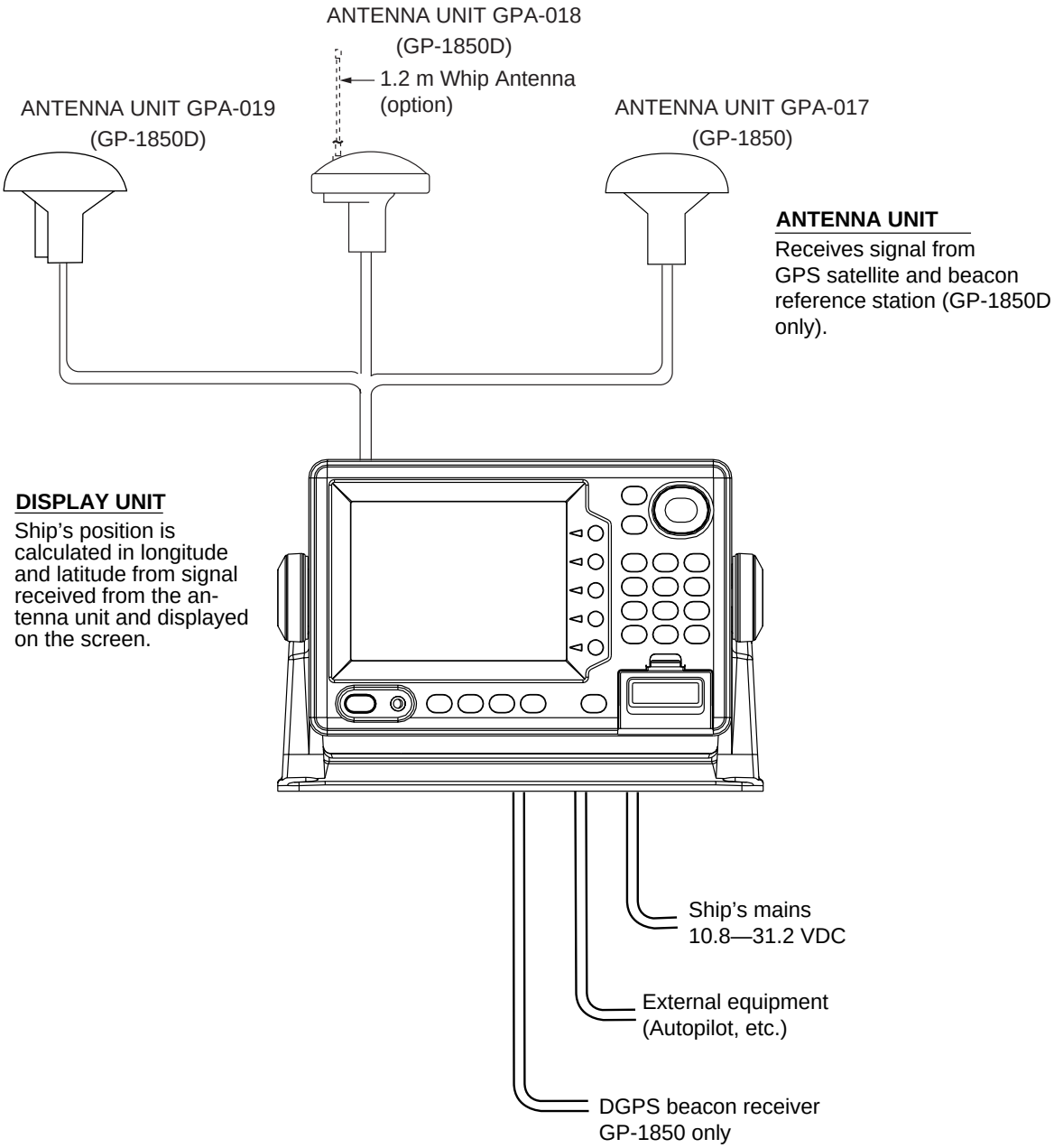
NO.	Name	Type	Code No.	Remarks
1	Beacon receiver kit	GR-802-1650-10A-018	000-041-651	GPA-018, GR-7000A, whip ant.
		GR-802-1650-10N-018	000-041-482	GPA-018, GR-7000A, no whip ant.
		GR-902-1650-15A-018S	000-041-652	GPA-018S, GR-7000A, whip ant.
		GR-802-1650-15N-018S	000-041-483	GPA-018S, GR-7000A, no whip ant.
		GR-802-1650-10N-019	000-041-650	GPA-019, GR-7000A
		GR-902-1650-15N-019S	000-041-653	GPA-019S, GR-7000A
2	Antenna cable assy.	TNC-PS-3D-15	000-133-670	15m, for antenna cable extension
3	Antenna cable set	CP20-01700	004-372-110	30m, for antenna cable extension
		CP20-01710	004-372-120	50m, for antenna cable extension
4	Cable Assy.	MJ-A7SPF0003-050	000-136-730-01	
5	Mast mount fixture	CP20-0111	004-365-780	
6	Right-angle antenna base	No.13-QA330	000-803-239	for mounting antenna unit
7	L-angle antenna base	No.13-QA310	000-803-240	
8	Antenna base for rail mounting	No.13-RC5160	000-806-114	

Optional equipment (con't)

NO.	Name	Type	Code No.	Remarks
9	Antenna Unit	GPA-018S	000-041-462	for GP-1850D
		GPA-016	000-041-536	for GP-1850
		GPA-019S	000-041-554	for GP-1850D
10	Rectifier	PR-62	000-013-484	for 100VAC
			000-013-485	for 110VAC
			000-013-486	for 220VAC
			000-013-487	for 230 VAC
11	Cable Assy.	MJ-A6SPF0011-050	000-132-244	for connection radar, 6P-4P, 5m
		MJ-A6SPF0011-100	000-132-336	for connection radar, 6P-4P, 10m
		MJ-A6SPF0012-050	000-134-424	for navaid or E/S, 6P-6P, 5m
		MJ-A6SPF0012-100	000-133-817	for navaid or E/S, 6P-6P, 10m
12	Whip antenna	FAW-1.2	000-136-046	for GP-1850D
13	Remote controller	RMC-185-E	004-375-300	Cotroller, vinyl cover, battery
14	RAM Card	00RAM02MC-004	004-371-790	2MB
15	DGPS Beacon Receiver	GR-80	-	for GP-1850

System Configuration

The GP-1850/1850D mainly consists of a display unit and a GPS antenna. A DGPS beacon receiver is provided inside the display unit for GP-1850D type. The mini chart card drive in the display unit loads electronic charts. External equipment which may be connected include an autopilot and a DGPS beacon receiver (GP-1850).



1. Installation of Standard Equipment

1.1 Installation of Display Unit

Mounting considerations

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

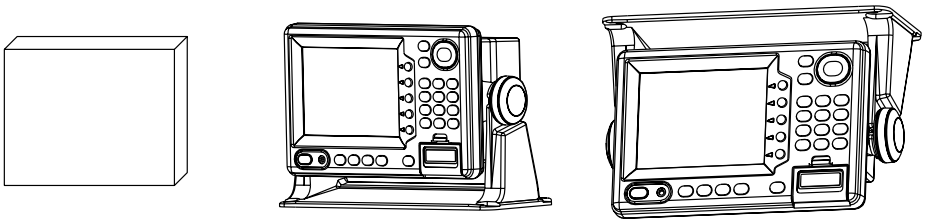


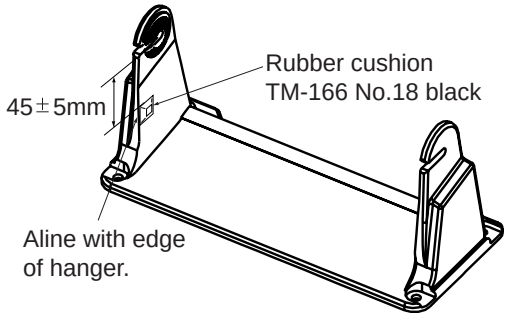
Figure 1-1 Tabletop, overhead mounting methods

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 placed too close to the display unit. Observe the following compass safe distances to prevent disturbance to the magnetic compass:

  Standard compass: 0.98 meters
  Steering compass: 0.74 meters

- Rubber Cushions which absorb vibration (supplied) maybe attached as below if vibration is a problem.



Mounting procedure

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

Tabletop, overhead mounting

1. Fix the hanger by four tapping screws M5 X 16.
2. Screw knob bolts in display unit, set it to hanger, and tighten knob bolts.
3. Attach hard cover to protect LCD.

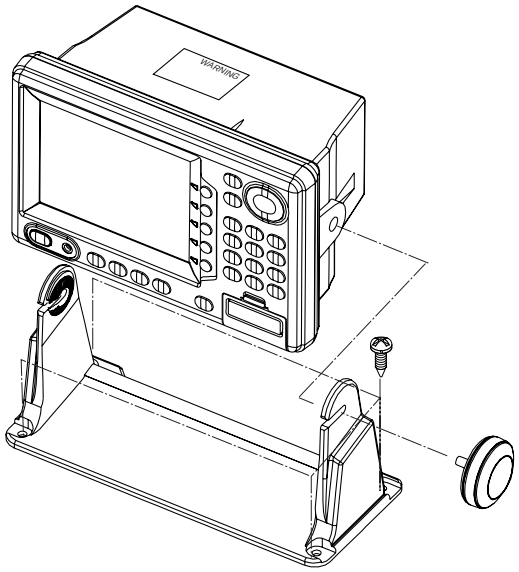
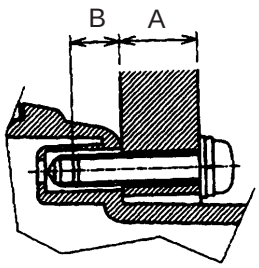


Figure 1-2 Tabletop, overhead mounting of display unit

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 plus 7.3±1.5 mm. Also the length of B below should max. 7 mm.



1. Prepare a cutout in the mounting location whose dimensions are as shown in Figure 1-3.
2. Fix the display unit by six pan head screws M4 X 20. Refer to the outline drawing on page D-2.

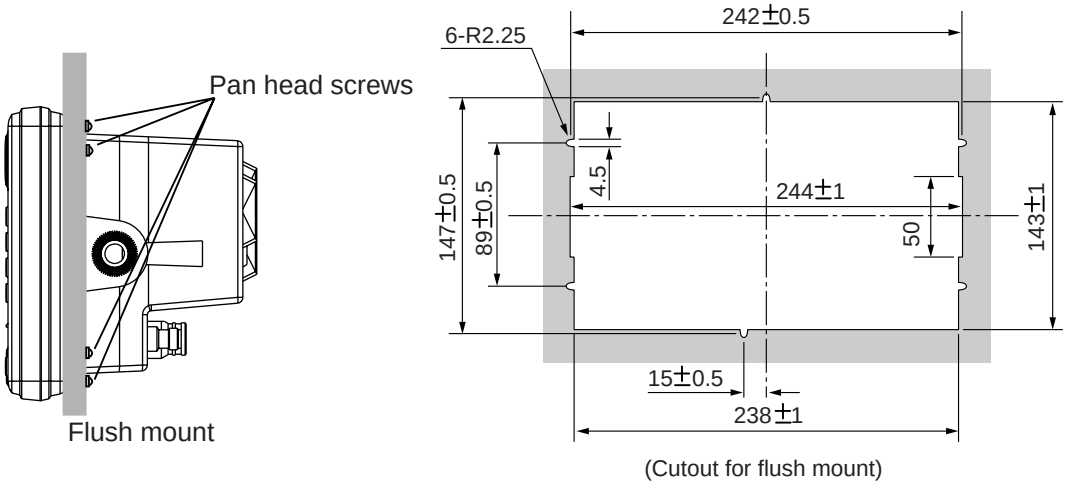


Figure 1-3 Flush mounting of display unit

1.2 Installation of Antenna Unit

Mounting considerations

Install the antenna unit referring to the installation diagram on page D-3 or D-4. When selecting a mounting location for the antenna unit, keep in mind the following points:

- Select a location out of the radar beam. The radar beam will obstruct or prevent reception of the GPS satellite signal.
- The location should be well away from a VHF antenna. A GPS receiver is interfered by a harmonic wave of a VHF antenna.
- There should be no interfering object within the line-of-sight to the satellites. Objects within line-of-sight to a satellite, for example, a mast, may block reception or prolong acquisition time.
- Mount the antenna unit as high as possible. Mounting the antenna unit as high as possible keeps it free of interfering objects and water spray, which can interrupt reception of GPS satellite signal if the water freezes.
- The length of the whip antenna for the GP-1850D should be no longer than 1.2 meter to prevent antenna damage. **Do not use a 2.5 meter whip antenna.**
- If the antenna cable is to be passed through a hole which is not large enough to pass the connector, you may unfasten the connector with a needle nose pliers and 3/8-inch open-end wrench. Refasten it as shown in Figure 1-4 after running the cable through the hole.

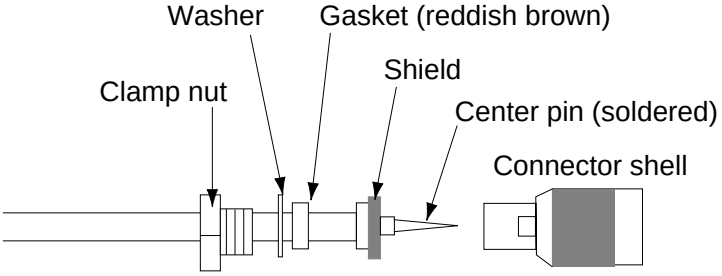


Figure 1-4 How to assemble the connector

2. Wiring

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

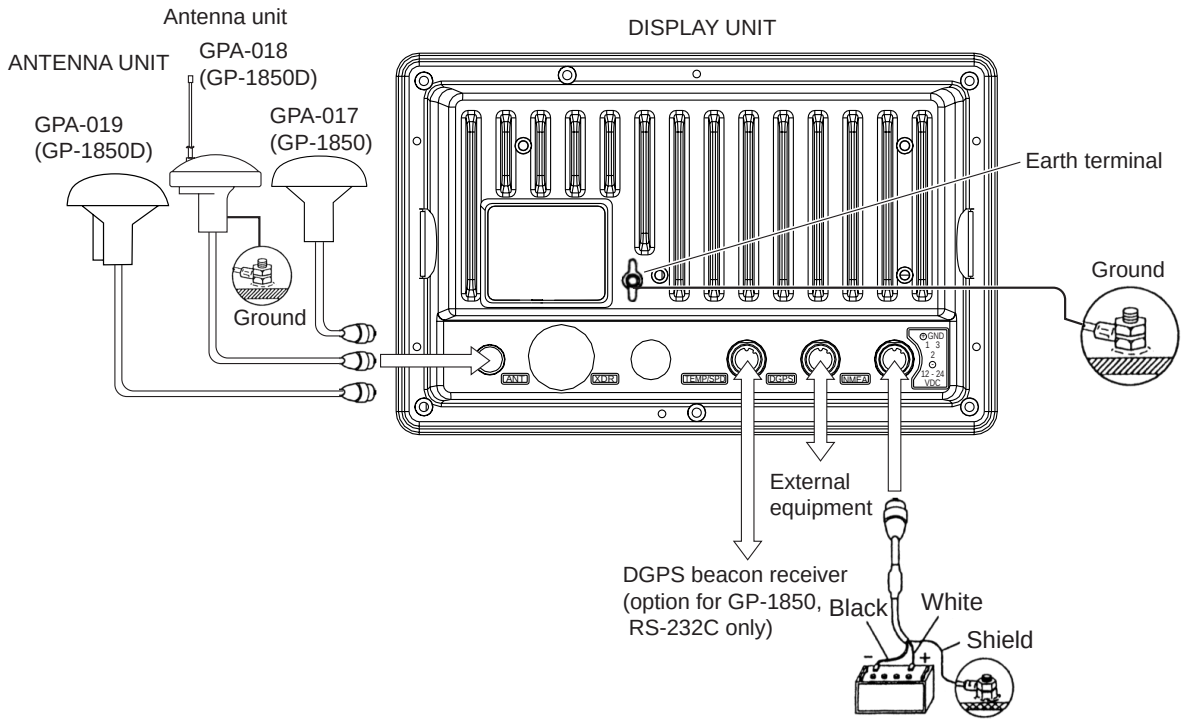


Figure 2-1 Display unit, rear view

Power cable

Connect the power cable to the power connector. Connect the leads to the battery (12 or 24 VDC); white to plus(+) terminal and black to minus(-) terminal.

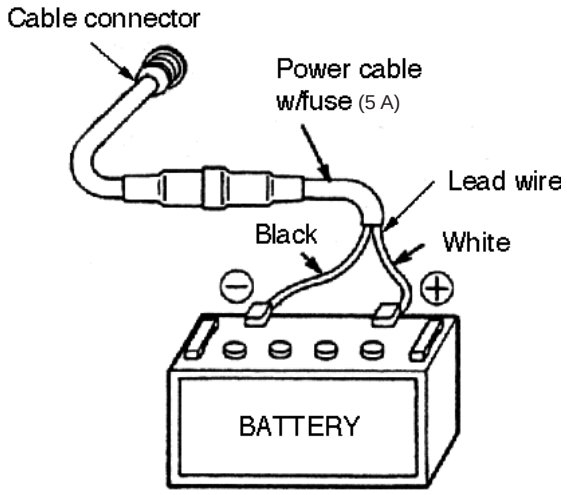


Figure 2-2 Connecting the power cable to the battery

Antenna unit

Connect the antenna cable to the ANT connector.

Ground

The display unit contains several CPUs. While they are operating, they radiate noise, which can interfere with radio equipment. Ground the unit to prevent interference. The grounding wire should be 1.25 sq or larger and as short as possible. Connect the grounding wire to ship's ground. On a fiberglass boat, it is best to install a ground plate that measures about 20 cm by 30 cm on the outside of the hull bottom to provide a ground point. If this is not practical, the engine block can be used.

⚠ CAUTION

Ground the equipment to prevent electrical shock and mutual interference.

Also, the antenna unit GPA-018S type antenna units should be grounded.

Note: Use a “closed” lug to make the ground connection at the display unit. Do not use an “open-type” lug (⊂⊏⊂).

Extending antenna cable length

The standard cable is 10m long. For extension, in case of the GPA-016, GPA-018S, GPA-019S an antenna cable set of 15m, 30m or 50m is available. Extension cable cannot be used with the GPA-017 or GPA-018.

◆ Extension cable line-up (in case of 30 m or 50 m)

Fabricate the end of the antenna cable and attach the coaxial connector. Details are shown on next page.

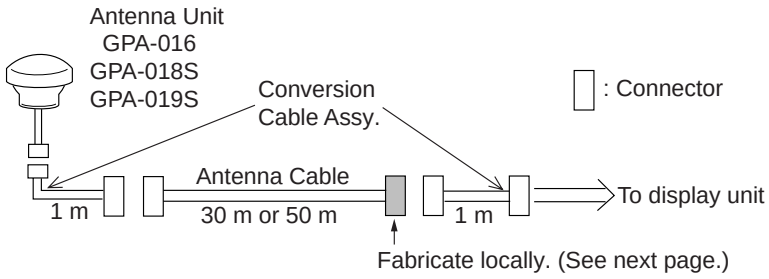


Figure 2-3 Cable extension

◆ Waterproofing connector

Wrap connector with vulcanizing tape and then vinyl tape. Bind the tape end with cable-tie.

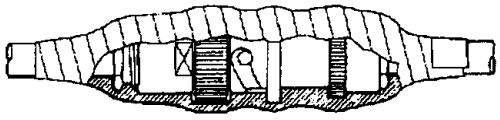
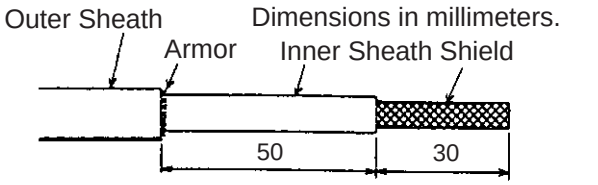
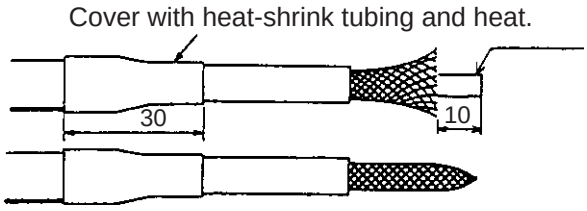


Figure 2-4 Waterproofing connector

How to attach the N-P-8DFB connector

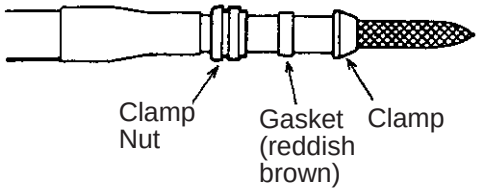


Remove outer sheath and armor by the dimensions shown left.
Expose inner sheath and shield by the dimensions shown left.

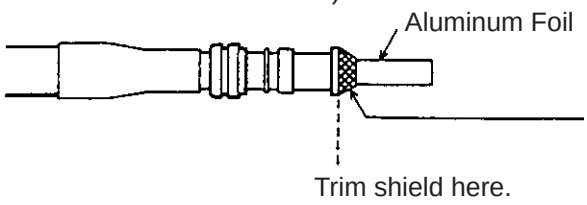


Cut off insulator and core by 10mm.

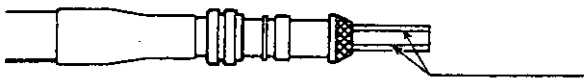
Twist shield end.



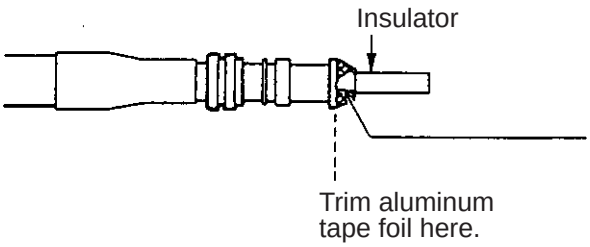
Ship on clamp nut, gasket and clamp as shown left.



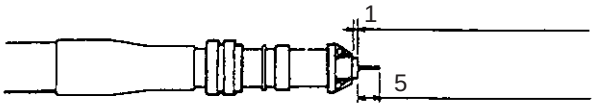
Fold back shield over clamp and trim.



Cut aluminum foil at four places, 90° from one another.

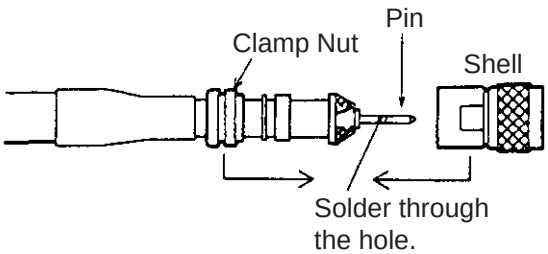


Fold back aluminum foil onto shield and trim.



Expose the insulator by 1mm.

Expose the core by 5mm.



Slip the pin onto the conductor. Solder them together through the hole on the pin.

Insert the pin into the shell. Screw the clamp nut into the shell.
(Tighten by turning the clamp nut. Do not tighten by turning the shell.)

Figure 2-5 Fabrication of coaxial cable

3. Initial Settings

3.1 NMEA Setting

NMEA port

1. Press the [MENU] key.
2. Press the software key labeled "CONFIGURATION".
3. Press the software key labeled "SETUP NMEA PORT1".
4. Select "FORMAT" by the arrow key.
5. Press the software key labeled "EDIT" to display the following message.

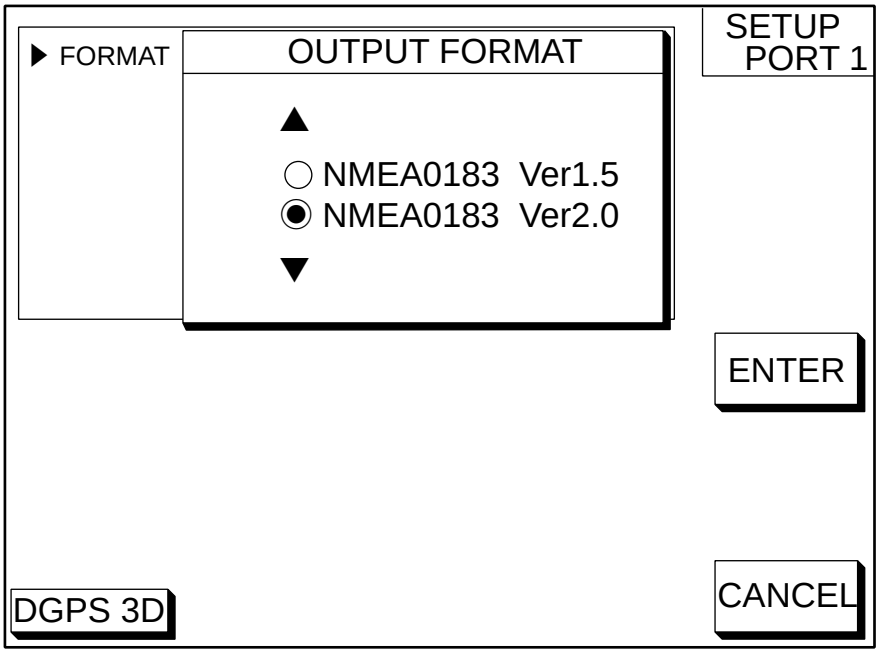


Figure 3-1 Output Format display, NMEA port

6. Select NMEA version desired by the arrow key.
7. Press the software key labeled "ENTER".
8. Press the [PLOT] key to finish.

DGPS port

1. Press the [MENU] key.
2. Press the software key labeled "CONFIGURATION".
3. Press the software key labeled "SETUP NMEA/DGPS PORT 2".
4. Select "FORMAT" by the arrow key.
5. Press the software key labeled "EDIT" to display the following message.

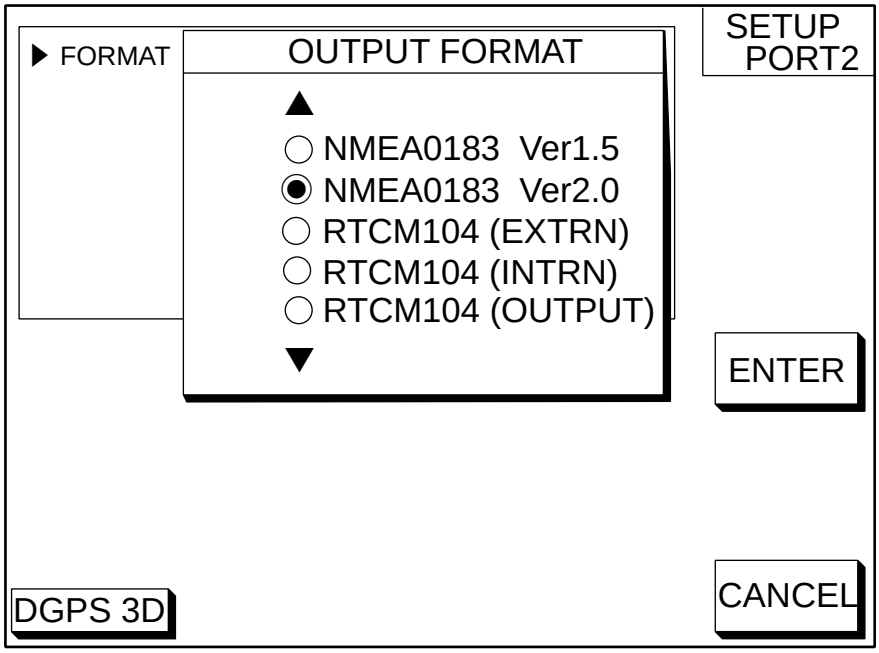


Figure 3-2 Output Format Display, DGPS port

6. Select NMEA version, external DGPS or internal DGPS by the arrow key.

NMEA0183 Ver1.5/Ver2.0	: Select one when connecting PC or RS-232C equipment.
RPCM104(EXTRN)	: Select this when connecting external DGPS beacon receiver.
RTCM104(INTRN)	: Select this for builtin internal DGPS beacon receiver.
RTCM104(OUTPUT)	: Select this when outputtig differential data of the internal DGPS beacon receiver to other GPS navigator.

Note 1)You cannot setup sentences when you select RTCM104 as the format.

Note 2) For RS-422 format, the level converter (IF-1432) is required for connection of external equipment.

7. Press the software key labeled "ENTER".
8. Press the [PLOT] key to finish.

3.2 Output Data Sentences

Select output data sentences for external equipment as follows:.

1. Press the [MENU] key.
2. Press the software key labeled "CONFIGURATION".
3. Press the software key labeled "SETUP NMEA PORT 1".
4. Press the software key labeled "SELECT SNTNC." to display the following list.

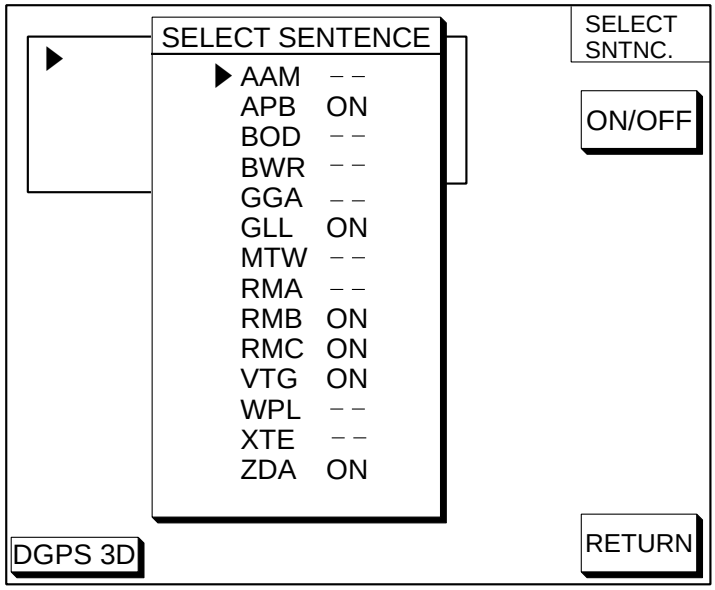


Figure 3-3 Output Data Sentences Display

5. Select data sentence you want to output by the arrow key.
6. Press the software key labeled "ON/OFF". To output data, set to "ON".
7. Repeat to select other sentences.
8. Press the software key labeled "RETURN".
9. Press the [PLOT] key to finish.

Input/Output data sentences

Port	I/O	Format	Data	Remarks
1	Input	• NMEA-0183 Ver. 2.0 Ver. 1.5 • IEC1162	TLL*1, DWM, WPL*1, DBT/DPT	WPL : GP talker only NMEA Ver 1.5: DBT NMEA Ver 2.0: DPT
	Output		AAM, APB, BOD, BWC/BWR, GGA, GLL, RMA, RMB, RMC, VTG, WPL, XTE, ZDA, MTW, GTD*2	GREAT CIRCLE: BWC RHUMB LINE: BWR
2	Input	• NMEA-0183 Ver. 2.0 Ver. 1.5 • RS232C • RTCM104	TLL*1, DWM, WPL*1, DBT/DPT	WPL: GP talker only NMEA Ver 1.5: DBT NMEA Ver 2.0: DPT
	Output		AAM, APB, BOD, BWC/BWR, GGA, GLL, RMA, RMB, RMC, VTG, WPL, XTE, ZDA, MTW, GTD*2	GREAT CIRCLE: BWC RHUMB LINE: BWR

*1: Cannot be input consecutively.
*2: Output automatically when LC or LA is selected.

3.3 Antenna Height

1. Press the [MENU] key.
2. Press the software key labeled "GPS/DGPS/TD OPTIONS".
3. Press the software key labeled "GPS SETUP OPTIONS".
4. Select "ANT. HEIGHT" by the arrow key.
5. Press the software key labeled "EDIT".

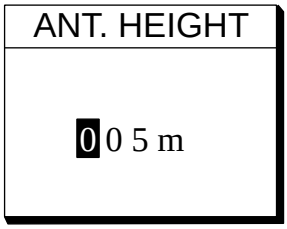


Figure 3-4 Antenna Height Display

6. Enter the height (3 digits) of the antenna above sea level using the numeric keys.
   If you enter wrong antenna height, press the software key labeled "CLEAR".
7. Press the [ENTER] key.
8. Press the [PLOT] key to finish.

3.4 Baud Rate Setting (GP-1850D only)

This setting may not be done when selecting AUTO MODE.

1. Press the [MENU] key.
2. Press the software key labeled "GPS/DGPS/TD OPTIONS".
3. Press the software key labeled "DGPS SETUP OPTIONS" to display the following message.

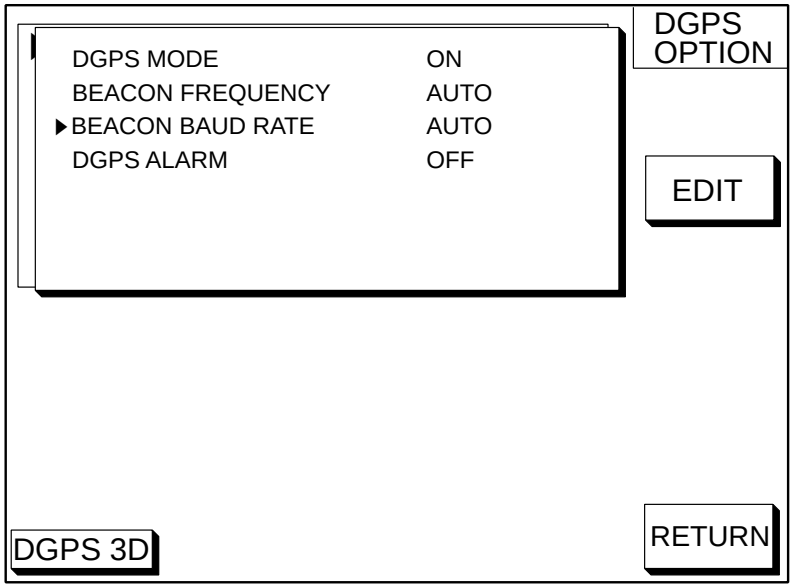


Figure 3-5 DGPS Setup Options Display

4. Confirm that "ON" is selected at "DGPS MODE" field for GP-1850D.
5. Select "BEACON BAUD RATE" by the arrow key.
6. Press the software key labeled "EDIT" to display the following message.

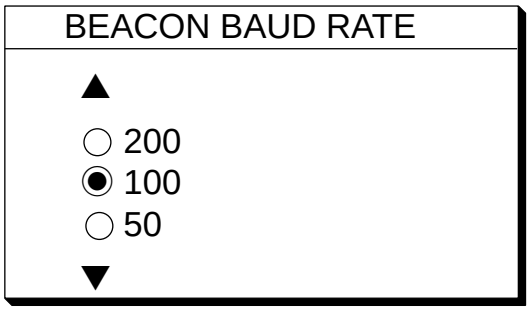


Figure 3-6 Beacon Baud Rate Display

7. Select beacon baud rate corresponding to DGPS reference station to use.
8. Press the [ENTER] key.
9. Press the [PLOT] key to finish.

3.5 Beacon Frequency Setting (GP-1850D only)

1. Press the [MENU] key.
2. Press the software key labeled "GPS/DGPS/TD OPTIONS".
3. Press the software key labeled "DGPS SETUP OPTIONS" to display the following message.

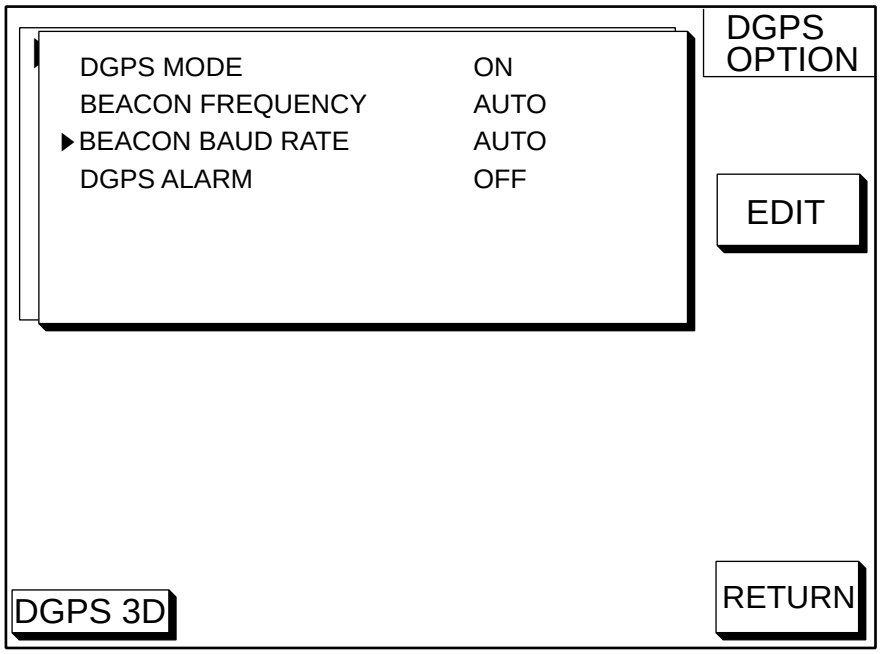


Figure 3-7 DGPS Setup Options Display

4. Select "BEACON FREQUENCY" by the arrow key.
5. Press the software key labeled "EDIT" to display the following message.

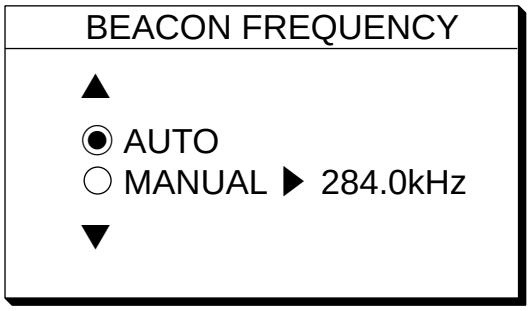


Figure 3-8 Beacon Frequency Display

6. Select "AUTO" or "MANUAL" by the arrow key. When you select "MANUAL", operate the cursor pad to move the cursor to frequency dialog box. And press the arrow key to select the frequency desired.
7. Press the [ENTER] key.
8. Press the [PLOT] key to finish.

4. Installation of DGPS Beacon Receiver (for GP-1850)

The DGPS beacon receiver GR-7000A can be incorporated in the GP-1850 to provide it with DGPS capability. Six installation kits are available as shown.

GR-802-1650-10A-018 (W/whip ant.)
GR-802-1650-10N-018

Name	Type	Code No.	Qty
Antenna Unit	GPA-018	000-041-471	1
Beacon Receiver	GR-7000A	000-143-249	1
Whip antenna (10A type only)	FAW-1.2	000-130-046	1
Connector Assy.	PH6P-W-L240	000-141-548	1
Cable tie	CV-100	000-570-322	2
Pan head screws*	M3X10 C2700W	000-881-405	4
Screw*	M3X12 SUS304	000-805-905	6
Cable Assy.*	S.FL2-2LP0.7-D-WHT (121)	000-141-491	1
Clamp	HP-2N	000-570-000	1
Cable Assy.	S.FL2-2LP0.7-D-WHT (250)	000-143-877	1
Screw	3X8 SUS410	000-802-951	4

* Not used

GR-802-1650-15A-018S (W/whip ant.)
GR-802-1650-15N-018S

Name	Type	Code No.	Qty
Antenna Unit	GPA-018S	000-041-462	1
Beacon Receiver	GR-7000A	000-143-249	1
Cable Assy.	TNC-PS-3D-15	000-133-670	1
Whip antenna (15A type only)	FAW-1.2	000-130-046	1
Connector Assy.	PH6P-W-L240	000-141-548	1
Cable tie	CV-100	000-570-322	2
Pan head screws*	M3X10 C2700W	000-881-405	4
Screw*	M3X12 SUS304	000-805-905	6
Cable Assy.*	S.FL2-2LP0.7-D-WHT (121)	000-141-491	1
Clamp	HP-2N	000-570-000	1
Cable Assy.	S.FL2-2LP0.7-D-WHT (250)	000-143-877	1
Screw	3X8 SUS410	000-802-951	4

* Not used

GR-802-1650-10N-019

Name	Type	Code No.	Qty
Antenna Unit	GPA-019	000-041-552	1
Beacon Receiver	GR-7000A	000-143-249	1
Connector Assy.	PH6P-W-L240	000-141-548	1
Cable tie	CV-100	000-570-322	2
Pan head screws*	M3X10 C2700W	000-881-405	4
Screw*	M3X12 SUS304	000-805-905	6
Cable Assy.*	S.FL2-2LP0.7-D-WHT (121)	000-141-491	1
Clamp	HP-2N	000-570-000	1
Cable Assy.	S.FL2-2LP0.7-D-WHT (250)	000-143-877	1
Screw	3X8 SUS410	000-802-951	4

* Not used

GR-802-1650-15N-019S

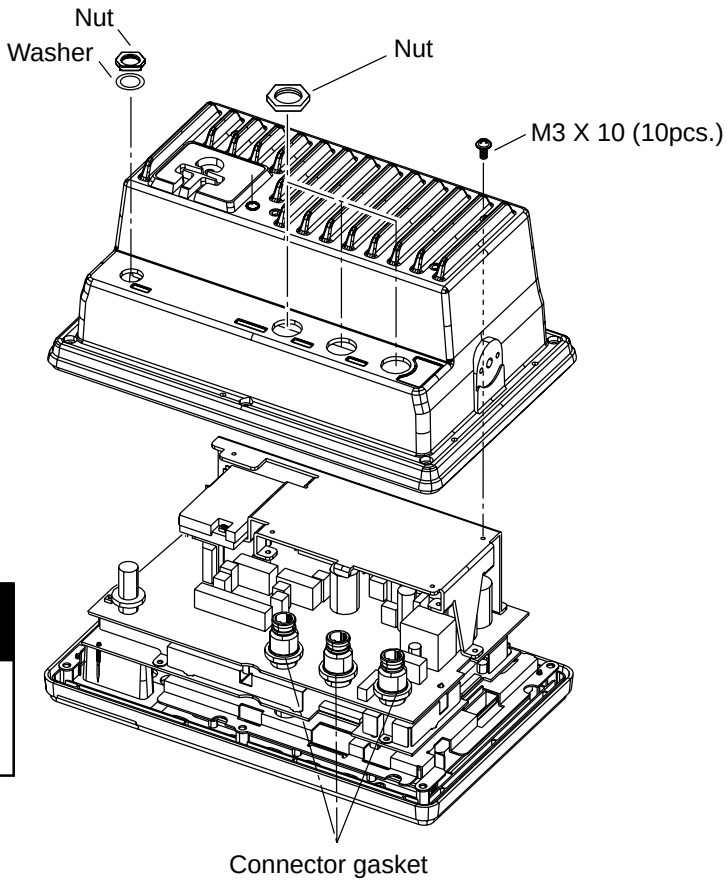
Name	Type	Code No.	Qty
Antenna Unit	GPA-019S	000-041-554	1
Beacon Receiver	GR-7000A	000-143-249	1
Cable Assy.	TNC-PS-3D-15	000-133-670	1
Connector Assy.	PH6P-W-L240	000-141-548	1
Cable tie	CV-100	000-570-322	2
Pan head screws*	M3X10 C2700W	000-881-405	4
Screw*	M3X12 SUS304	000-805-905	6
Cable Assy.*	S.FL2-2LP0.7-D-WHT (121)	000-141-491	1
Clamp	HP-2N	000-570-000	1
Cable Assy.	S.FL2-2LP0.7-D-WHT (250)	000-143-877	1
Screw	3X8 SUS410	000-802-951	4

* Not used

Disassembly

Procedure

1. Turn off the power. Wait at least one minute before opening the cover, to allow capacitors to discharge.
2. Remove nuts attached to DGPS, NMEA and power supply connectors at the rear of the display unit.



⚠ WARNING

Do not connect the power cable with the cover removed.

Figure 4-1 Removing cover assembly

3. Remove nut and washer attached to ANT connector.
4. Remove ten screws at rear of the display unit to detach panel/chassis assembly from the cover assembly.

Installation of DGPS receiver

Procedure

1. Dismount chassis assembly from panel/chassis assembly by disconnecting the connector and PH8P from J8 on MAIN Board shown in the figure below.

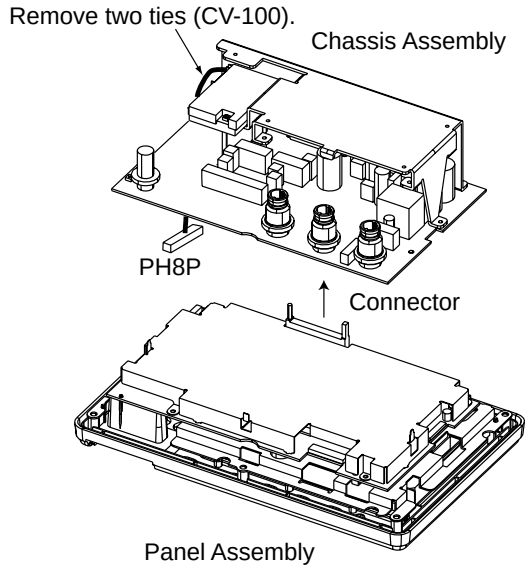


Figure 4-2 Dismounting chassis assembly

2. Dismount heat sink from chassis assembly by unfastening three screws on the ANLG board, loosening a screw at TR fixing plate and disconnecting the connector of the mini pin coax cable.

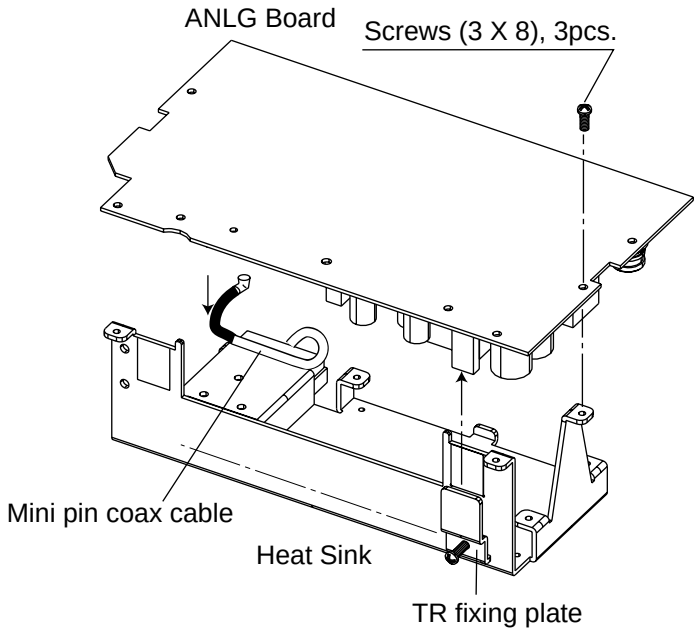


Figure 4-3 Chassis assembly

Handling of Coaxial Cable

- Do not touch the connector with bare hands; use gloves.
- Use radio pincers to remove, and pull out straightly.
- Plug in connector straightly.

3. Fasten the GR-7000A (DGPS beacon receiver) to the heat sink with four 3X8 screws as shown in the figure below.

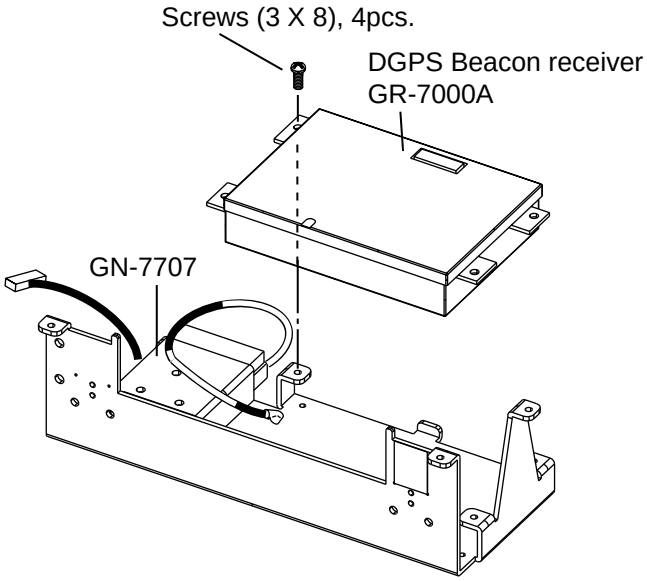


Figure 4-4 Installation of DGPS beacon receiver

4. Open the cover of GR-7000A to connect two coaxial cables shown below.

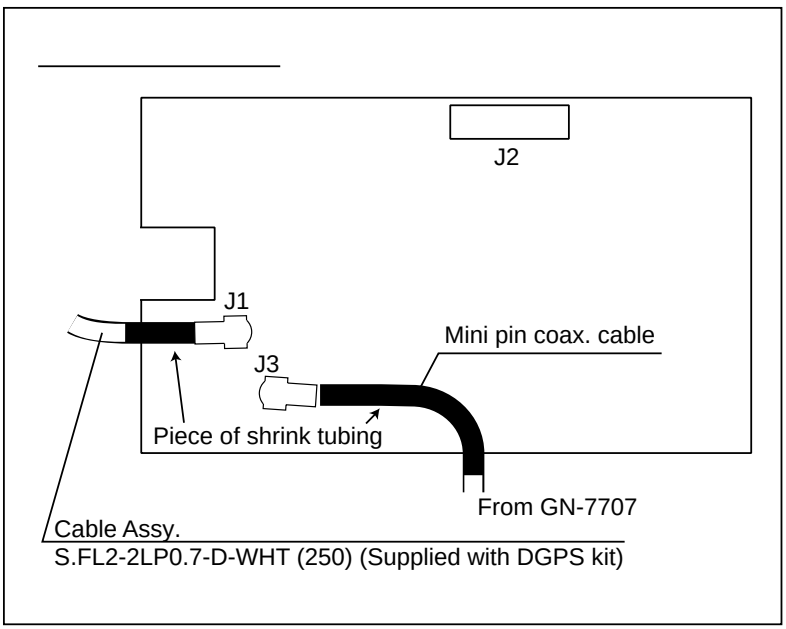


Figure 4-5 Connecting the coaxial cables in GR-7000A

5. Close the cover of GR-7000A passing the two cables out through respective notches in the cover.
6. Plug PH6P-W-L240 connector to J2 on the GR-7000A through the cover.

7. Wire cable assembly as shown in the figure below.

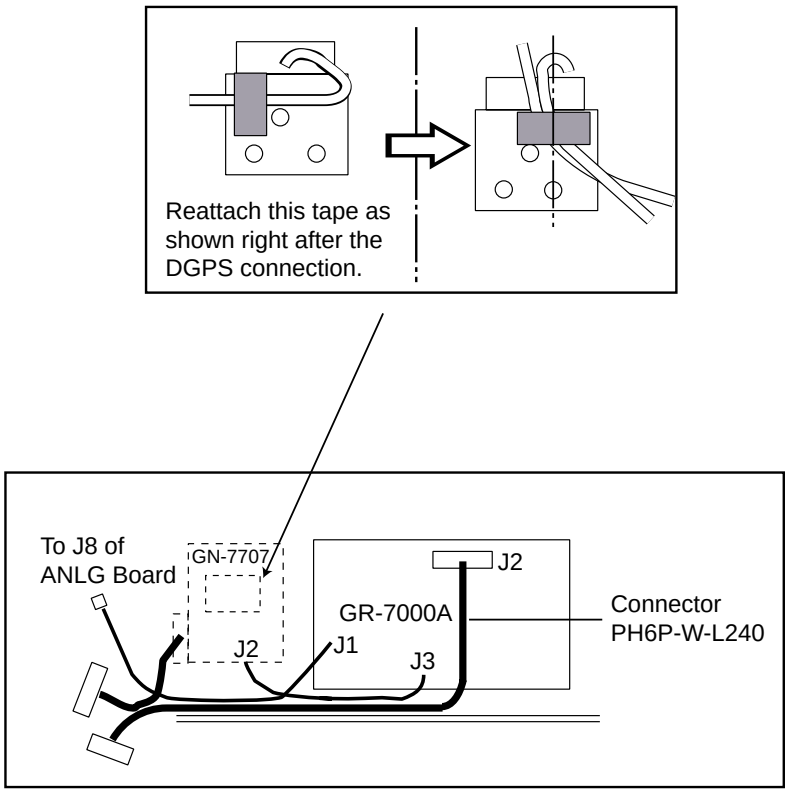


Figure 4-6 Wiring the Cable assembly

8. Mount the ANLG board on the heat sink referring to step 2. Fasten cable assy. S.FL2-2LP0.7-D-WHT (250), 8P connector cable and 6P connector cable by cable tie as shown in the figure below. Fix cable assy. S.FL2-2LP0.7-D-WHT (250) with the vinyl tape.

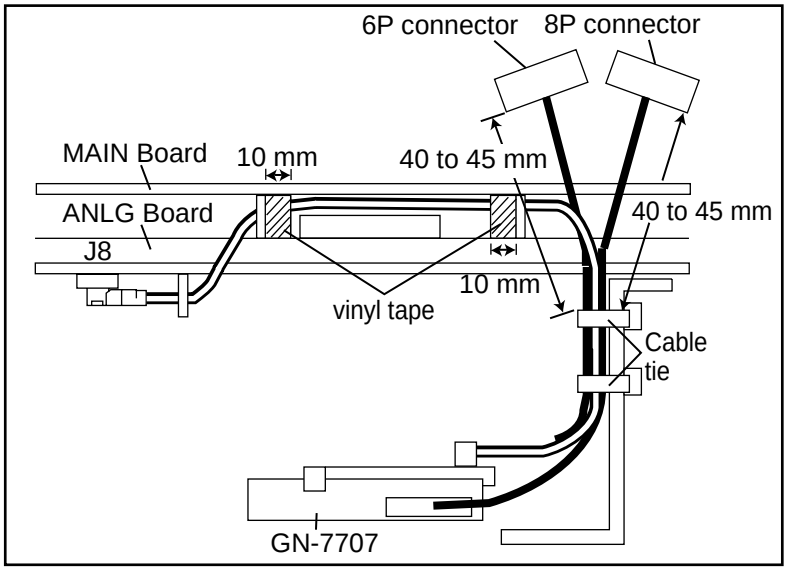


Figure 4-7 Attaching cable tie

9. Connect J1 of GR-7000A to J8 of ANLG board (Refer to Figure 4-6).

10. Mount chassis assembly on the panel assembly. Connect 8P connector and 6P connector to Main board as shown in Figure 4-8.

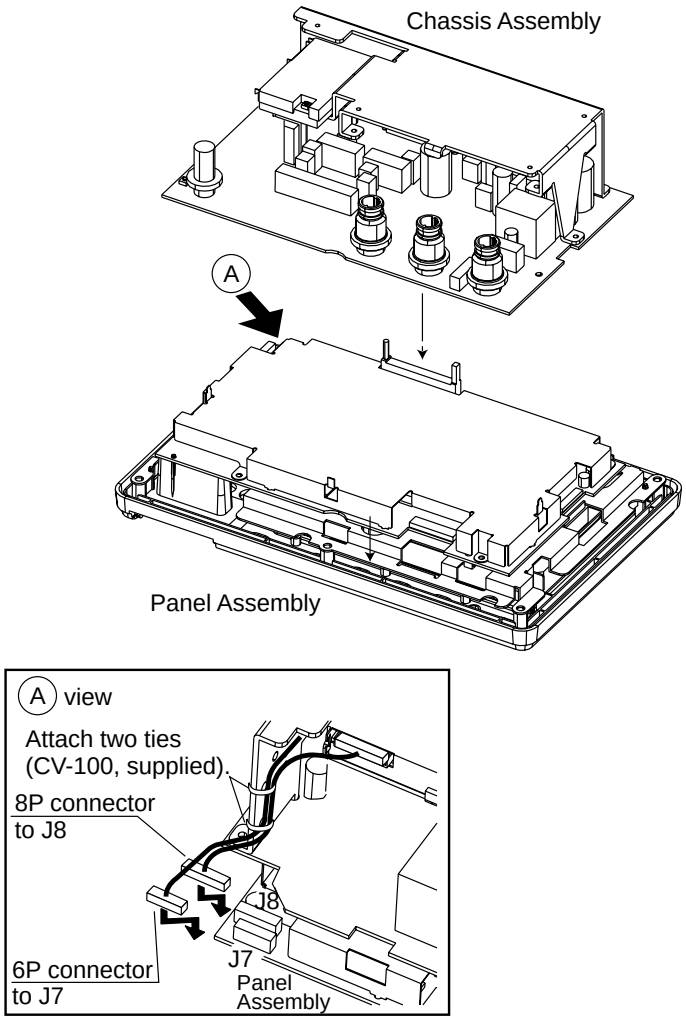


Figure 4-8 Attaching chassis assembly

11. Reassemble the display unit.

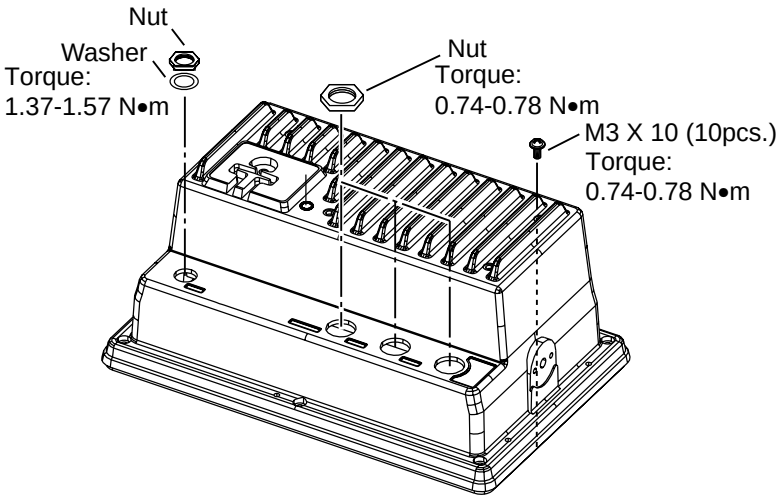


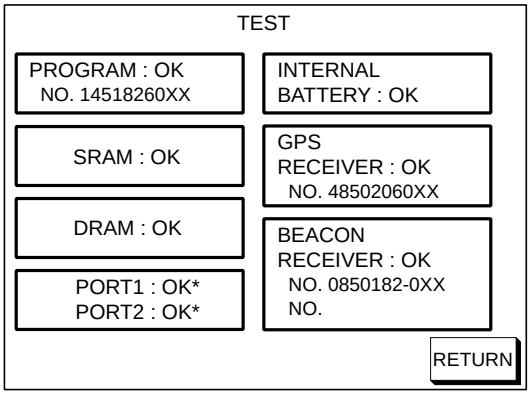
Figure 4-9 Remounting the cover

Note : When reattaching the cover, confirm the following parts are attached.

- Inside of the cover : Shield gasket, GN gasket (See Figure 4-10.)
- On ANLG Board : Connector gasket (See Figure 4-1.)

Checking the DGPS installation

1. Press the [MENU] key.
2. Press the software key labeled "CONFIGURATION".
3. Press the software key labeled "SYSTEM MENU".
4. Press the software key labeled "SELF TEST".
5. Press the software key labeled "MEMORY•I/O TEST" to display the following message.



*: Special connections are required to check these ports.
Otherwise, "--" (bar) appears.

Figure 4-10 Memory, I/O Test Display

6. Confirm that "BEACON RECEIVER: OK" is displayed.
7. Press the software key labeled "RETURN".
8. Press the [PLOT] key to return the plotter display.

Connecting DGPS beacon receiver

A DGPS beacon receiver whose output format is RS-232C can be connected to the GP-1850.

Below is the example of interconnection between the GP-1850 and FURUNO beacon receiver GR-80.

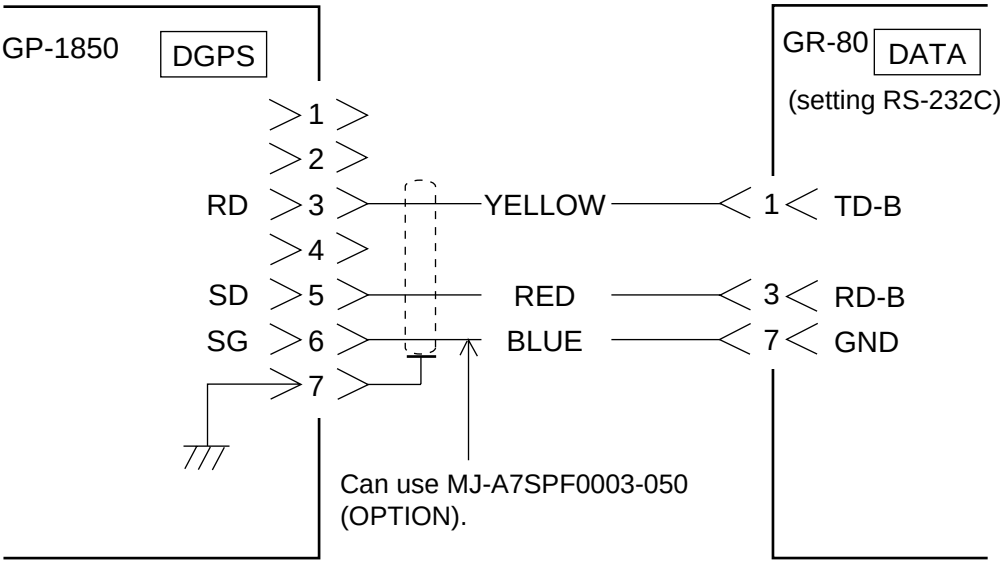
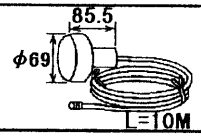
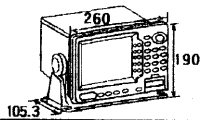
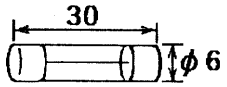
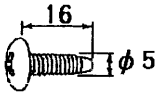
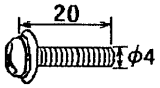
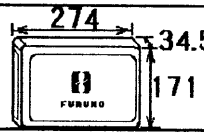


Figure 4-11 Connecting DGPS beacon receiver

PACKING LIST GP-1850 (E017)

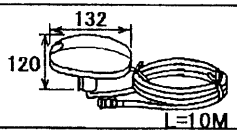
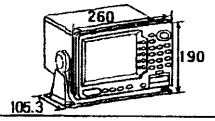
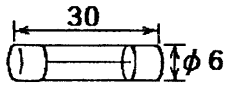
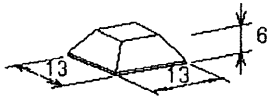
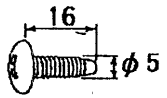
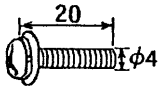
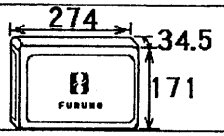
NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
空中線部 ANTENNA UNIT		GPA-017 000-041-403	1
指示器 DISPLAY UNIT		GP-1850-E 000-041-489	1
予備品 SPARE PARTS			**SP14-02501**
ﾋｭｰｽﾞ FUSE		FGBO-A 5A AC125V 000-549-064	3
付属品 ACCESSORIES			**FP14-02403**
ｺﾞﾑｱｼ RUBBER FOOT		TM-166 No.18 ｸﾛ 000-808-732	2
+ﾄﾗｽﾀｯﾋﾟﾝﾈｼﾞ +TAPPING SCREW		5X16 SUS304 1種 000-805-494	4
+ﾅﾍﾞｾﾑｽﾈｼﾞB WASHER HEAD SCREW		M4X20 SUS304 000-804-742	6
付属品 ACCESSORIES			**FP14-02401**
ﾊｰﾄﾞｶﾊﾞｰ組品 HARD COVER ASSY.		FP14-02401 004-375-270	1

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
その他工材 OTHER INSTALLATION MATERIALS			
ｹｰﾌﾞﾙ組品MJ CABLE ASSY.		MJ-A3SPF0013-035 000-129-613	1
ｹｰﾌﾞﾙ組品MJ CABLE ASSY.		MJ-A6SPF0003-050 000-117-603	1

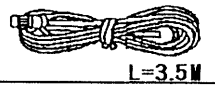
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

DWG NO.
C4395-Z09- B

PACKING LIST GP-1850D (E018)

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
空中線部 ANTENNA UNIT		GPA-018 000-041-407	1
指示器 DISPLAY UNIT		GP-1850D-E 000-041-491	1
予備品 SPARE PARTS			SP14-02501
ﾋｭｰｽﾞ FUSE		FGBO-A 5A AC125V 000-549-064	3
付属品 ACCESSORIES			FP14-02403
ｺﾞﾑｱｼ RUBBER FOOT		TM-166 No.18 ｸﾛ 000-808-732	2
+ﾄﾗｽﾀｯﾋﾟﾝﾈｼﾞ +TAPPING SCREW		5X16 SUS304 1種 000-805-494	4
+ﾅﾍﾞｾﾑｽﾈｼﾞB WASHER HEAD SCREW		M4X20 SUS304 000-804-742	6
付属品 ACCESSORIES			FP14-02401
ﾊｰﾄﾞｶﾊﾞｰ組品 HARD COVER ASSY.		FP14-02401 004-375-270	1

注記) 1.ﾎｲｯﾌﾟｱﾝﾃﾅ他ｵﾌﾟｼｮﾝ等は別梱包になります。
OPTIONS, FOR EXAMPLE WHIP ANTENNA ARE SUPPLIED IN OTHER BOX.

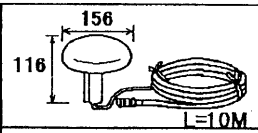
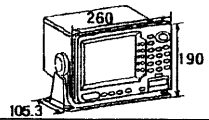
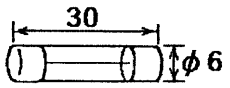
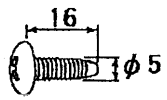
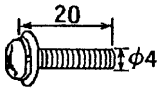
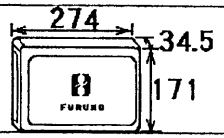
NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
その他工材 OTHER INSTALLATION MATERIALS			
ｹｰﾌﾞﾙ組品MJ CABLE ASSY.		MJ-A3SPF0013-035 000-129-613	1
ｹｰﾌﾞﾙ組品MJ CABLE ASSY.		MJ-A6SPF0003-050 000-117-603	1

DWG NO.
C4395-Z11- A

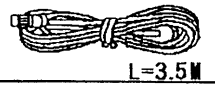
A-2

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

PACKING LIST GP-1850D (E019)

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
空中線部 ANTENNA UNIT		GPA-019 000-142-416	1
指示器 DISPLAY UNIT		GP-1850D-E 000-041-491	1
予備品 SPARE PARTS			SP14-02501
ﾋｭｰｽﾞ FUSE		FGB0-A 5A AC125V 000-549-064	3
付属品 ACCESSORIES			FP14-02403
ｺﾞﾑｱｼ RUBBER FOOT		TM-166 No.18 ｸﾛ 000-808-732	2
+ﾄﾗｽﾀｯﾋﾟﾝﾈｼﾞ +TAPPING SCREW		5X16 SUS304 1種 000-805-494	4
+ﾅﾍﾞｾﾑｽﾈｼﾞB WASHER HEAD SCREW		M4X20 SUS304 000-804-742	6
付属品 ACCESSORIES			FP14-02401
ﾊｰﾄﾞｶﾊﾞｰ組品 HARD COVER ASSY.		FP14-02401 004-375-270	1

注記)

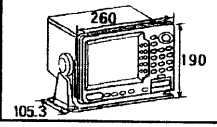
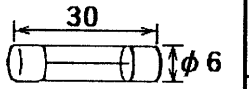
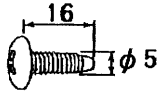
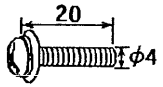
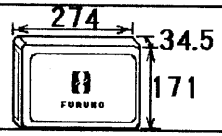
NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
その他工材 OTHER INSTALLATION MATERIALS			
ｹｰﾌﾞﾙ組品MJ CABLE ASSY.		MJ-A3SPF0013-035 000-129-613	1
ｹｰﾌﾞﾙ組品MJ CABLE ASSY.		MJ-A6SPF0003-050 000-117-603	1

DWG NO.
C4395-Z07- B

A-3

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

PACKING LIST GP-1850D/DF (E/J)

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
指示器 DISPLAY UNIT		GP-1850D-J	1
		000-041-490**	
予備品 SPARE PARTS		**SP14-02501**	
ﾋｭｰｽﾞ FUSE		FGBO-A 5A AC125V	3
		000-549-064	
付属品 ACCESSORIES		**FP14-02403**	
ｺﾞﾑｱｼ RUBBER FOOT		TM-166 No.18 ｸﾛ	2
		000-808-732	
+ﾄﾗｽﾀｯﾋﾟﾝﾈｼﾞ +TAPPING SCREW		5X16 SUS304 1種	4
		000-805-494	
+ﾅﾍﾞｾﾑｽﾈｼﾞB WASHER HEAD SCREW		M4X20 SUS304	6
		000-804-742	
付属品 ACCESSORIES		**FP14-02401**	
ﾊｰﾄﾞｶﾊﾞｰ組品 HARD COVER ASSY.		FP14-02401	1
		004-375-270	
その他工材 OTHER INSTALLATION MATERIALS			

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ｹｰﾌﾞﾙ組品MJ CABLE ASSY.		MJ-A3SPF0013-035	1
		000-129-613	
ｹｰﾌﾞﾙ組品MJ CABLE ASSY.		MJ-A6SPF0003-050	1
		000-117-603	

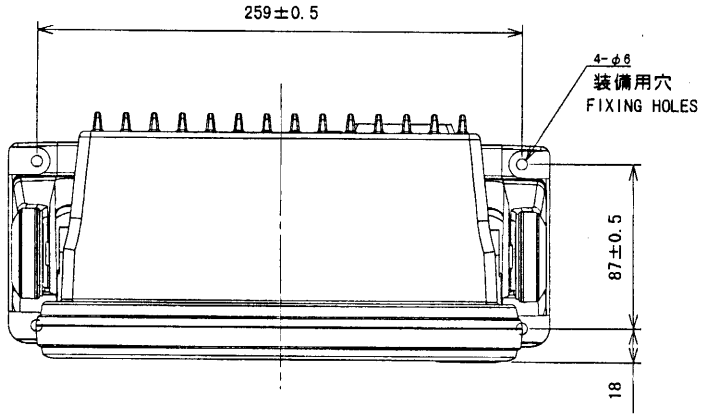
注記) 1.ｺｰﾄﾞ末尾に[**]の付いたﾕﾆｯﾄは代表の型式/ｺｰﾄﾞを表示しています。
DOUBLE ASTERISK DENOTES COMMONLY USED EQUIPMENT.
2.送受波器他ｵﾌﾟｼｮﾝ等は別梱包になります。
OPTIONS, FOR EXAMPLE WHIP ANTENNA ARE SUPPLIED IN OTHER BOX.
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

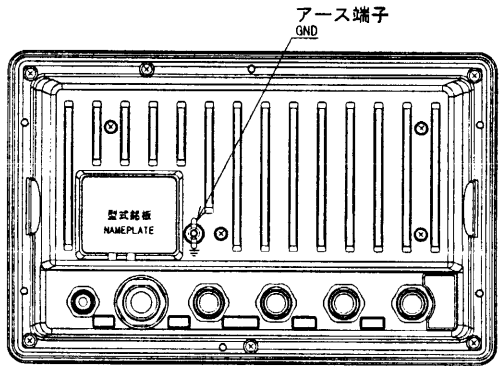
DWG NO.
C4395-Z13- B

FURUNO

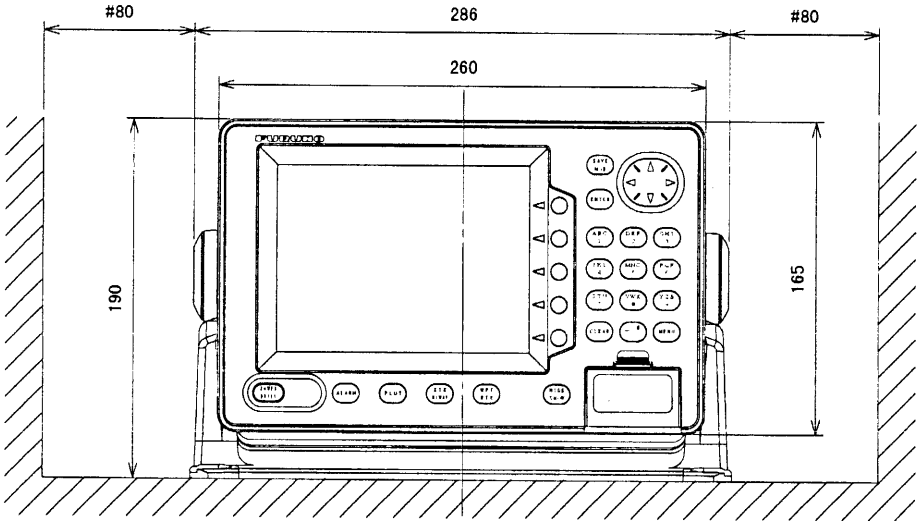
寸法区分(mm) DIMENSION	公差(mm) TOLERANCE
L ≦ 50	±1.5
50 < L ≦ 100	±2.5
100 < L ≦ 500	±3

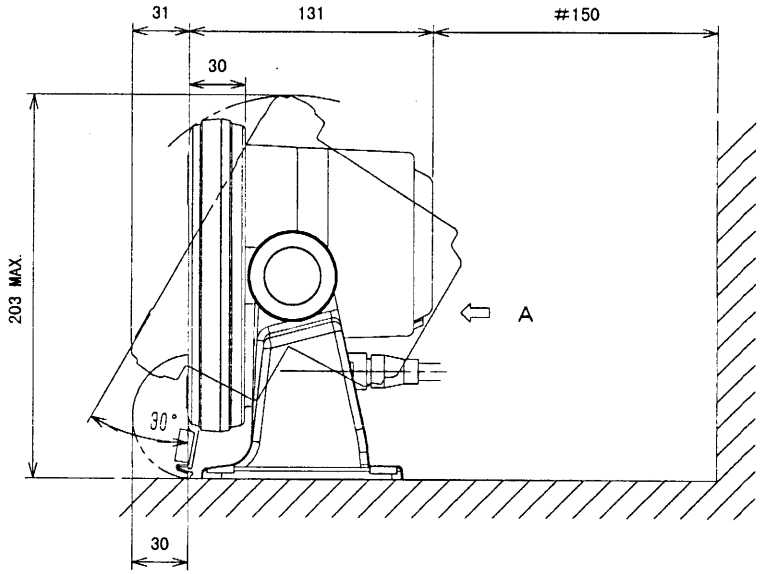
表 1 TABLE 1





矢視 A VIEW A





注 記

1）装備ケーブルはサービス時、指示部を前方に十分引き出せるよう余裕を持たせること。
2）取付用ネジはトラスタッピングネジ呼び径5×16を使用のこと。
3）指定外寸法公差は、表1による。
4）#印寸法は最小サービス空間とする。

NOTE

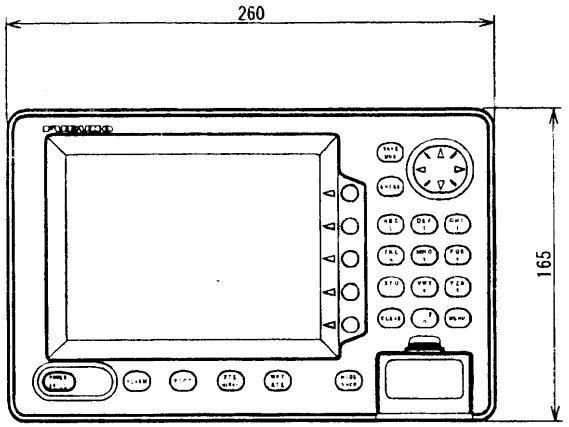
1. KEEP ENOUGH CABLE LENGTH BEHIND UNIT.
2. USE φ5x16 TAPPING SCREW FOR FIXING UNIT.
3. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
4. #: RECOMMENDED SERVICE CLEARANCE.

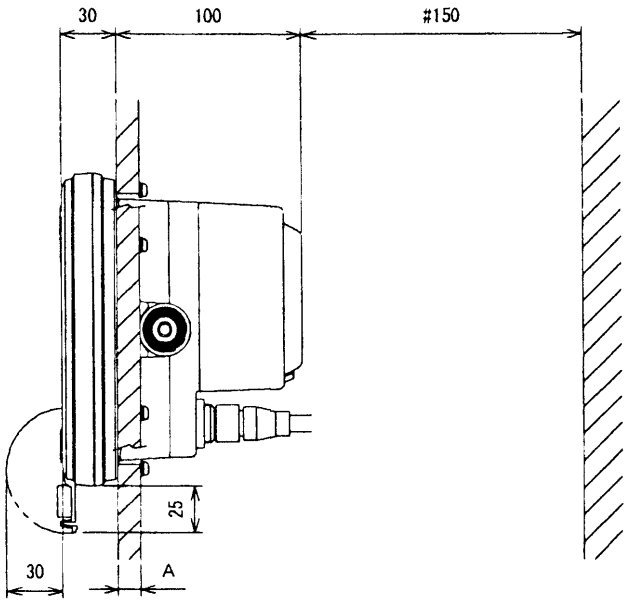
DRAWN Dec 8'98 T.Yamazaki		TITLE	GP-1850/D/F/DF
CHECKED Dec 8'98 K.Kusunoki		名称	指示部（ハンガー付）
APPROVED Dec 8'98 K.Kusunoki			外寸図
SCALE 1/4 MASS 3.0 kg		NAME	DISPLAY UNIT W/ HANGER
DWG. No. C4395-G01- A	14-063-1000-G1		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

D-1

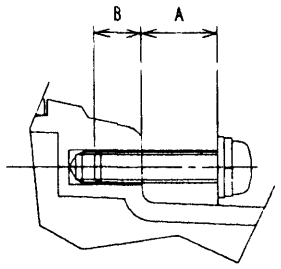
FURUNO



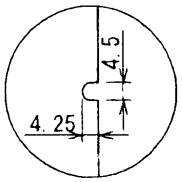


寸法区分(mm) DIMENSION	公差(mm) TOLERANCE
L ≦ 50	±1.5
50 < L ≦ 100	±2.5
100 < L ≦ 500	±3

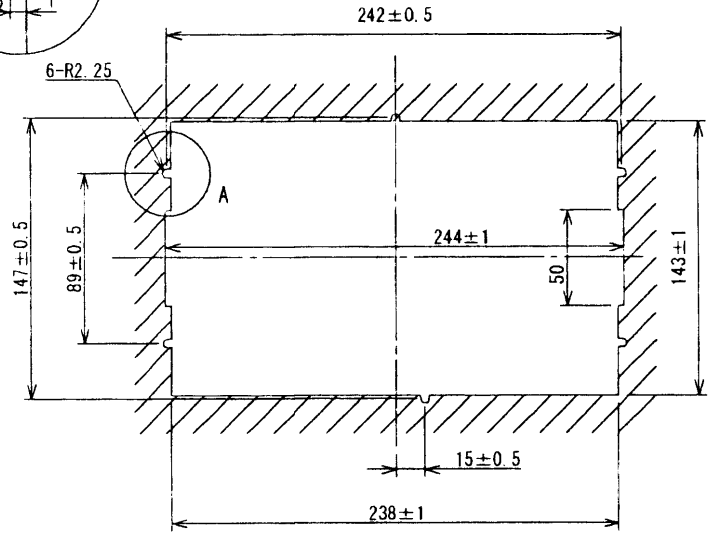
表 1 TABLE 1



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



A部詳細
DETAIL OF 'A'



取付穴寸法（正面）
CUTOUT DIMENSIONS (FRONT)

注　記

1）装備ケーブルはサービス時、指示部を前方に十分引き出せるよう余裕を持たせること。
2）取付用ネジは、セムスネジB M4X20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以上入れないこと。（B≦７）
3）指定外寸法公差は、表１による。
4）#印寸法は最小サービス空間とする。

NOTE

1. KEEP ENOUGH CABLE LENGTH BEHIND UNIT.
2. USE φ4x20 TAPPING SCREWS FOR FIXING THE UNIT.
THICKNESS A: 11≦A≦14 OR SCREW LENGTH: (A+7.3)±1.5.
DO NOT FASTEN SCREWS INTO UNIT MORE THAN 7 mm. (B≦7)
3. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
4. #: RECOMMENDED SERVICE CLEARANCE.

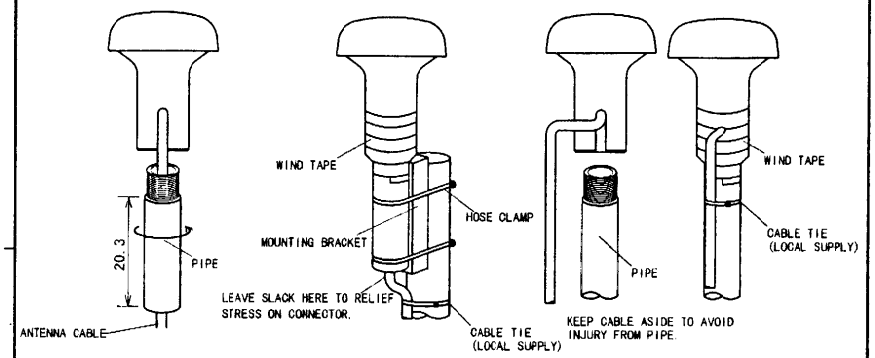
DRAWN Jan 21 '01 T. YAMASAKI		TITLE	GP-1850/D/F/DF
CHECKED Jan 22 '01 Y. K.		名称	指示部（フラッシュマウント）
APPROVED Jan 23 '01 S. Yoshimura			外寸図
SCALE 1/4 MASS ±10% 2.8 kg		NAME	DISPLAY UNIT(FLASH MOUNT)
DWG. No C4395-G02- B	14-063-1100-GI		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD

A) MAST MOUNTING

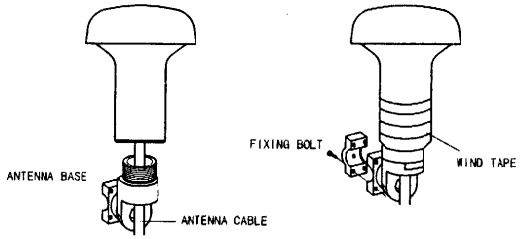
a) USE MAST MOUNTING KIT CP20-01111.

b) USE A PIPE ONLY.



B) HANDRAIL MOUNTING

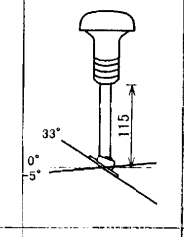
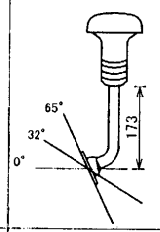
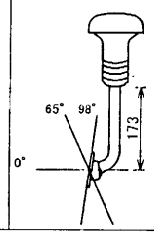
USE HANDRAIL MOUNTING BASE No. 13-RC5160 (CODE No. 000-806-114, OPTION).
THE DIAMETER OF THE HANDRAIL MAY BE FROM ϕ19mm TO ϕ32mm.



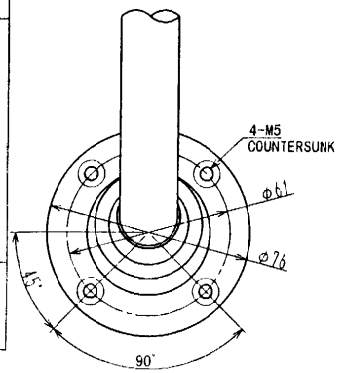
NOTE 1. FASTEN PIPE(ANTENNA BASE) TO ANTENNA UNIT FIRST THEN FIX THEM TO MAST OR HANDRAIL.
2. WHEN FIXING ANTENNA, TURN PIPE OR ANTENNA BASE; NOT THE ANTENNA.
TURNING THE ANTENNA MAY TWIST THE CABLE AND PLACE STRESS ON CONNECTOR.

C) ANTENNA BASE MOUNTING

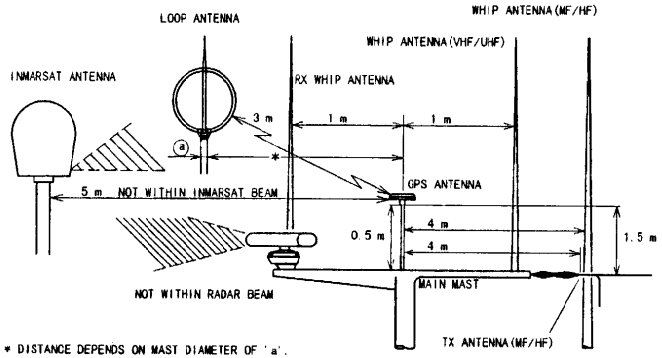
USE OPTIONAL ANTENNA BASE No. 13-QA330/QA310.

INCLINATION	-5° - 33°	32° - 65°	65° - 98°
MOUNTING METHOD			
ANTENNA BASE TYPE	RIGHT ANGLE ANTENNA BASE No. 13-QA330	L-TYPE ANTENNA BASE No. 13-QA310	
CODE No.	000-803-239	000-803-240	

MOUNTING DIMENSIONS OF ANTENNA BASE

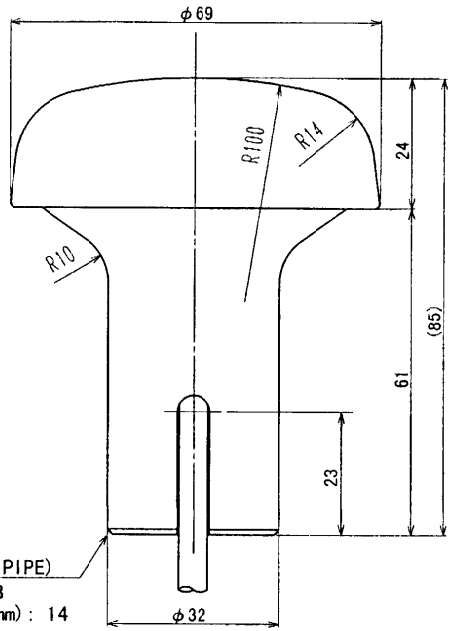


MOUNTING LOCATION THE FIGURE BELOW SHOWS THE RECOMMENDED SEPARATION DISTANCES FROM OTHER ANTENNAS TO AVOID MUTUAL INTERFERENCE.



* DISTANCE DEPENDS ON MAST DIAMETER OF 'a'.

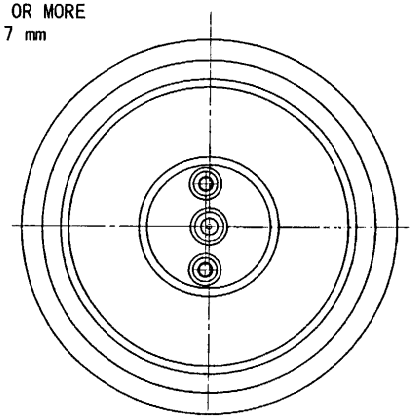
DIA. OF 'a'	DISTANCE (MIN.)
10 cm	1.5 m
30 cm	3 m



DIMENSION (mm)	TOL. (mm)
L ≦ 50	±1.5
50 < L ≦ 100	±2.5
100 < L ≦ 500	±3

TABLE 1

THREAD DIMENSION (FOR PIPE)
THREAD TYPE: 1x14UNS1B
THREADS PER INCH(25.4mm): 14
PITCH: 1.8143 mm
THREAD LENGTH: 19 mm OR MORE
PITCH DIAMETER: 24.17 mm



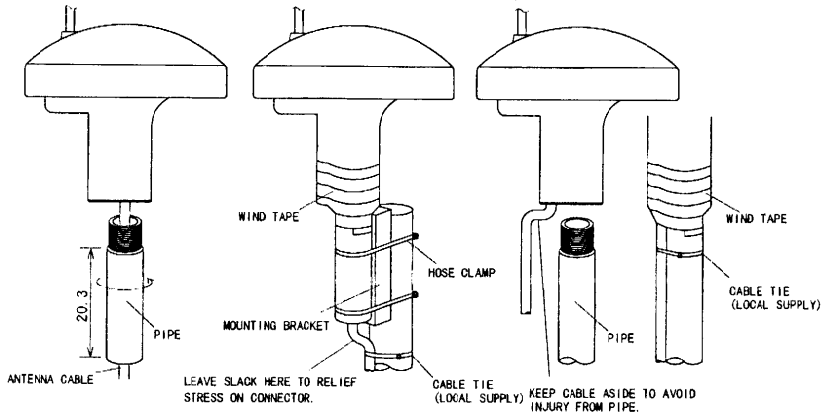
NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.

DRAWN May 26'99 T.YAMASAKI			TITLE GPA-017
CHECKED May 26'99 K.KUSUNOKI			名称 空中線部
APPROVED May 26'99 K.KUSUNOKI			外寸図
SCALE 1/1	MASS 0.59 kg		NAME ANTENNA UNIT
DWG. No. E4384-G04- E			OUTLINE DRAWING

FURUNO

A) MAST MOUNTING

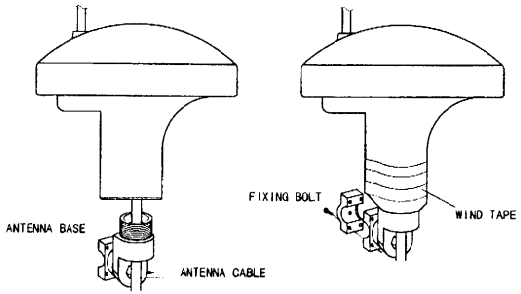
a) USE MAST MOUNTING KIT OP20-01111.



b) USE A PIPE ONLY.

B) HANDRAIL MOUNTING

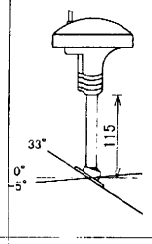
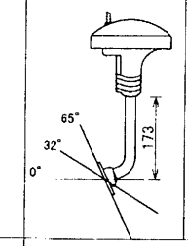
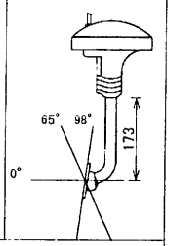
USE HANDRAIL MOUNTING BASE No. 13-RC5160 (CODE No. 000-806-114, OPTION).
THE DIAMETER OF THE HANDRAIL MAY BE FROM ϕ19mm TO ϕ32mm.



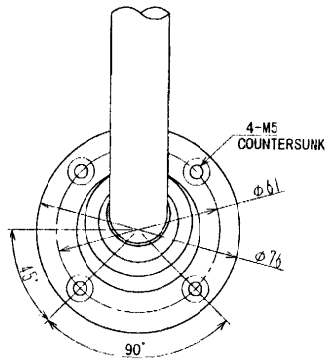
NOTE 1. FASTEN PIPE(ANTENNA BASE) TO ANTENNA UNIT FIRST THEN FIX THEM TO MAST OR HANDRAIL.
2. WHEN FIXING ANTENNA, TURN PIPE OR ANTENNA BASE; NOT THE ANTENNA.
TURNING THE ANTENNA MAY TWIST THE CABLE AND PLACE STRESS ON CONNECTOR.

C) ANTENNA BASE MOUNTING

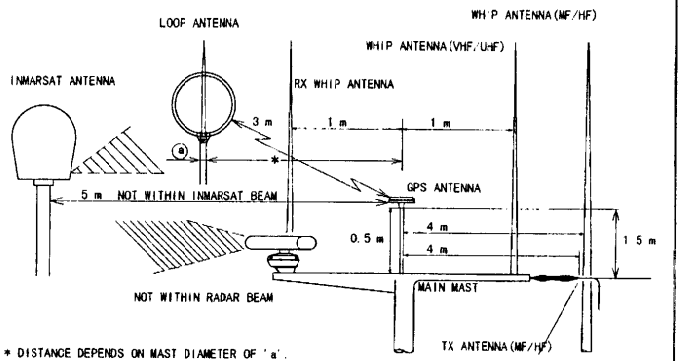
USE OPTIONAL ANTENNA BASE No. 13-QA330/QA310.

INCLINATION	-5° - 33°	32° - 65°	65° - 98°
MOUNTING METHOD			
ANTENNA BASE TYPE	RIGHT ANGLE ANTENNA BASE No. 13-QA330	L-TYPE ANTENNA BASE No. 13-QA310	
CODE No.	000-803-239	000-803-240	

MOUNTING DIMENSIONS OF ANTENNA BASE

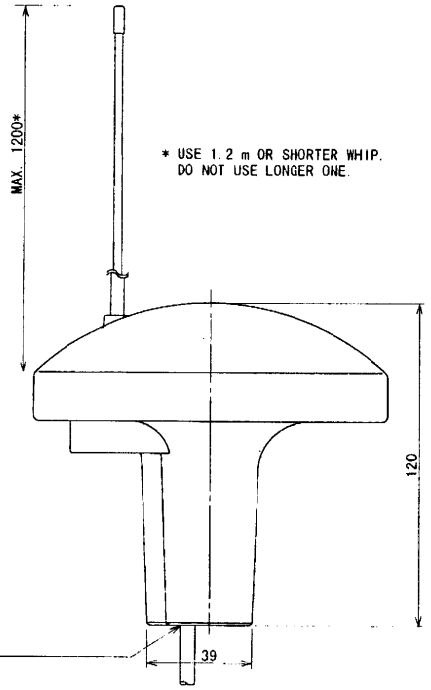


MOUNTING LOCATION THE FIGURE BELOW SHOWS THE RECOMMENDED SEPARATION DISTANCES FROM OTHER ANTENNAS TO AVOID MUTUAL INTERFERENCE.



* DISTANCE DEPENDS ON MAST DIAMETER OF 'a'.

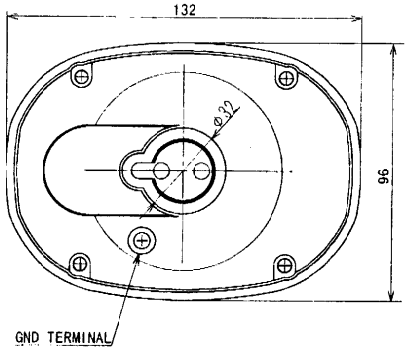
DIA. OF 'a'	DISTANCE (MIN.)
10 cm	1.5 m
30 cm	3 m



DIMENSION (mm)	TOL. (mm)
L ≦ 50	±1.5
50 < L ≦ 100	±2.5
100 < L ≦ 500	±3

TABLE 1

THREAD DIMENSION (FOR PIPE)
THREAD TYPE: 1x14UNS1B
THREADS PER INCH(25.4mm): 14
PITCH: 1.8143 mm
THREAD LENGTH: 19 mm OR MORE
PITCH DIAMETER: 24.17 mm



NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.

TYPE	CABLE LENGTH(m)	PLUG	MASS (kg)
GPA-018	10	TNC-P-3	0.79
GPA-018S	0.2	TNC-J-3	0.35

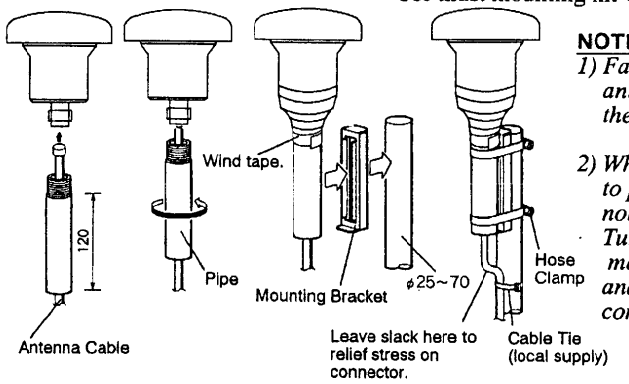
TABLE 2

DRAWN	May 26 '99 T.YAMASAKI	TITLE	GPA-018/018S
CHECKED	May 26 '99 K.KUSUHOKI	名称	空中線部
APPROVED	May 26 '99 K.KUSUHOKI		外寸図
SCALE	1/2 MASS TABLE 2	NAME	ANTENNA UNIT
DWG. No.	E4385-G01- F		OUTLINE DRAWING

FURUNO

A) Mast mounting

Use mast mounting kit CP20-01111.



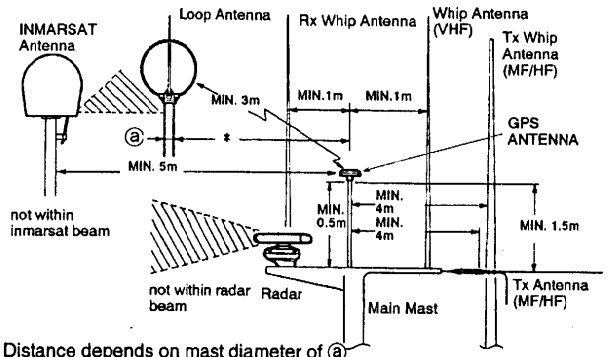
NOTES

1) Fasten pipe to antenna first then fix them to mast.

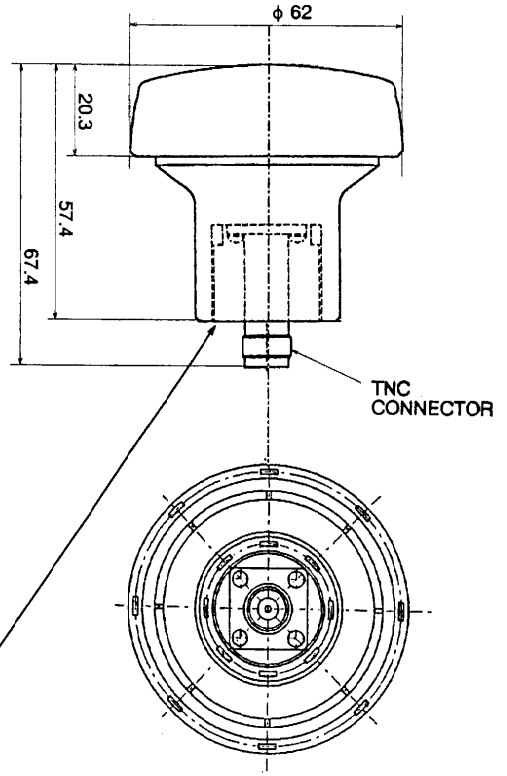
2) When fixing antenna to pipe, turn pipe; not the antenna. Turning the antenna may twist the cable and place stress on connector.

Mounting location

The figure below shows the recommended separation distances from other antennas to avoid mutual interference.

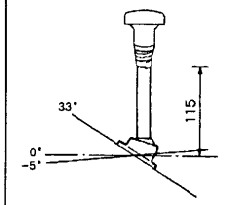
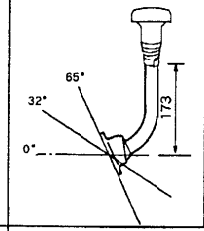
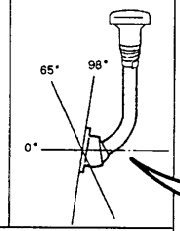


* Distance depends on mast diameter of ⓐ
ⓐ mast diameter 10cm : minimum 1.5m
ⓐ mast diameter 30cm : minimum 3m

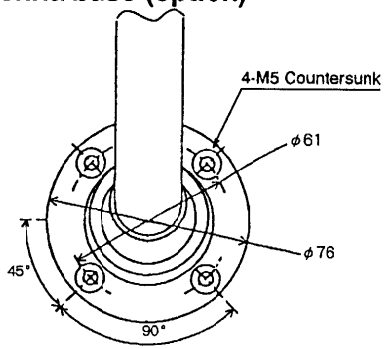


B) Antenna base mounting

Use optional antenna base No.13-QA300 or No.13-QA310.

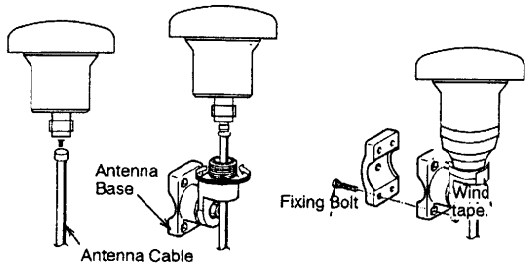
Inclination -5° to 33°	32° to 65°	65° to 98°
		
Right angle antenna base No.13-QA330 (code No. 000-803-239)	L-type antenna base No.13-QA310 (code No. 000-803-240)	

Mounting dimensions of antenna base (option)



Thread Type	Threads per 25.4 mm (1 inch)	Pitch	Thread Length	Pitch Diameter
1 × 14UNS1B	14	1.8143 mm	15.17 mm	24.17 mm

C) Handrail mounting



Use handrail mounting base No.13-RC5160 (Code No. 000-861-114, option). The diameter of the handrail may be from ϕ19mm to ϕ32mm.

NOTES

1) Fasten antenna base to antenna first then fix them to handrail.

2) When fixing antenna to antenna base, turn antenna base; not the antenna. Turning the antenna may twist the cable and place stress on connector.

DRAWN Nov 20'98 T.YAMASAKI	GP-50MK3 PS-8000M2 GP-1600/F GP-8000M2 GP-3100M2 GP-80		TYPE GPA-016
CHECKED Nov 24'98 K.KUSUNOKI			名称 空中線部
APPROVED Nov 24'98 K.KUSUNOKI			外寸図
SCALE 1/1	MASS 0.1kg	APPLICABLE TO; (MODEL)	BLOCK NO.	NAME ANTENNA UNIT
DWG NO. E4374-G04- F				OUTLINE DRAWING

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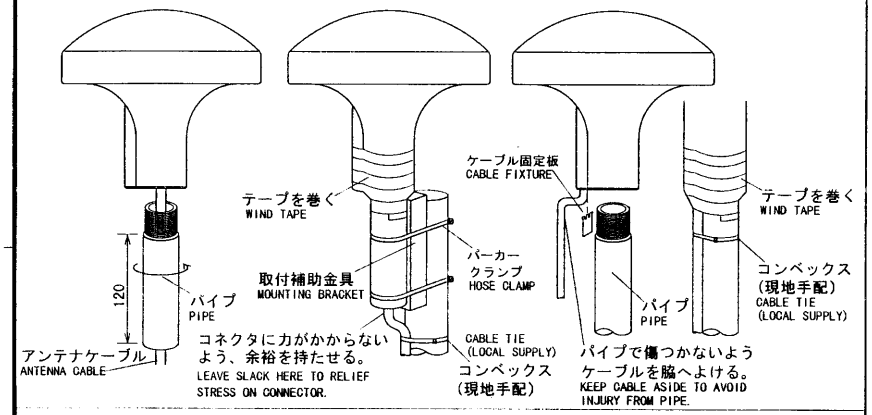
FURUNO

A) マストへの取付け　MAST MOUNTING

a) マスト取付金具CP20-01111(工事材料)でマストに固定する。
USE MAST MOUNTING KIT CP20-01111.

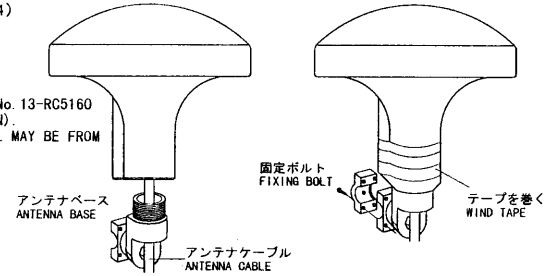
b) パイプのみを使うとき
USE A PIPE ONLY.



B) スタンションやパルピットにつけるとき　HANDRAIL MOUNTING

レール用アンテナベース No. 13-RC5160 (取付可能レール直径：φ19～φ32)
(コード番号：000-806-114)

USE HANDRAIL MOUNTING BASE No. 13-RC5160
(CODE No. 000-806-114, OPTION).
THE DIAMETER OF THE HANDRAIL MAY BE FROM
φ19mm TO φ32mm.

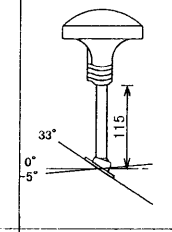
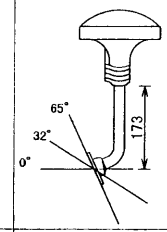
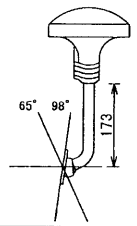


注記 1) パイプ(アンテナベース)はアンテナユニットにねじ込んだ後に固定する。
2) アンテナを固定するときはパイプ（アンテナベース）をアンテナにねじ込むこと。
アンテナ側をねじるとコネクタ部やケーブルに無理がかかり、故障の原因となる。

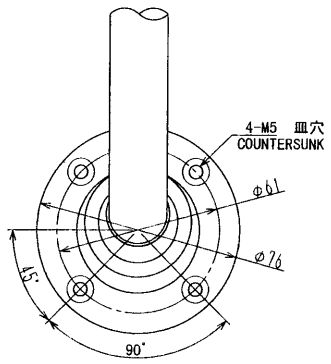
NOTE 1. FASTEN PIPE(ANTENNA BASE) TO ANTENNA UNIT FIRST THEN FIX THEM TO MAST OR HANDRAIL.
2. WHEN FIXING ANTENNA, TURN PIPE OR ANTENNA BASE; NOT THE ANTENNA.
TURNING THE ANTENNA MAY TWIST THE CABLE AND PLACE STRESS ON CONNECTOR.

C) 取付ける場所が傾斜しているとき　ANTENNA BASE MOUNTING

オプションのアンテナベースを使う。
USE OPTIONAL ANTENNA BASE No. 13-QA330/QA310.

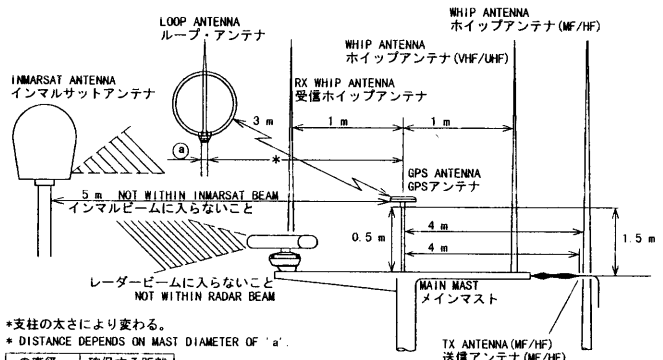
傾斜 INCLINATION	-5° - 33°	32° - 65°	65° - 98°
装備方法 MOUNTING METHOD			
アンテナベース型式 ANTENNA BASE TYPE	直型アンテナベース RIGHT ANGLE ANTENNA BASE No. 13-QA330	L型アンテナベース L-TYPE ANTENNA BASE No. 13-QA310	
コード番号 CODE No.	000-803-239	000-803-240	

アンテナベース基部
MOUNTING DIMENSIONS OF ANTENNA BASE



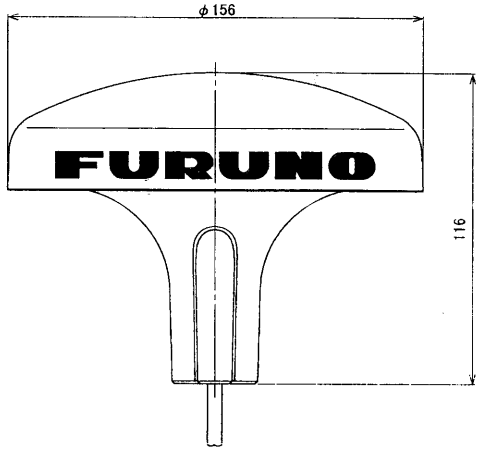
取付場所 MOUNTING LOCATION

THE FIGURE BELOW SHOWS THE RECOMMENDED SEPARATION DISTANCES FROM OTHER ANTENNAS TO AVOID MUTUAL INTERFERENCE.
他の機器のアンテナから下の図の距離以上離す。



*支柱の太さにより変わる。
* DISTANCE DEPENDS ON MAST DIAMETER OF 'a'.

aの直径 DIA. OF 'a'	確保する距離 DISTANCE (MIN.)
10 cm	1.5 m
30 cm	3 m

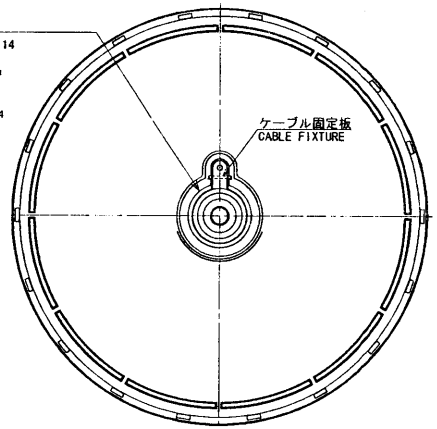


寸法区分(mm) DIMENSION	公差(mm) TOL.
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

表 1　TABLE 1

1-14UNS1B
ねじ山数(25.4mmにつき)：14
ピッチ：1.8143 mm
オネジ有効長さ：15.17 mm
オネジ有効径：24.17 mm

THREAD PER 25.4mm (1 INCH): 14
PITCH: 1.8143 mm
THREAD LENGTH: 15.17 mm
PITCH DIAMETER: 24.17 mm



注記：　指定外の寸法公差は表1による

NOTE: TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.

型式 TYPE	ケーブル長(m) CABLE LENGTH	プラグ PLAG	質量 (kg) MASS
GPA-019	10	TNC-P-3	1.0
GPA-019S	0.2	TNC-J-3	0.54

表 2　TABLE 2

DRAWN	Jun 17'99 T.YAMADA	TITLE	GPA-019/019S
CHECKED	Jun 17'99 K.Furuuchi	名称	空中線部
APPROVED	Jun 17'99 K.Furuuchi		外寸図
SCALE	1/2	NAME	ANTENNA UNIT
MASS	TABLE 2 表2参照		OUTLINE DRAWING
DWG. No.	C4400-G01- D		

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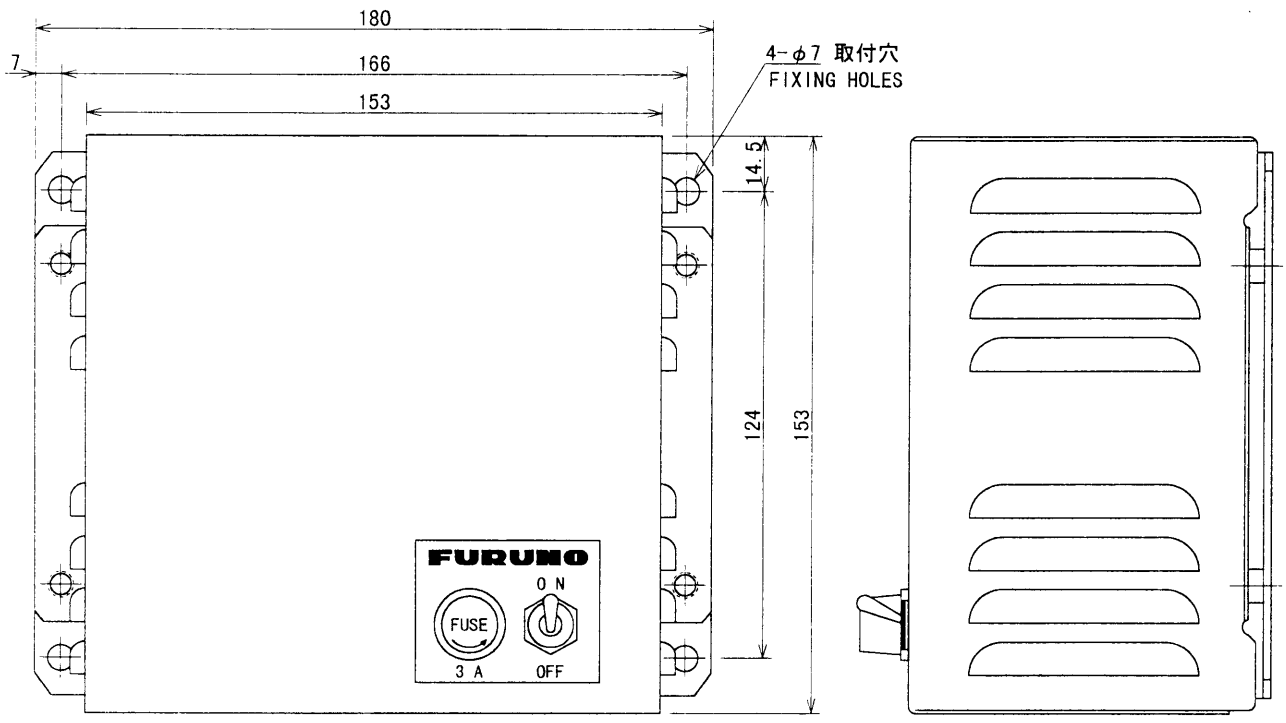


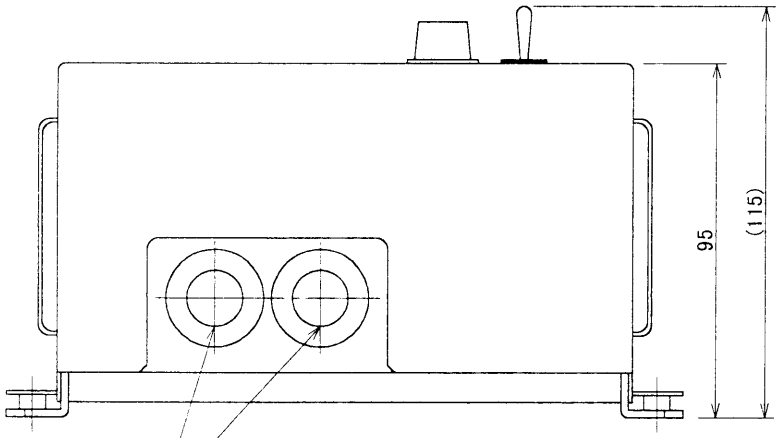
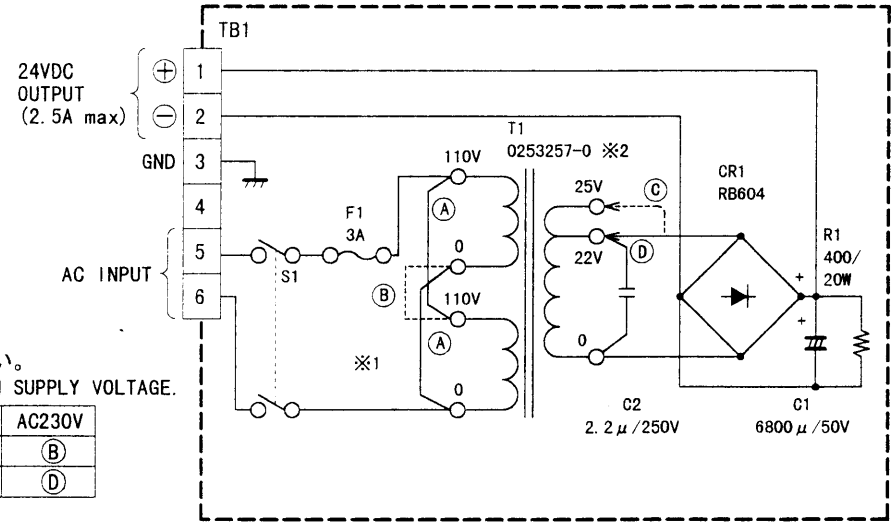


表1　TABLE 1

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



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	AC110V	AC220V	AC230V
※1	Ⓐ	Ⓐ	Ⓑ	Ⓑ
※2	Ⓒ	Ⓓ	Ⓓ	Ⓓ

DRAWN July 4 '00 T. YAMASAKI		TITLE	PR-62
CHECKED July 5 '00		名称	整流器
APPROVED July 5 '00			外寸図
SCALE 1/2	MASS 3 kg ±10%	NAME	RECTIFIER
DWG. No. C5003-034- D			OUTLINE DRAWING

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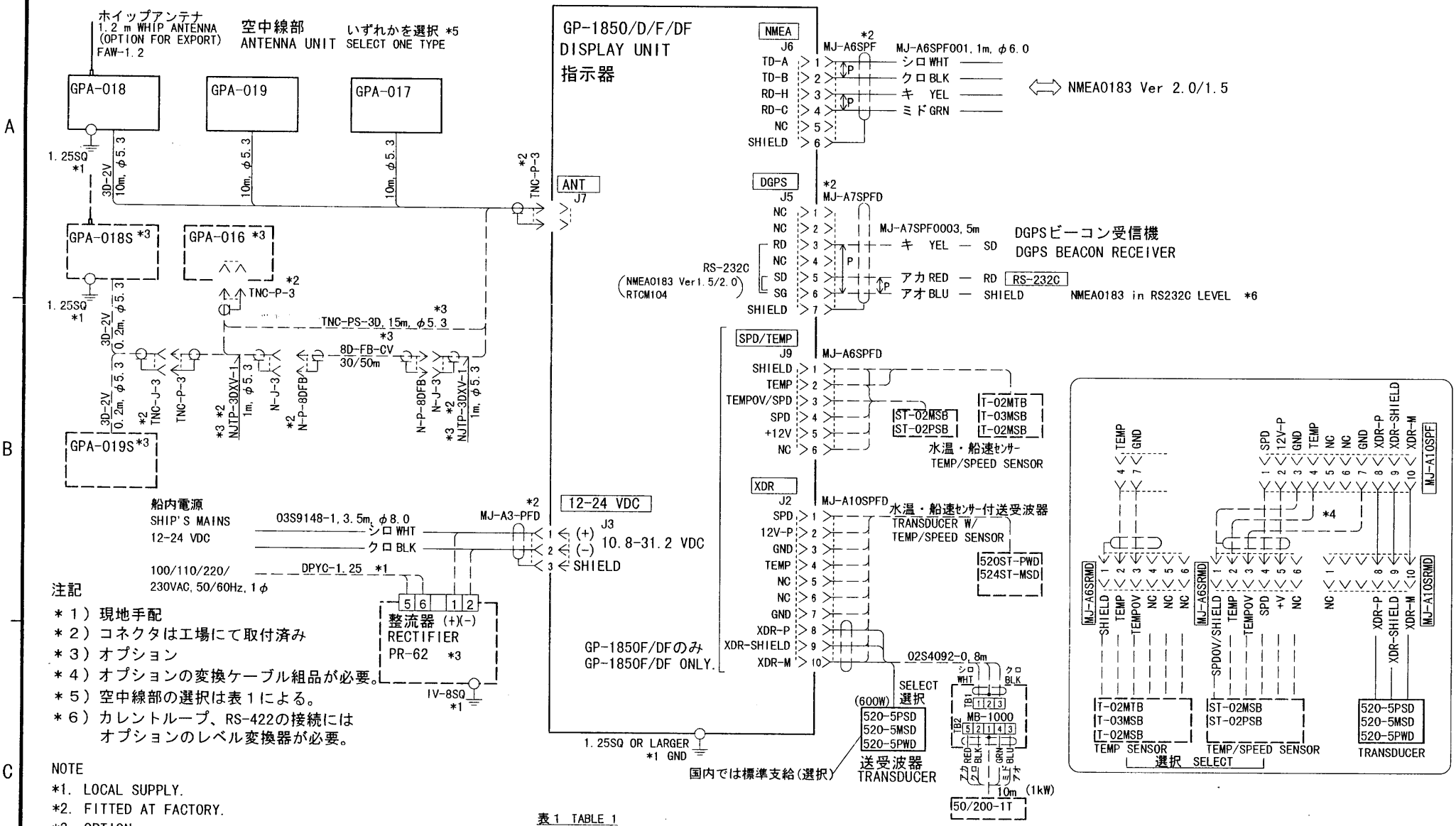

注記

*1）現地手配
*2）コネクタは工場にて取付済み
*3）オプション
*4）オプションの変換ケーブル組品が必要。
*5）空中線部の選択は表1による。
*6）カレントループ、RS-422の接続には
　　オプションのレベル変換器が必要。

NOTE

*1. LOCAL SUPPLY.
*2. FITTED AT FACTORY.
*3. OPTION
*4. THREE-WAY CONVERSION CABLE NEEDED (OPTION).
*5. REFER TO TABLE 1 FOR ANTENNA UNIT SELECTION.
*6. OPTIONAL LEVEL CONVERTER REQUIRED FOR
　　CURRENT LOOP OR RS422 OUTPUT.

表1 TABLE 1

型式 TYPE	空中線部 ANTENNA UNIT
GP-1850/F	GPA-017 GPA-016
GP-1850D/DF	GPA-018/018S GPA-019/019S

DRAWN	June 10'99 T.YAMASAKI	TITLE	GP-1850/D/F/DF
CHECKED	June 10'99 K.Kusunoki	名称	GPSプロッタ／GPSプロッタ魚探
APPROVED	June 10'99 K.Kusunoki		相互結線図
SCALE	MASS kg	NAME	GPS PLOTTER, GPS PLOTTER/SOUNDER
DWG. No.	C4395-C01- H		INTERCONNECTION DIAGRAM

S-1-1

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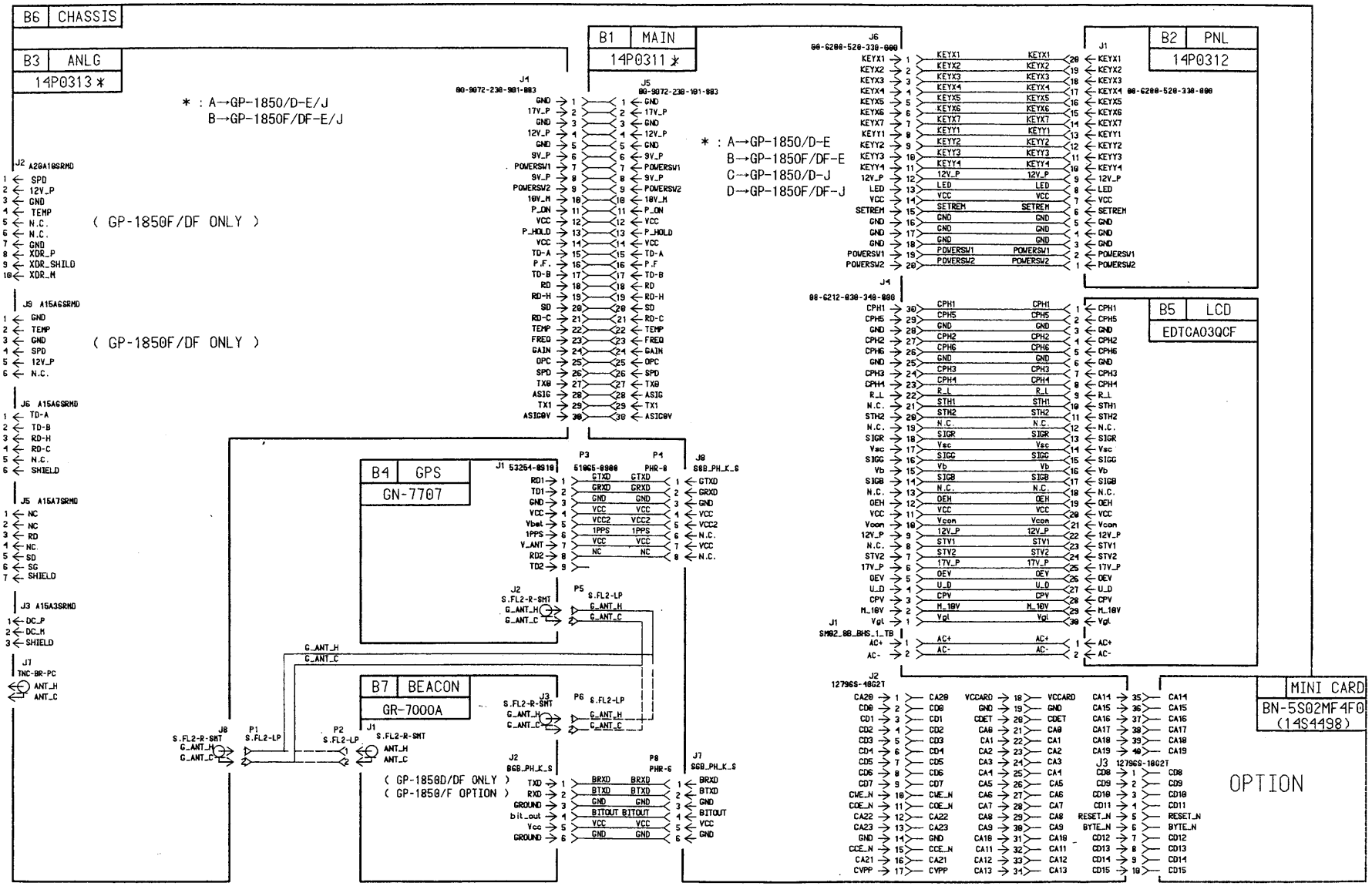

DRAWN Dec22'99 T.TANASAKA			TYPE GP-1850/D/F/DF
CHECKED Dec22'99 K.Kusumoto	GP-1850DF GP-1850F GP-1850/D		名称 指示器（総合） 回路図
APPROVED Dec22'99 K.Kusumoto			
SCALE / MASS kg	APPLICABLE TO; (MODEL)	BLOCK NO.	NAME DISPLAY UNIT(GENARAL)
DWG NO. C4395-K01- D	14-063-0001- 3		SCHEMATIC DIAGRAM

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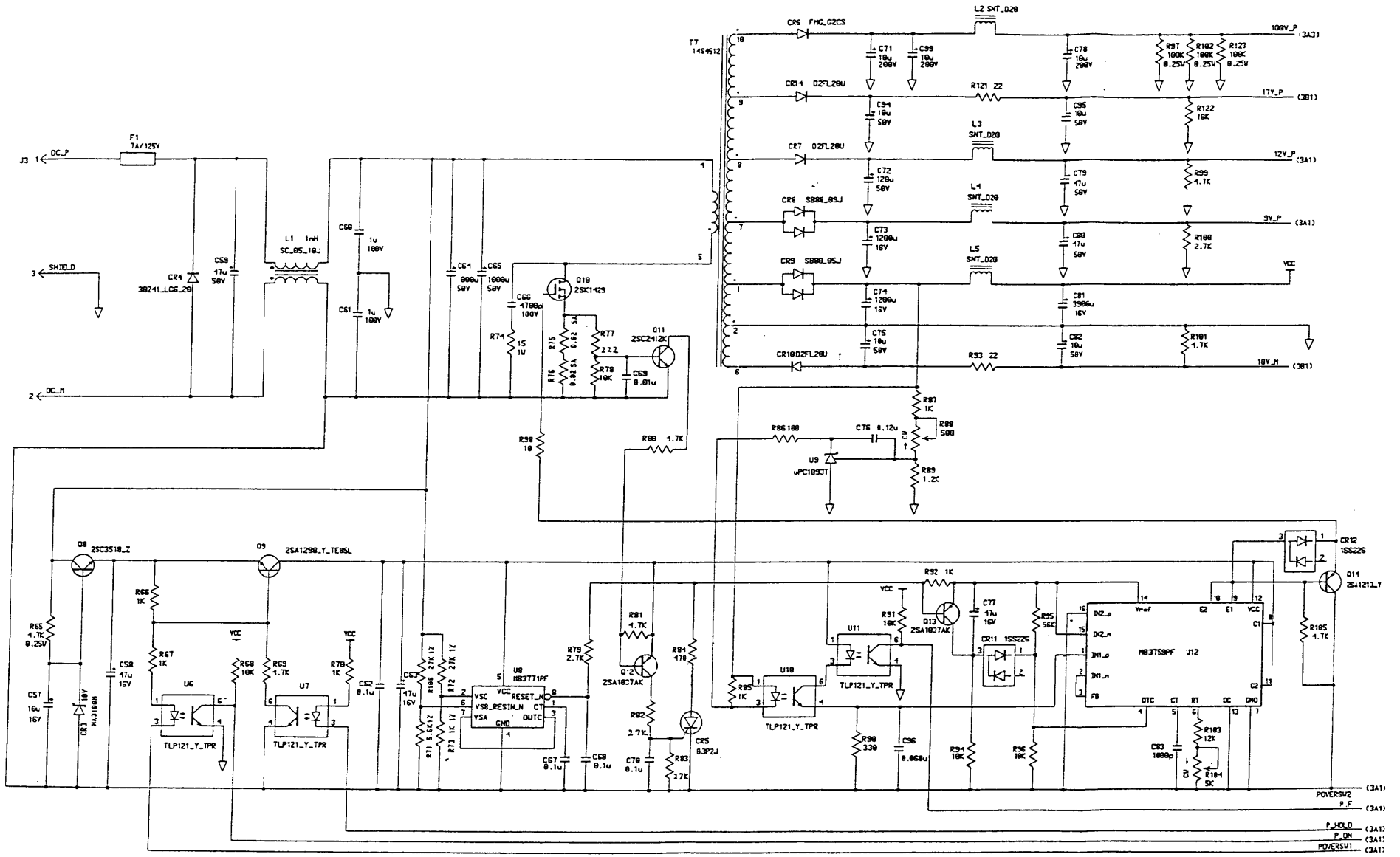

DRAWN Dec17'98 T.TAMASAKI			TYPE	14P0313
CHECKED Dec17'98 K.KISHIMOTO			名称	アナログ基板 (2/3)
APPROVED Dec17'98 K.KISHIMOTO	GP1850SER			回路図
SCALE /	MASS kg	APPLICABLE TO; (MODEL)	BLOCK NO.	NAME ANLG PCB(2/3)
DWG NO. C4395-K03- A	14-063-0004- 1			SCHEMATIC DIAGRAM

FURUNO ELECTRIC CO., LTD