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FURUNO

OPERATOR'S MANUAL

DIGITAL DEPTH INDICATOR

MODEL ED-222

FURUNO ELECTRIC CO., LTD.
NISHINOMIYA, JAPAN

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·Your Local Agent/Dealer

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⚠ SAFETY INSTRUCTIONS

"**DANGER**", "**WARNING**" and "**CAUTION**" notices appear throughout this manual. It is the responsibility of the operator and the installer of the equipment to read, understand and follow these notices. If you have any questions regarding these safety instructions, please contact a FURUNO agent or dealer.

The level of risk appearing in the notices is defined as follows:

⚠ **DANGER**	This notice indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury.
⚠ **WARNING**	This notice indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ **CAUTION**	This notice indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury, or property damage.

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Safety Instructions for the Operator

⚠ WARNING



Do not open the equipment.

Hazardous voltage which can cause electrical shock, burn or serious injury exists inside the equipment. Only qualified personnel should work inside the equipment.

Do not disassemble or modify the equipment.

Fire, electrical shock or serious injury can result.

Turn off the power immediately if water leaks into the equipment or the equipment is emitting smoke or fire.

Continued use of the equipment can cause fire or electrical shock.

Do not place liquid-filled containers on the top of the equipment.

Fire or electrical shock can result if a liquid spills into the equipment.

Do not operate the equipment with wet hands.

Electrical shock can result.

Keep heater away from equipment.

Heat can alter equipment shape and melt the power cord, which can cause fire or electrical shock.

⚠ CAUTION

Use the proper fuse.

Use of a wrong fuse can result in fire or permanent equipment damage.

Do not use the equipment for other than its intended purpose.

Personal injury can result if the equipment is used as a chair or stepping stool, for example.

Do not place objects on the top of the equipment.

The equipment can overheat or personal injury can result if the object falls.

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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.

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1. FOREWORD

Congratulations on your choice of the FURUNO ED-222 Digital Depth Indicator! We are confident that you will enjoy many years of operation with this fine piece of equipment.

For over 40 years FURUNO Electric Company has enjoyed an enviable reputation for quality and reliability throughout the world. This dedication to excellence is furthered by our extensive global network of agents and dealers.

The ED-222 is the newest addition to FURUNO's Navigational and Color Video Sounders family. This new indicator repeats at a distance the depth indication of the connected Navigational Echo Sounder or Color Video Sounder. It's light-weight and compact size make it suitable for most oil vessels.

We would appreciate feedback from you, the end-user, about whether we are achieving our purposes.
Thank you for considering and purchasing FURUNO equipment.

FEATURES

- Compact cabinet can be mounted on a table top or in an instrument panel.
- Clear 3-digit readouts with 0.1 resolution in meters, fathoms or feet.
- Automatic Range switch covering 0 to 999 (meters, fathoms or feet).
- Audible and visual alarms for preset alarm and gate depth.
- Depth and alarm data output in FURUNO CIF or NMEA0183.

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2. SYSTEM CONFIGURATION

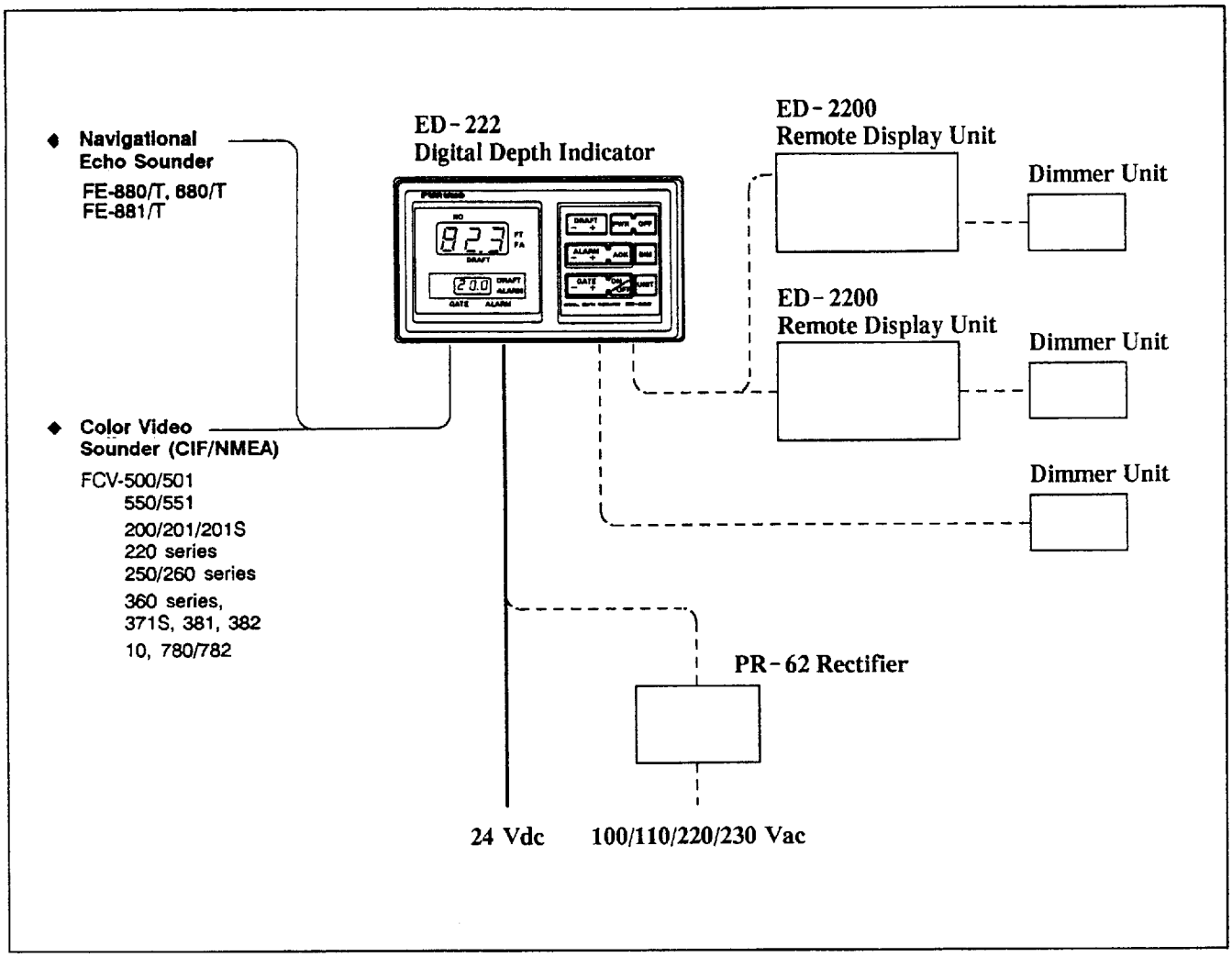


Fig. 2.1 System Configuration

Notes:

1) ED-222 supplies power to remote display unit ED-2200 (max two units).
2) ED-2200's alarm depth and dimmer controls operate independently of those on the ED-222.
3) Interface board 02P5691(option) is required for the following conditions.

If ED-222 is connected with ...	And the length of a connection cable is ...	Then the interface board 02P5691 is
FE-880/T FE-881/T FE-881 MARK-2 FE-680/T	more than 10m	required.
	less than 10m	not required.
	any length	not required.

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3. DESCRIPTION OF CONTROLS

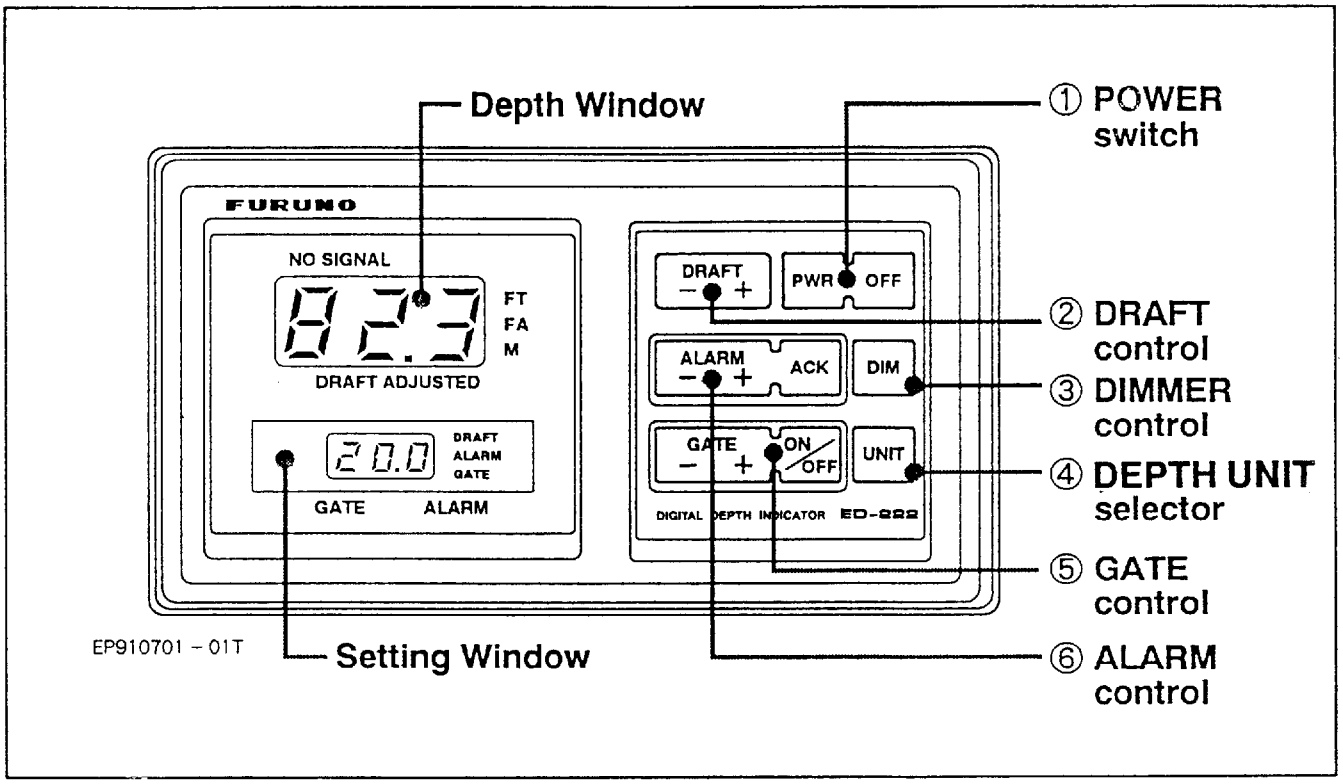


Fig. 3.1 Control Panel

① Power switch

The POWER switch turns the equipment on and off.
Press **PWR** to turn on the equipment.
Press **PWR** and **OFF** simultaneously to turn off the equipment.

TIP! The combined echo sounder can turn on/off the ED-222 simultaneously. Connect the remote ON/OFF line referring to the Interconnection Diagram. In this case, the function of **PWR** and **OFF** keys is disabled.

② DRAFT control

Sets ship's draft when you require the depth indication from the sea surface rather than the transducer. Press **DRAFT [+]** or **[–]** key to set draft. ("DRAFT ADJUSTED" lights in the display window when these keys are pressed.)

⚠ CAUTION

We recommend setting the draft to zero so that the display reads a depth of seabed below the transducer.

TIP! 1) The depth indication of the ED-222 is not affected by the draft control of a navigational echo sounder.

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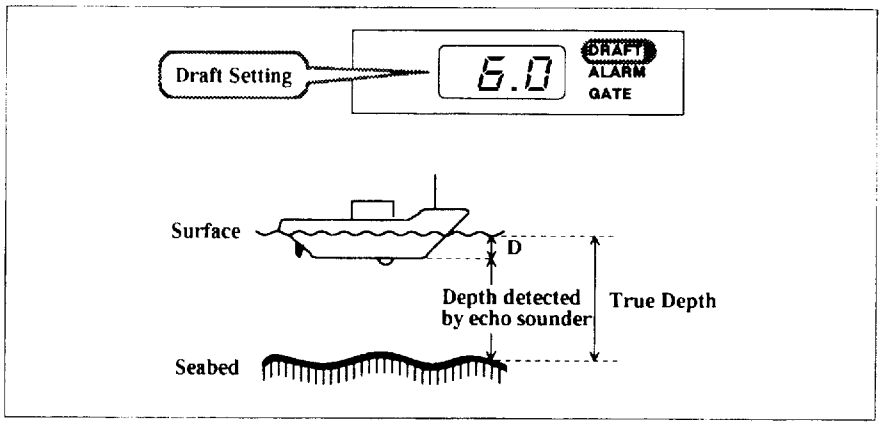


Fig. 3.2

③ Dimmer Control

The **DIM** key adjusts the brilliance of the keyboard and display in the following sequence.

DIM ⟶ Bright

⟶ d-1 ⟶ d-2 ⟶ d-3 ⟶ ... ⟶ d-8 ⟶

TIP! The DIMMER unit controls the brilliance of ED-222, if connected. In this case, **DIM** key function is disabled.

④ Depth Unit Selector

The **UNIT** key selects the depth unit. To change the current unit, press the key until desired unit lights.

⟶ M (meter) ⟶ FT (feet) ⟶ FA (fathom) ⟶

UNIT (once): Current unit blinks.
UNIT UNIT ... : New unit is indicated.

⑤ Gate Control

When a dense DSL (Plankton layer) or a large fish school is between surface and seabed, the depth to the DSL or large fish school may be shown. The gate control is used to restore the true depth indication in such case.The Gate control functions only when the navigational echo sounder is combined. The connection of the color video sounder disables this function.

GATE Depth setting

1. Press **GATE[+]** or **[-]** to set the gate depth. The echoes within the gate depth is ignored.

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TIP! The gate depth is always set from the ship's hull (transducer position) irrespective of DRAFT settings.

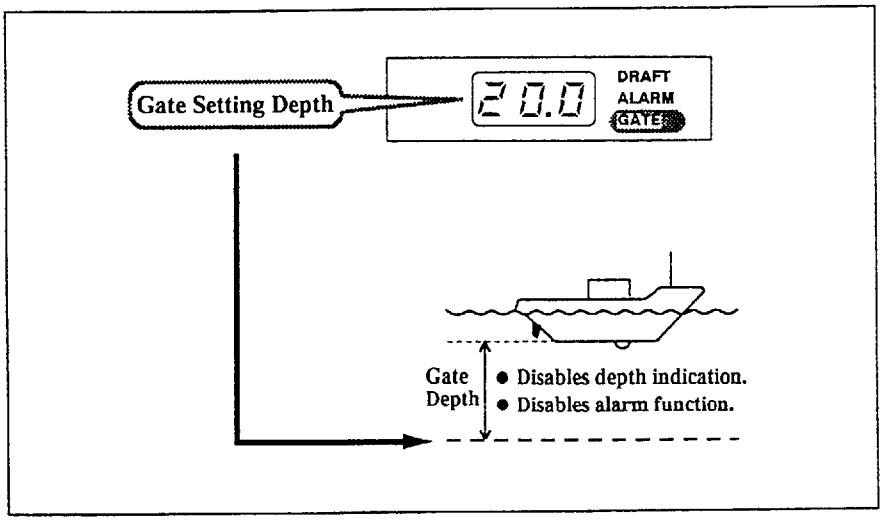


Fig. 3.3 Gate depth setting

Gate ON/OFF

Press **ON/OFF** key to activate the gate function and "GATE" lights. The operation terminates automatically in three minutes. You can also turn off the gate function by pressing the **ON/OFF** key.

TIP! If you turn on the gate function, the echoes within the gate depth are ignored. In the figure below, for example, seabed echo is interrupted by aeration in area (a) and depth to the fish school is displayed in area (b). Seabed detection restores in area (c) where the gate function is turned on and the fish echo is ignored.

Note that there is no depth indication nor audible alarm in area (e) since the seabed is present within the gate depth. The gate depth should be set to exclude the seabed or a high concentration of fish school.

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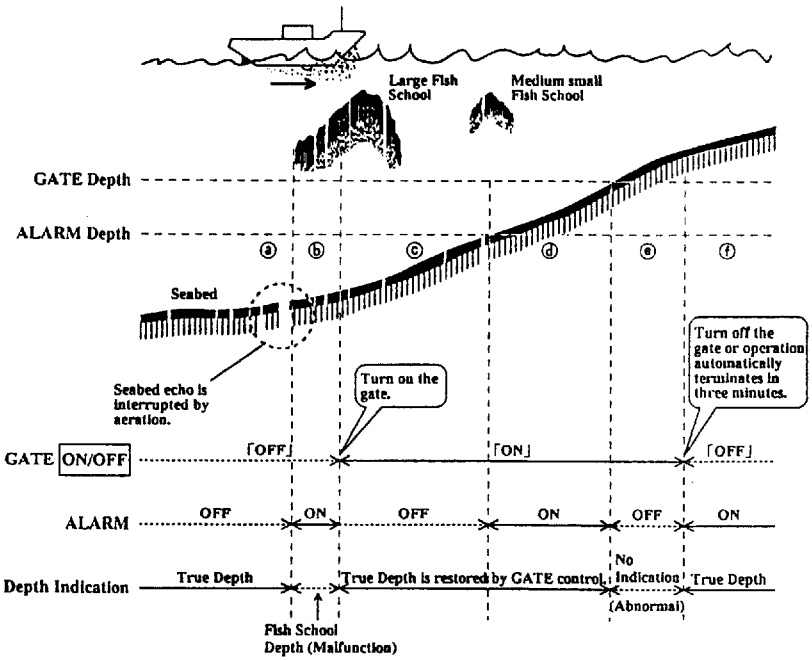


Fig. 3.4 Gate Function

⑥ ALARM

The alarm sounds when the ship enters into the specified depth (shallow alarm mode) only if the switch S1/#3 is set to OFF (See pages 16 and 17.). In waters where the depth is known to dramatically and suddenly rise without warning, it may be a good idea to turn on the depth alarm.

Alarm zone setting

1. Press **ALARM [+]** or **[–]** to set the alarm zone.
   The alarm will sound if the ship enters waters shallower than the preset depth. Note that the alarm zone is set by the depth from the transducer irrespective of the DRAFT seeting.

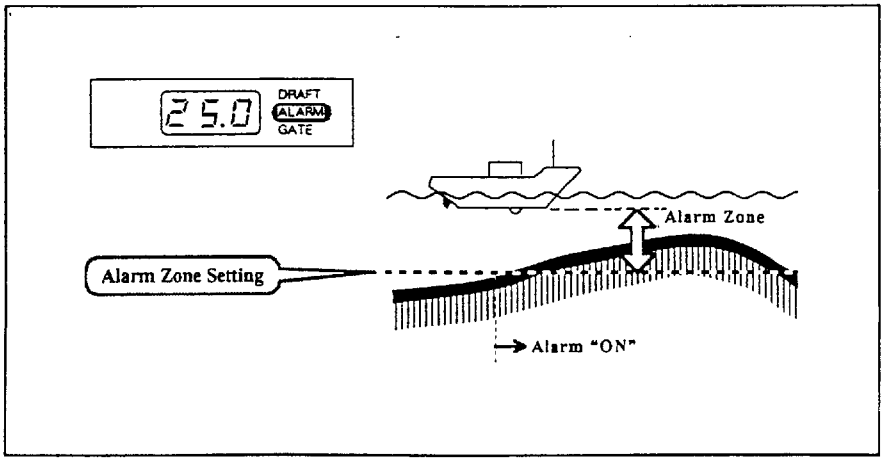


Fig. 3.5 Alarm zone setting

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Alarm OFF

Press **ACK** key to cease the audible alarm.

TIP! The alarm restores itself automatically when the depth goes deeper than the preset depth and again goes shallower than the preset depth.
To restore it manually, turn off the equipment and turn it on again.

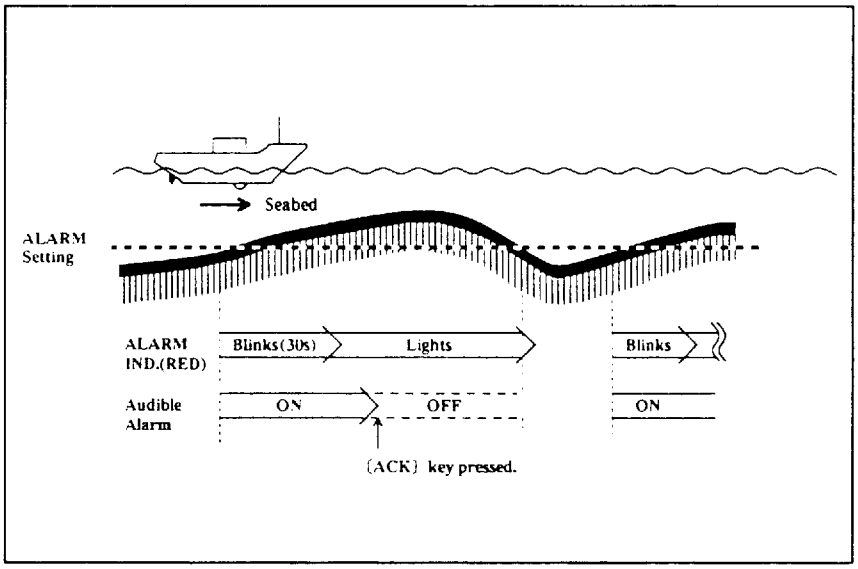


Fig. 3.6 Alarm Operation

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4. READING THE DISPLAY WINDOW

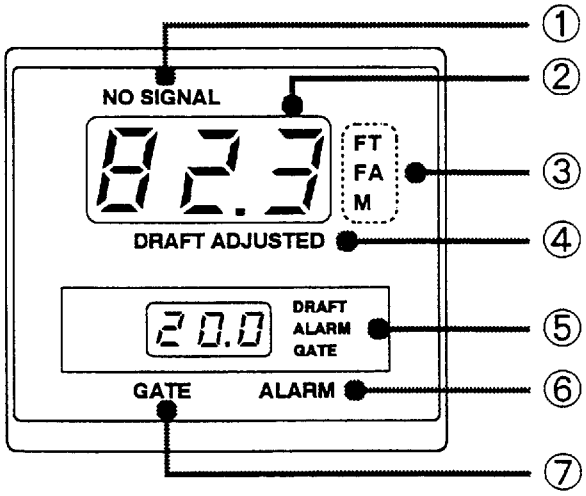


Fig.4.1 Display Window

	Display Item	Descriptions
1	**NO SIGNAL**	"NO SIGNAL" blinks when the echo signal is interrupted. If there is no signal for 30 seconds, the depth indication disappears and "NO SIGNAL" lights. No alarm sounds.
2	**Depth**	The seabed depth. Depths appear in increments of 0.1; above 100 in 1 unit steps. (In case of FT; i unit steps)
3	**Depth Unit**	The depth unit selected by the **UNIT** key lights.
4	**DRAFT ADJUSTED**	This indication lights to show that draft has been adjusted.
5	**Setting Window**	This window displays DRAFT, ALARM or GATE setting when changing these settings. Also, one of the three indications to the right of setting lights. The default indication is alarm depth.
6	**ALARM (RED)**	When the ship enters waters shallower than the preset depth, "ALARM" blinks and the buzzer sounds only if the switch S1/#3 is set to OFF (See pages 16 and 17.). The indication "ALARM" lights continuously after initial 30 seconds.
7	**GATE (RED)**	"GATE" lights when the gate function is turned on.

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5. OPERATING PROCEDURE

1 Adjust the GAIN control of the combined navigational echo sounder (or color video sounder) to obtain a clear and steady seabed echo.
Adjust STC and TVG if required.

2 If the combined navigation echo sounder has white line or grey line, turn them off.

3 Turn the ED-222 on and the depth appears.

4 Adjust the brilliance by the **DIM** key if necessary.

5 Adjust the DRAFT depth if necessary. If the draft is already set, "DRAFT ADJUSTED" is lighting. Press **DRAFT** key once and confirm the current draft setting.

6 Adjust the ALARM and the GATE depth if necessary. Note that the GATE should be set shallower than the ALARM depth.

TIP! The control panel settings are backed up by the memory; the equipment starts with the last settings when you turn the power on.

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6. ERRONEOUS DEPTH INDICATION

⚠ CAUTION

Note that the followings may cause erroneous depth indication.

JUST AFTER TURNING THE POWER ON (Within 1 minute)

When a dense DSL (plankton layer) or a large fish school is between surface and seabed, the depth to the DSL or large fish school may be shown. To get the depth to the seabed do one of the following.

1) Reduce the gain setting of the combined navigational echo sounder to obtain a steady seabed echo only. Confirm that the depth indicates the true seabed, then restore the previous gain setting.
2) Set the GATE depth deeper than the DSL or large fish school. Press **ON/OFF** key to turn on the gate function. Confirm that the depth indicates the true seabed then press **ON/OFF** key again to terminate the gate function.

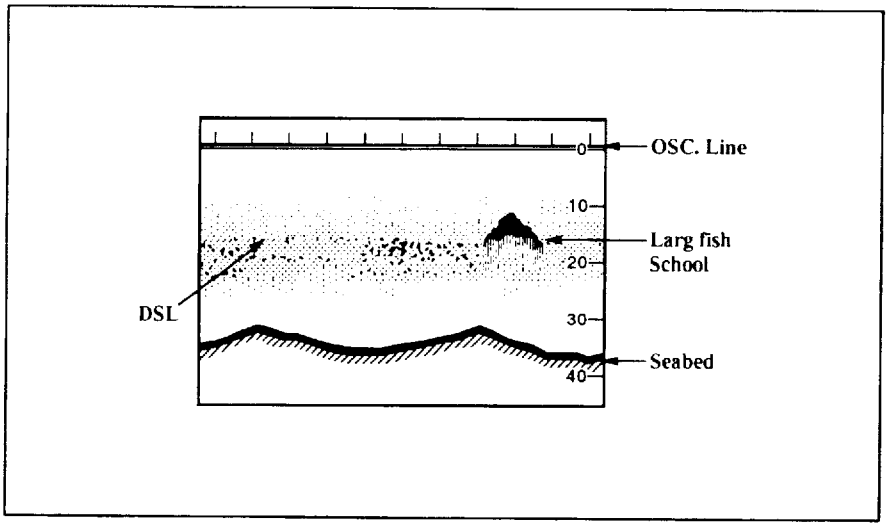


Fig. 6.1 DSL/Large fish school

LARGE FISH SCHOOL

When a large fish school comes below the own ship, the depth sometimes does not indicate the seabed but the fish school. This phenomenon tends to occur in rough seas.

Follow the procedure in the paragraph "JUST AFTER TURNING THE POWER ON" to solve this problem.

SECOND REFLECTION ECHO

The depth reading is taken from the second reflection echo.

(For example, the first reflection echo enters the gate control zone in shallow waters.)
The indication is almost twice as deep as true seabed.

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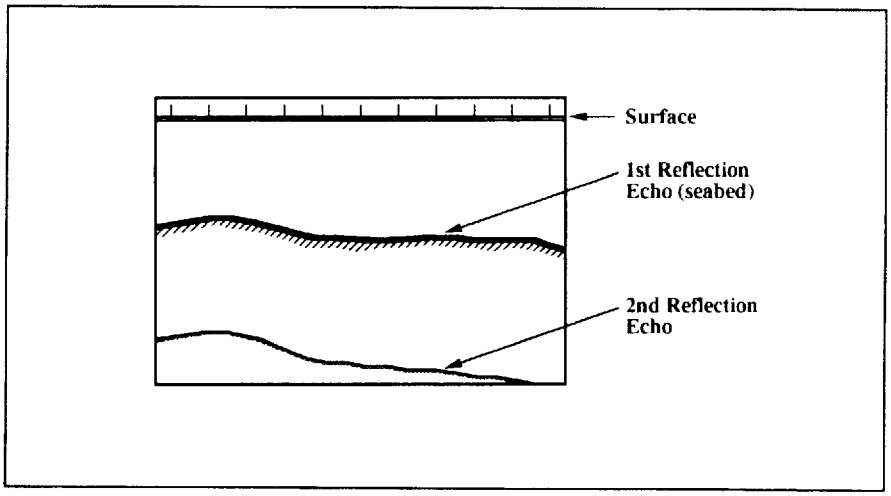


Fig. 6.2

The indication can be corrected by one of two ways:

1) Reduce the gain setting of the combined navigational echo sounder to obtain the first reflection echo only. Confirm that the indication is corrected then to restore the previous gain setting.
2) Turn off the equipment and turn it on again. (If the seabed is deeper than the gate control depth.)

HEAVY SURFACE NOISE

Erroneous depth indication due to heavy surface noise may occur though the combined navigational echo sounder plots a clear and steady seabed.

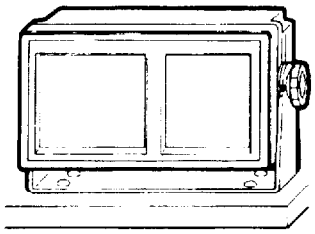
1) Readjust the GATE control depth to half of the seabed. Press **ON/OFF** key to activate the gate function. Confirm that the indication shows the correct depth then turn off the gate function.

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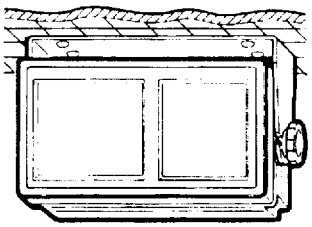
7. INSTALLATION

MOUNTING SITE

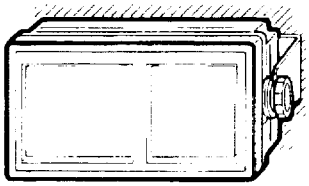
The ED-222 may be mounted in the following methods.



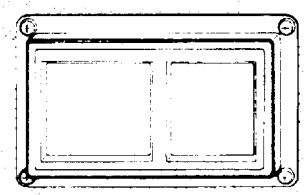
(a) Tabletop Mount



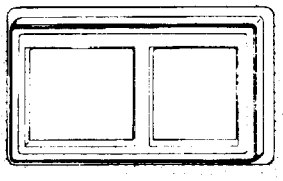
(b) Overhead Mount



(c) Bulkhead Mount



(d) Flush Mount (F-type)



(e) Flush Mount (S-type)

Fig. 7.1

Necessary Considerations

* A dry and well-ventilated place.
* A less vibrated place.
* A shaded place from direct sunlight.
* A place not exposed to rain or water-splash.

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MOUNTING METHOD

Tabletop, Overhead and Bulkhead

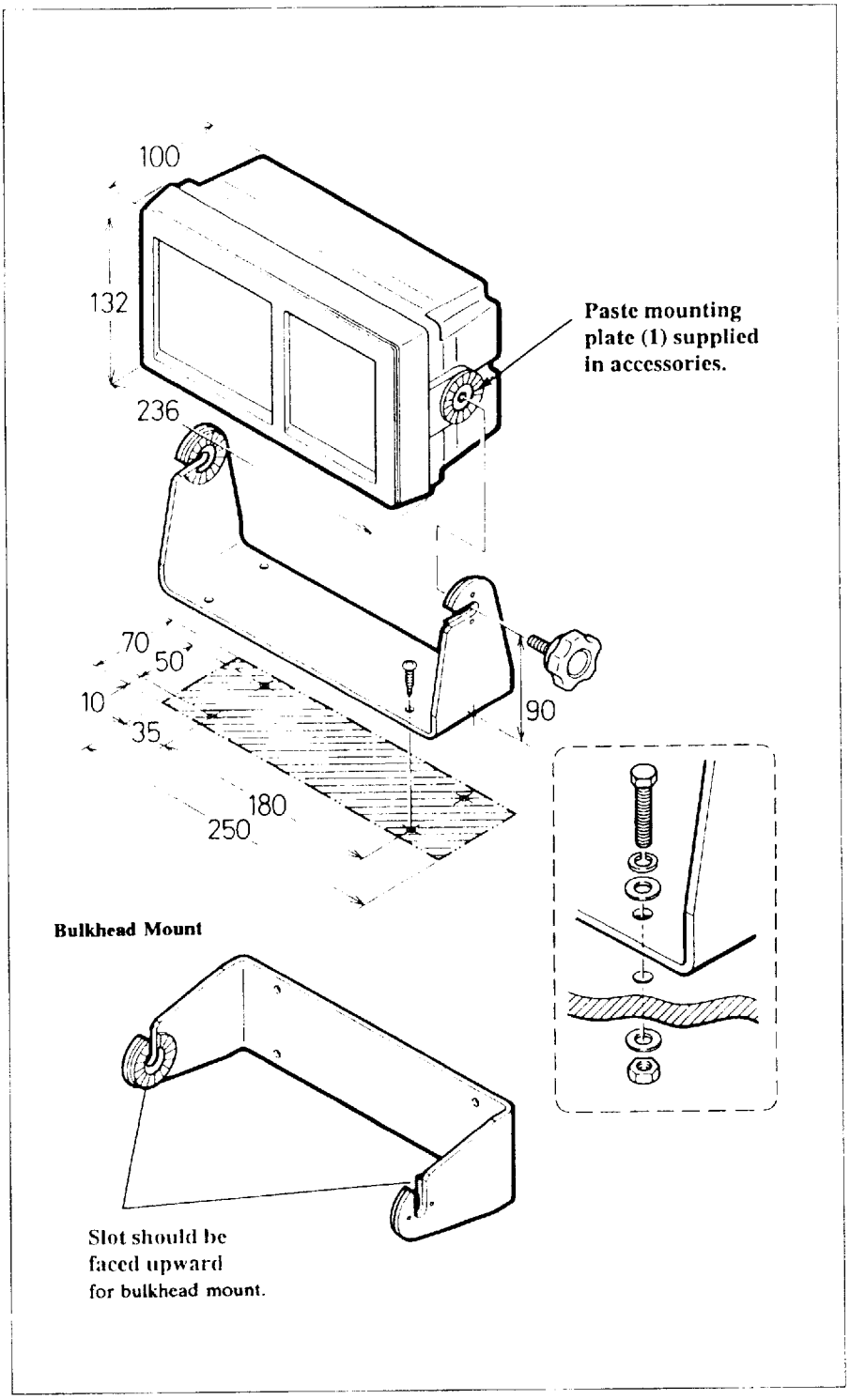


Fig.7.2

Remarks:
1) Unit in mm.
2) Use bolts and nuts if the base plate is thin as shown in figure surrounded by broken lines.
3) Allow the service space at both sides and the rear of the unit.

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FLUSH MOUNT (S-TYPE)

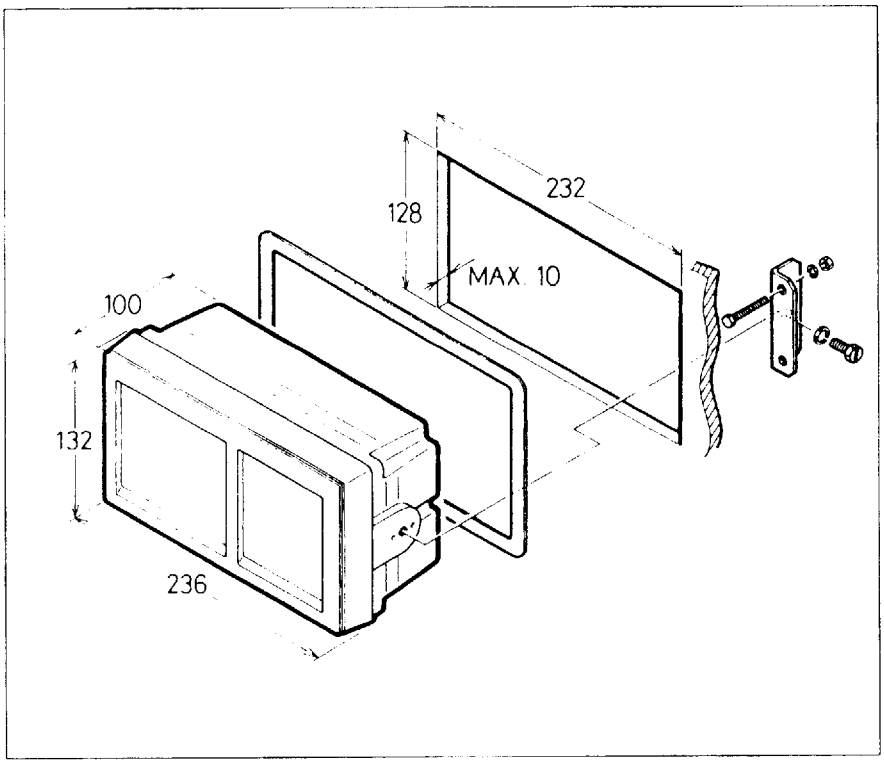


Fig. 7.3

FLUSH MOUNT (F-TYPE)

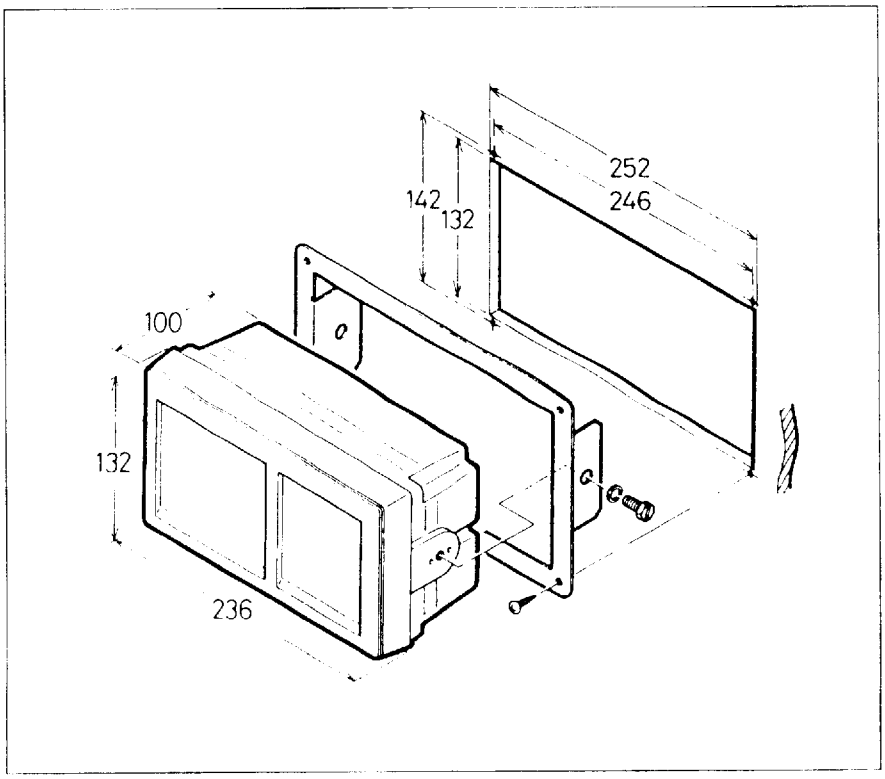


Fig. 7.4

Remarks: 1) Unit in mm.

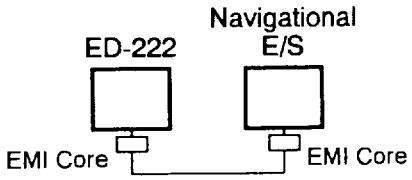
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CABLE CONNECTION

⚠ CAUTION

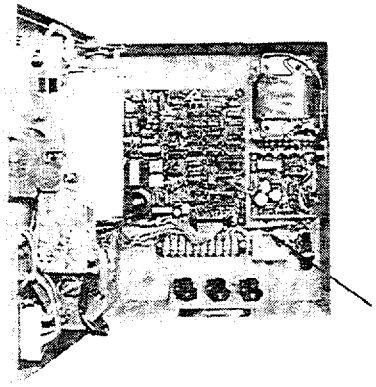
To comply with EMC reguirement specified by IEC945, mount the EMI cores supplied as close as both ends of the interconnection cable.

Cable connections to the ED-222 indicator unit are made at the connectors located at the rear of the unit. Refer to the interconnection diagrams on pages S-1, S-2 and S-3.

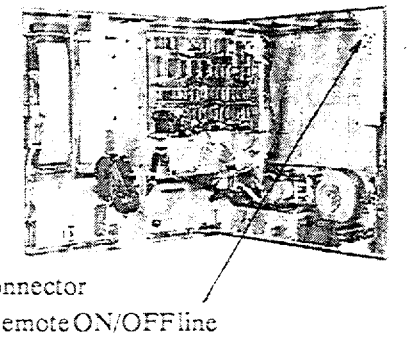


Combined Equipment	Interconnection Diagram	Page
Navigational E/S	C2333-C01	S-1
Echo Sounders and Color Video Sounders	C2333-C02	S-2
Remote Display ED-2200	C2333-C03	S-3

A 2P connector for "remote on/off" line locates at the following position.



FE-680/T



FE-880/T and 881

POWER CABLE CONNECTION

The ED-222 is designed to operate normally at any voltage between 10 and 40 Vdc.
Use the rectifier unit PR-62 (optional supply) when the power is taken from 100/110/220/230 Vac.

GROUNDING

Grounding should be made from the ground terminal using the copper plate.
As the ED-222 produces pulse signals, poor grounding may cause interference to the direction finder, radiotelephone receiver (especially 27 MHz band).

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Check after Installation

After the complete installation, check the items below to ensure the correct and reliable operation according to to your system configuration.

(1) DIP switch settings
(2) Data format selection (CIF-IEC1162/NMEA)
(3) Minus Draft Adjustment
(4) Display window test
(5) GAIN Adjustment
(6) Stabilizing Depth Reading in Adverse Weather
(7) Remarks for Changing Depth Unit

DIP sw Setting

Refer to Fig. 7.5 for the location of S1/S2 on the MAIN board.

[S1, S2 Setting]

		Setting Items	ON	OFF
S1	#1	KP Polarity	Negative	Positive
	#2	Draft Control	Able	Disable
	#3	Alarm Mode	Deep	Shallow
	#4	Input Signal	Digital	Analog
S2	#5	+5V Output (J3)	ON	OFF
	#6	+5V Output (J4)	ON	OFF

Factory-setting

[Description]

* KP Polarity — selects a positive or a negative polarity of applied keying pulse. When connecting with FE-880/T, 680/T or F-851/T, select negative.
* Draft Control — When OFF is selected, the draft control of ED-222 is disabled and DRAFT key does not function.
* Alarm Mode — selects shallow or deep alarm operation. Shallow alarm sounds the buzzer when the bottom becomes shallower than the preset depth and deep alarm sounds the buzzer when the bottom becomes deeper than the preset depth.
* Input Signal — selects the mode of depth signal, digital or analog. Select digital for color video sounder and analog for navigational echo sounder. When selecting digital, neither DRAFT nor Gate functions.
* +5VOutput — When ED-222 supplies +5V to ED-2200, select ON. Refer to Interconnection Diagram C2333-C03.

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Check after Installation

After the complete installation, check the items below to ensure the correct and reliable operation according to to your system configuration.

(1) DIP switch settings
(2) Data format selection (CIF-IEC1162/NMEA)
(3) Minus Draft Adjustment
(4) Display window test
(5) GAIN Adjustment
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DIP sw Setting

Refer to Fig. 7.5 for the location of S1/S2 on the MAIN board.

[S1, S2 Setting]

		Setting Items	ON	OFF
S1	#1	KP Polarity	Negative	Positive
	#2	Draft Control	Able	Disable
	#3	Alarm Mode	Deep	Shallow
	#4	Input Signal	Digital	Analog
S2	#5	+5V Output (J3)	ON	OFF
	#6	+5V Output (J4)	ON	OFF

Factory-setting

[Description]

* KP Polarity — selects a positive or a negative polarity of applied keying pulse. When connecting with FE-880/T, 680/T or F-851/T, select negative.
* Draft Control — When OFF is selected, the draft control of ED-222 is disabled and DRAFT key does not function.
* Alarm Mode — selects shallow or deep alarm operation. Shallow alarm sounds the buzzer when the bottom becomes shallower than the preset depth and deep alarm sounds the buzzer when the bottom becomes deeper than the preset depth.
  Note: When the ED-222 is connected to the navigational echo sounder FE-680, this setting must be OFF to sound the audible alarm when the bottom becomes shallower than the preset depth.
* Inout Signal — selects the mode of depth signal, digital or analog. Select digital for color video sounder and analog for navigational echo sounder. When selecting digital, neither DRAFT nor Gate function.
* +5V Output — When ED-222 supplies +5V to ED-2200, select ON. Refer to Interconnection Diagram C2333-C03.

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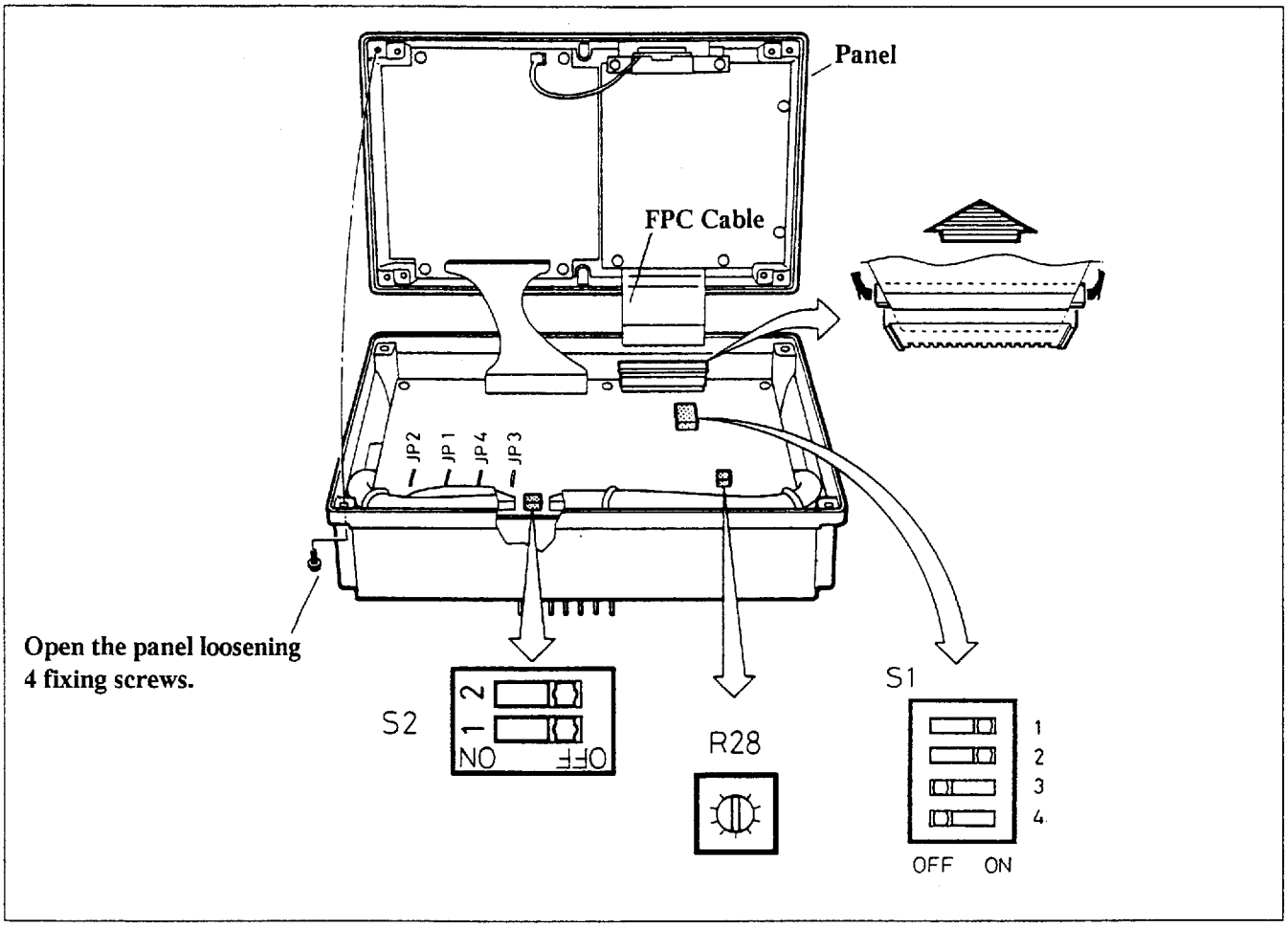


Fig.7.5

Data Format Selection (CIF-IEC1162/NMEA)

The data communication format can be selected to either CIF or IEC1162/NMEA 0183. This is done by 1) jumper wire connection on the MAIN board (hardware setting) and 2) selection on the depth window (software setting).
NOTE: CIF is only for a special case. Normally select IEC1162/NMEA.

1) Jumper Connection (JP1-4)

	NMEA	CIF
JP1 and JP3	short	open
JP2 and JP4	open	short

Factory setting

2) Selection on Depth Window
Turn on the power while pressing **ACK** key. The depth window shows the current settings of the data format. Select the same setting designated by jumper connection by **UNIT** key.

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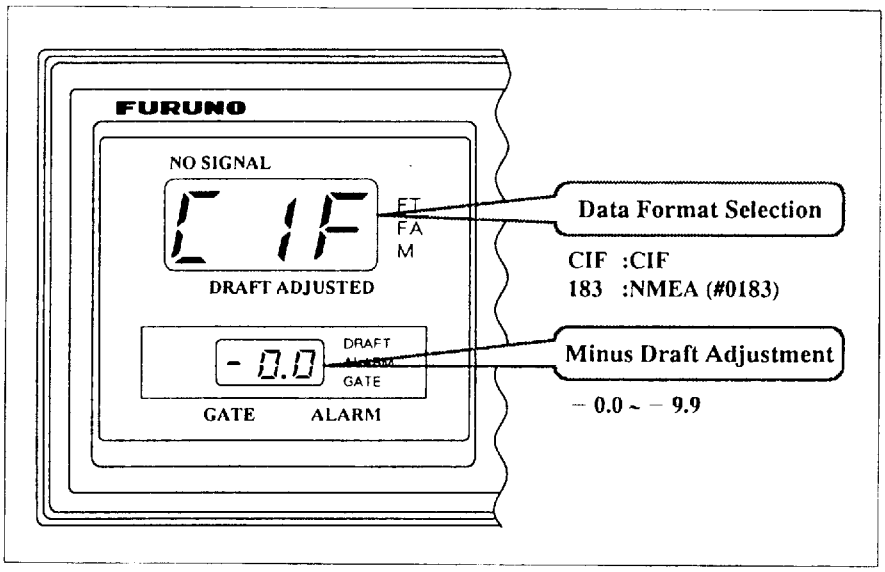


Fig. 7.6

To start with the new setting, turn off the equipment and turn on again.

Minus Draft Adjustment

This is compensation of depth error caused by the time delay of signal in the amplifier. (The indication is slightly deeper than true depth.) Correct setting is typically -0.3m.

See Fig.7.6. The minus draft setting appears on the setting window. Setting can be changed by the DRAFT key. To start with the new setting, turn off the equipment and turn on again.

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Display Window Test (LED)

Turn on the equipment while pressing **DIM** key to start the display (LED) window test. Display is checked in the following sequence.

1) All LED lamps light.
2) All LED lamps blink three times.
3) All LED lamps reduce the brightness and restore again.
4) LED lamp lights sequentially from top left to right as shown in Fig. 7.7. The numeral segments display figure of eight.

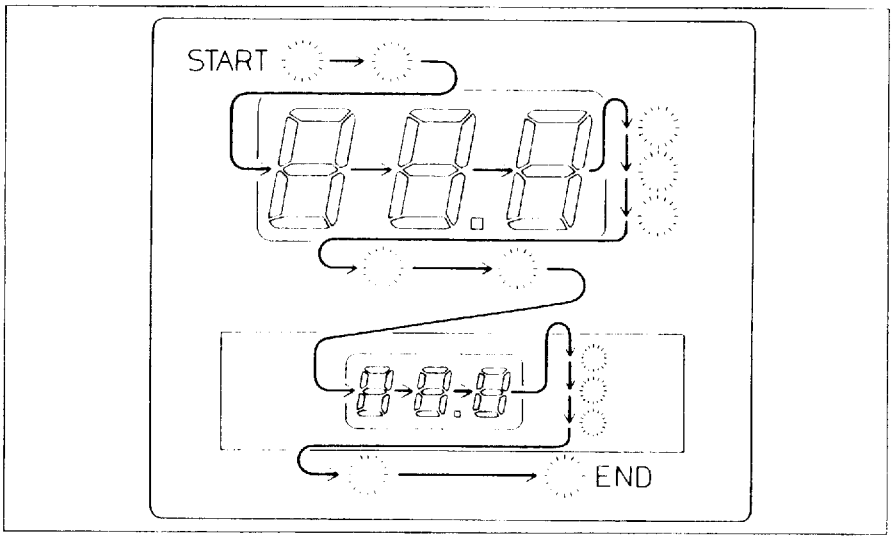
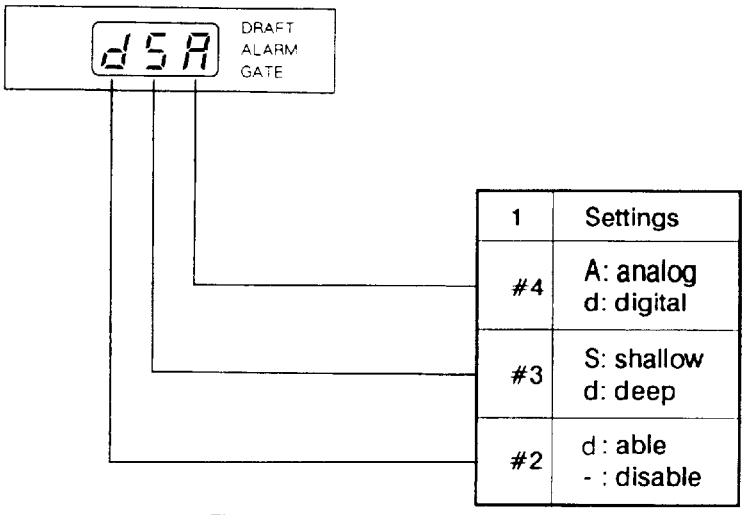


Fig. 7.7

5) All numeral segments display from "0" to "9" in succession.
6) Test terminates with showing the DIP sw S1 setting on the Setting Window. See Fig.7.9.



1	Settings
#4	A: analog d: digital
#3	S: shallow d: deep
#2	d : able - : disable

Fig. 7.8

7) To exit from the test, turn off the equipment.

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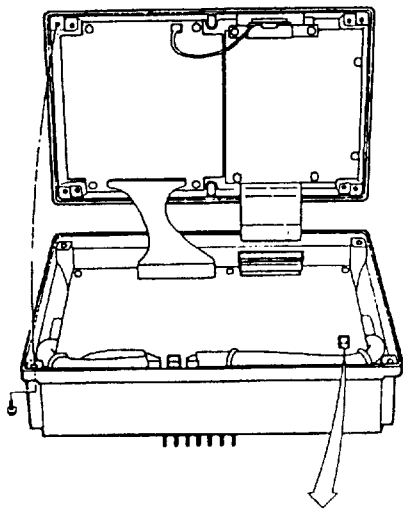
GAIN Adjustment

When the ED-222 does not display the depth though the combined echo sounder (or color video sounder) displays seabed echo clearly, the GAIN adjustment is required. Take the procedures below.

1) Check "NO SIGNAL" lamp blinks or lights on ED-222.
2) Turn off the ED-222 and turn on while pressing **UNIT** key . The setting window shows the "DEPTH" at where the output of amplifier is checked.
3) When "NO SIGNAL" lamp blinks or lights;
   a. Adjust the depth on the setting window to some target (seabed echo etc.) by **ALARM [-]** or **[+]** key, observing the combined naviga tional echo sounders (or color video sounders).
   b. Adjust the gain of the combined navigational echo sounder (or color video sounder) so that the target echo is plotted in the medium density (orange color).
   c. Depth window indicates the output of the amplifier at the selected depth in step a. The indication should be between 200 and 254. If not, adjust R28(GAIN POT) referring to the Fig. 7.5.

When the ED-222 is connected to the recorder unit of an echo sounder, bias level of echo signal changes due to characteristic variation of the I/F amplifier of the recorder unit. To offset this variation, adjust the ED-222 as follows after the installation.

1. Turn the GAIN control fully counterclockwise and set the RANGE between 50m and 100m in the recorder unit.
2 Turn the ED-222 on while pressing the UNIT key.
3. Adjust the depth on the setting window of the ED-222 to where no seabed echoes exist by ALARM [+] or [-] key. The depth window shows the amplifier output voltage.
4. Check the depth window indication. The indication should be between 1 and 10. If not, adjust R27. (When connected to some model, reading will be zero. This also does not require adjustment.)

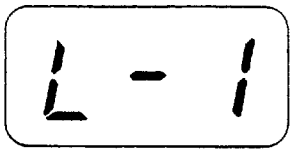


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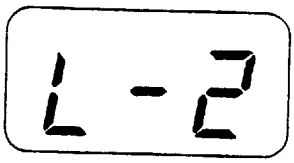
Stabilizing Depth Reading in Adverse Weather

When the depth reading often disappears due to aeration in an adverse weather, change the setting as follows, and the effect of the aeration may be reduced.

1. Turn the ED-222 on while pressing the GATE ON/OFF key. The depth window will read "L-1".



2. Press the UNIT key to change the reading to "L-2". The ED-222 is set to the operating mode for an adverse weather.



3. Turn the unit off and then on to restore normal operation.

Note

1. Since the setting is stored in the backup memory. further setting is unnecessary.
2. Use "L-1"" when strong DSL layers exist. Otherwise the ED-222 may occasionally recognize the DSL as a bottom.

Remarks for Changing Depth Unit

The ED-222 incorporates three units: "M", "FT" and "FA", and preset values (DRAFT, ALARM, GATE) set in a unit are automatically converted when the unit is changed. However since some conversion error may be introduced, check the values and re-enter if necessary.

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SPECIFICATION OF ED-222 DIGITAL DEPTH INDICATOR

The digital depth indicator ED-222 receives depth information from the echo sounder and displays steady clear digital readouts of bottom depths. It is capable of releasing alarms audibly and visually at a preset depth. Loss of signal and poor S/N condition are also alerted with the no signal indication.

1. Depth Indication

Display	3-digit LED-display
Depth Range	0-99.9, 100-999 Auto range in Feet, Meters or Fathoms
Depth Readings	True depth or relative to transducer installation position.
Resolution	0.1 (0-99.9) or 1 (100-999) in each unit
Min/Max Readouts	Subject to capability of combined echo sounder.

2. Alarms

Depth Alarm:	Alarm lamp lights and buzzer sounds when reading becomes shallower than preset depth only if the switch S1/#3 is set to OFF (See pages 16 and 17.). Preset by control panel key, 0-99 in each unit.
Signal Warning:	The signal lamp blinks and then lights if echo sounder is subject to no or poor echoes from seabed.

3. Input/Output Data

(* CIF only)

Input: Navigational E/S; KP and Echo signal
Color Video Sounder; Depth and alarm* (in IEC1162 or NMEA0183 data format)

Output: Depth and alarm* (in IEC1162 or NMEA0183 data format)

4. Environmental Conditions

Ambient Temperature	−15 to +55°C
Relative Humidity	Less than 95%
Vibration	Less than 1G (750-3000 c.p.m.)

5. Power Supply & Power Consumption

24 VDC, 10W
100/110/115/220 VAC (with optional rectifier PR-62)

6. Standard Coating Color

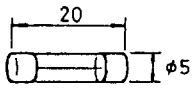
Control Panel N3.0 (not changed)
Cabinet 2.5 GY 5/1.5 New TONE #5

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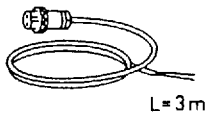
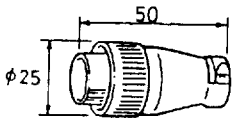
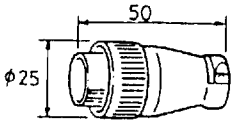
STANDARD SET

No.	Name	Type	Q'ty	Code Number
1	Digital Depth Indicator	ED-222	1	
2	Spare Parts	SP12-00600	1	000-014-272
3	Installation Materials	CP12-00900	1	000-014-273
4	Accessories	FP12-00600	1	000-014-272

SPARE PARTS (SP12-00600)

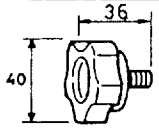
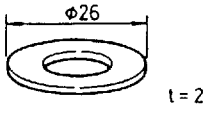
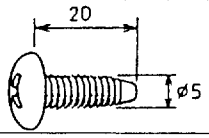
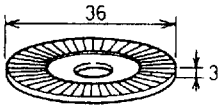
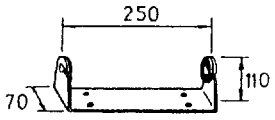
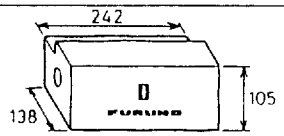
No.	Name	Outline	Type	Q'ty	Code Number
1	Fuse		FGMB, 3A 125V	3	000-104-909

INSTALLATION MATERIALS (CP12-00900)

No.	Name	Outline	Type	Q'ty	Code Number
1	Power Cable Assembly		00S0120	1	000-104-058
2	CONNECTOR		SRCN6A16-10P	2	000-508-663
3	CONNECTOR		SRCN6A16-10S	1	000-508-668
4	**EMI Core**		**044S-806402**	**2**	**000-137-942**

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ACCESSORIES (FP12-00600)

No.	Name	Outline	Type	Q'ty	Code Number
1	Knob Bolt		KG-B2 M8×20 sus	2	000-801-738
2	Knob Washer		05-029-0135-0	2	100-100-390
3	Tapping Screw		5×20 sus 304	4	000-802-081
4	Flat Washer		M5 sus 304	4	000-864-128
5	Mounting Plate		20-005-2018-0	2	100-151-840
6	Hanger Assy		FP12-00607	1	001-338-700
7	Dust Cover		20-005-2021-0	1	008-027-910

OPTIONAL SUPPLY

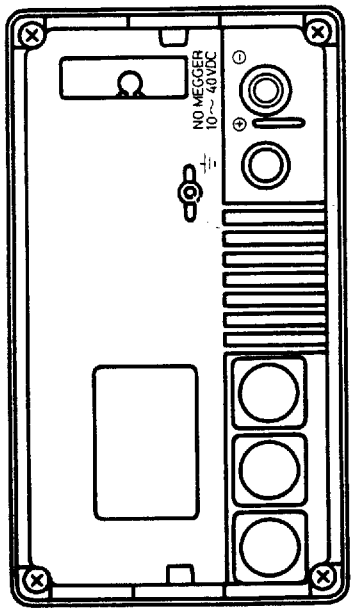
No.	Name	Type	Code Number	Remarks
1	Remote Display	ED-2200		
2	Dimmer	MF-22L-1A	000-069-405	Flush mount type
		MF-22L-2A	000-069-406	Bulkhead mount type
3	Rectifier	PR-62		
4	Flush mount F*	FP12-00610 (N-3.0) FP12-00620 (2.5G7/2) FP12-00630 (7.5BG7/2)	000-014-267 000-014-268 000-014-269	
5	Flush mount S	FP20-00610	001-337-730	
6	Interface Board	02P5691	001-323-680	
7	Junction Box	JB-6	000-044-920	For dimmer box. Refer to Note 6 of interconnection diagram on page S-1.

* Depending on the coating color of the front panel, three kinds of accessories are prepared. Specify the type when ordering.

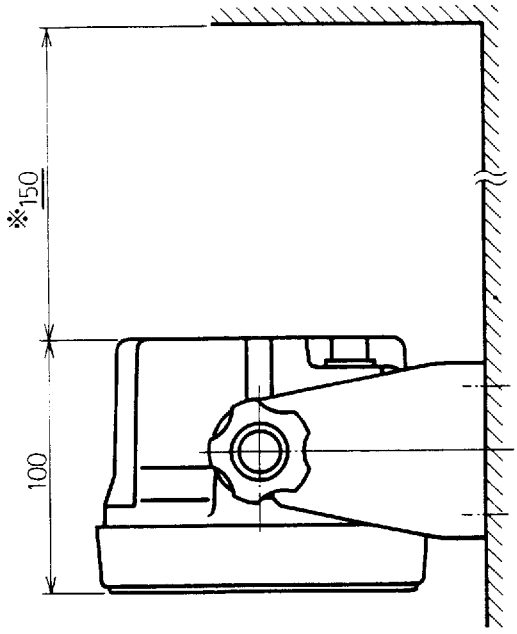
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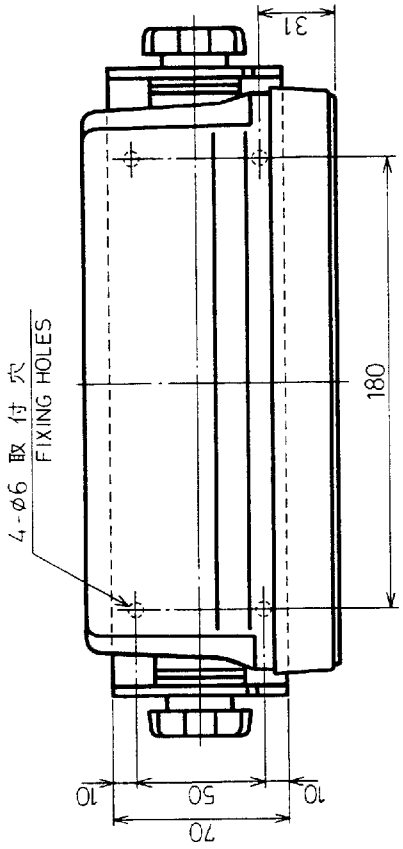
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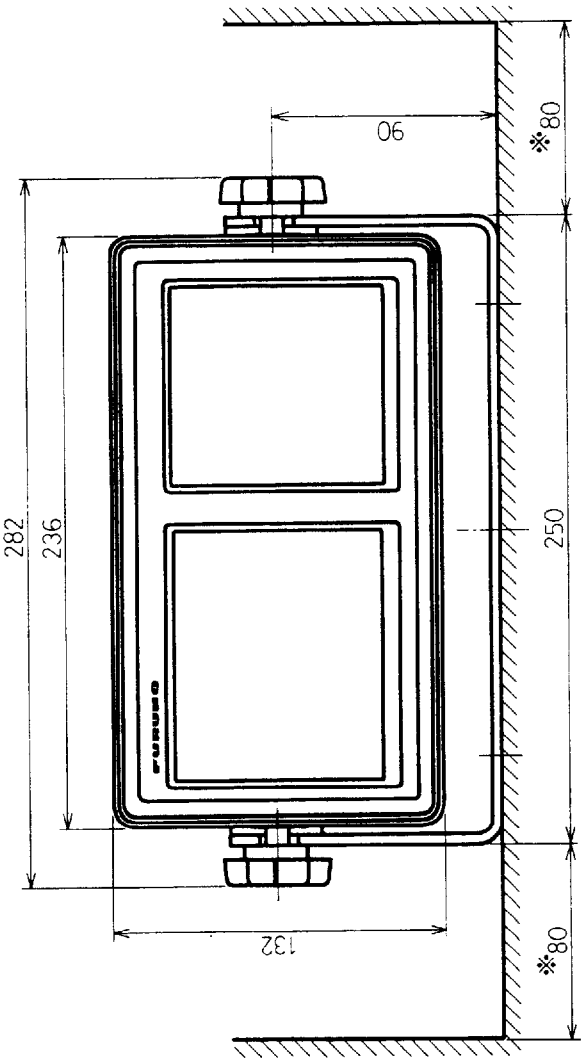


後面図 REAR VIEW



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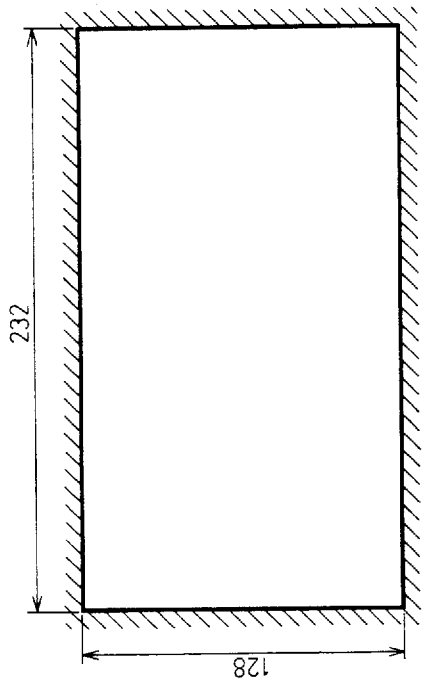
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検図 CHECKED	JUL 8 '91 M. USUDA	尺度 SCALE	1/3	ED-222	TABLE TOP MOUNT TYPE
製図 DRAWN	JUL 8'91 TOMITA	重量 WEIGHT	3 kg	図番 DWG. NO.	C2333-G03-A

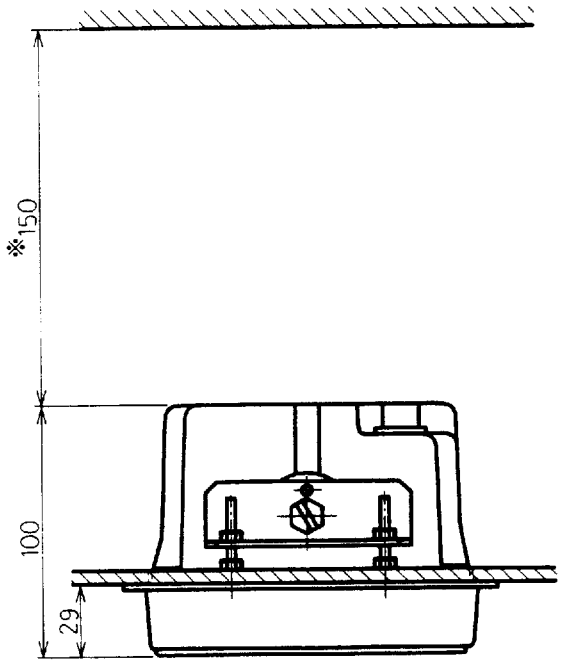
FURUNO ELECTRIC CO., LTD.

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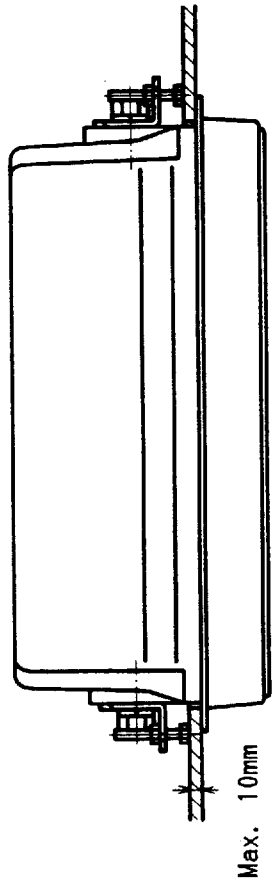
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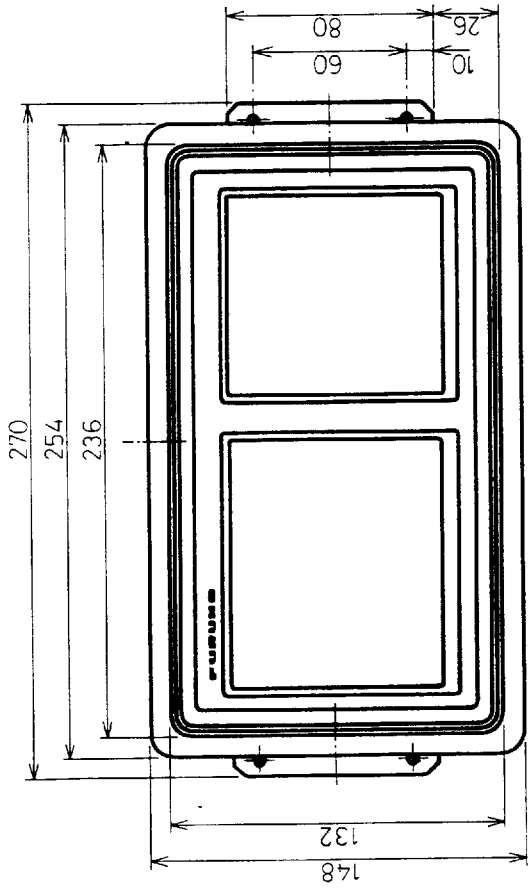
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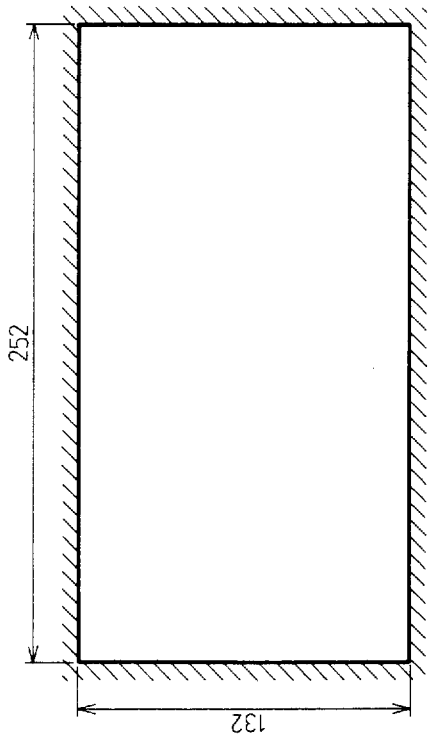
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検図 CHECKED	JUL 8,'91 M.USUDA	尺度 SCALE	1/3	ED-222	FLUSH MOUNT S-TYPE
製図 DRAWN	JUL 8 '91 TOMITA	重量 WEIGHT	2.8 kg	図番 DWG.NO.	C2333-G04-A

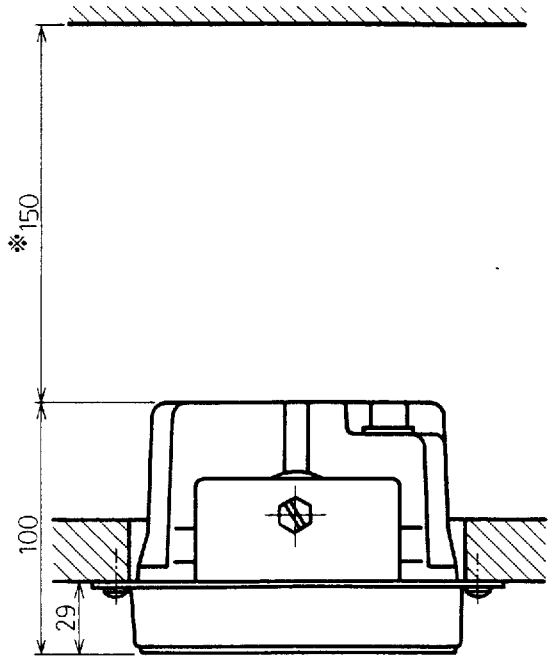
FURUNO ELECTRIC CO., LTD.

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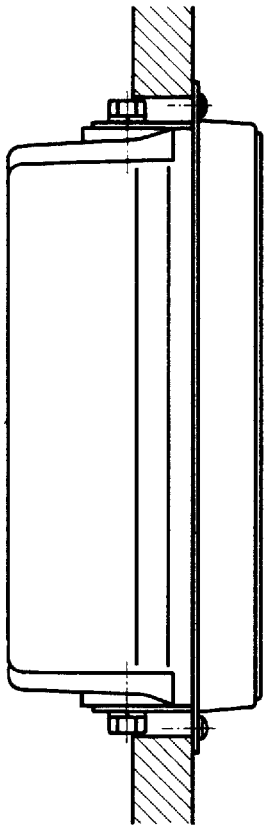
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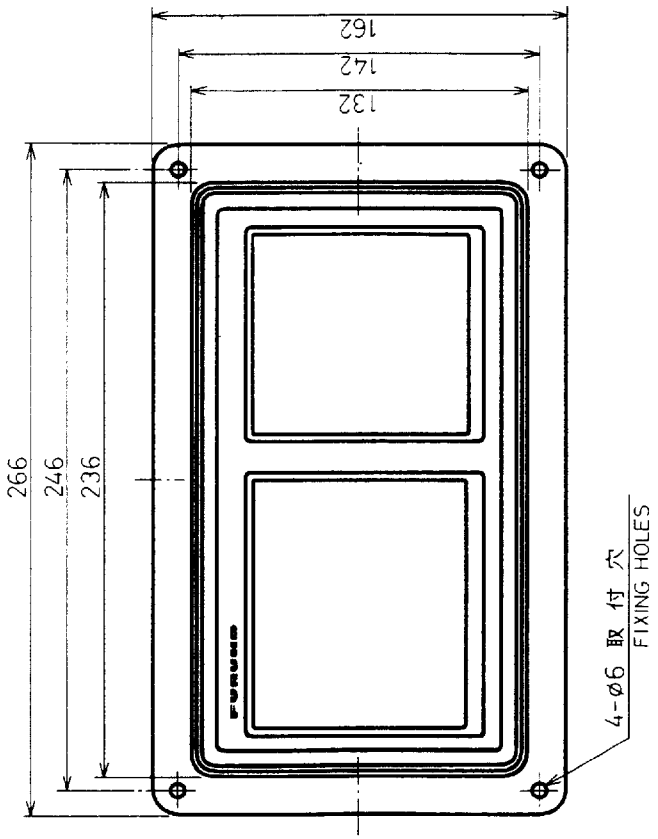
D - 3





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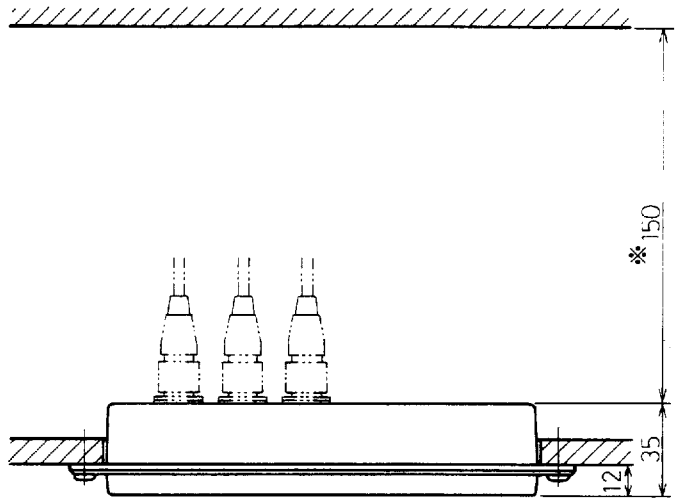
承認 APPROVED	JUL 8 '91 T.NAKANO	三角法 THIRD ANGLE PROJECTION		名称 TITLE	埋込み装備 F－型
検図 CHECKED	JUL 8 '91 M.USUDA	尺度 SCALE	1/3	ED-222	FLUSH MOUNT F-TYPE
製図 DRAWN	JUL 8 '91 TOMITA	重量 WEIGHT	28 kg	図番 DWG.NO.	C2333-G05-A

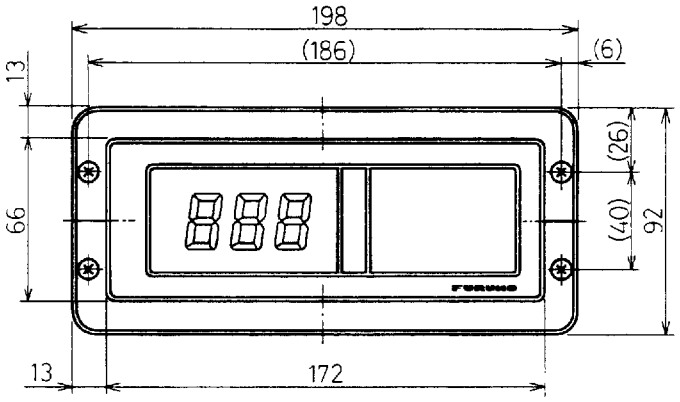
FURUNO ELECTRIC CO., LTD

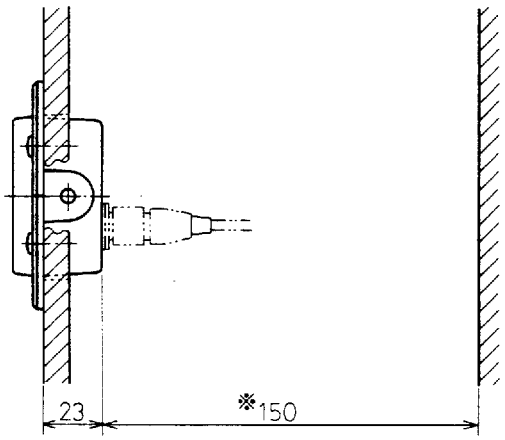
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FURUNO

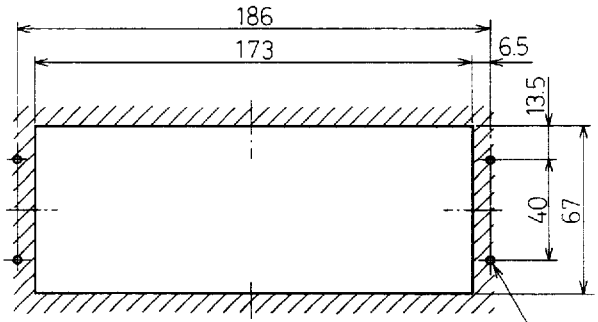
D - 4







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フラッシュマウント取付穴位置
FIXING HOLES

パネル取付穴寸法
CUTTING DIMENSION

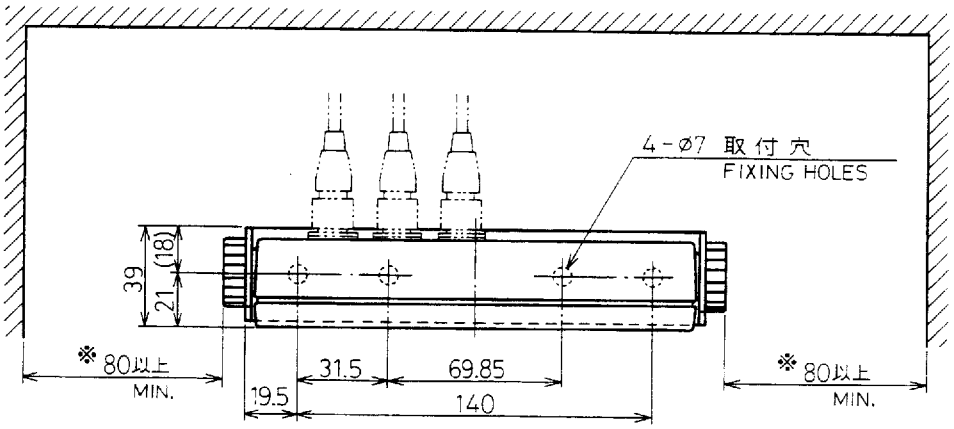
品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.NO.	摘要 REMARKS

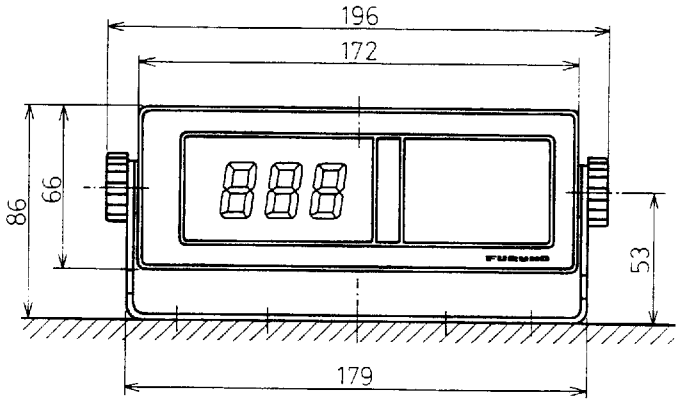
承認 APPROVED	JUL・8・'91 T.NAKANO	三角法 THIRD ANGLE PROJECTION		名称 TITLE	リモートディスプレイ(埋込型)
検図 CHECKED	JUL・8・'91 M. USUDA	尺度 SCALE	1/3	ED-2200	REMOTE DEPTH INDICATOR (FLUSH MOUNT)
製図 DRAWN	JUL・8・'91 TOMITA	重量 WEIGHT	0.33 kg	図番 DWG.NO.	C2333-G01-B

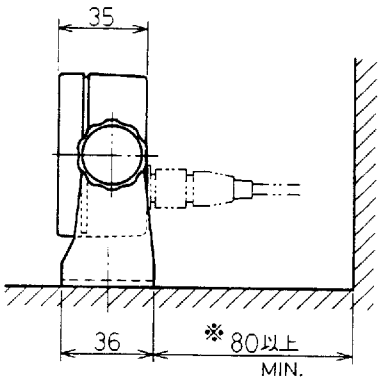
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※:推奨サービス空間
RECOMMENDED SERVICE SPACE

品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.NO.	摘要 REMARKS

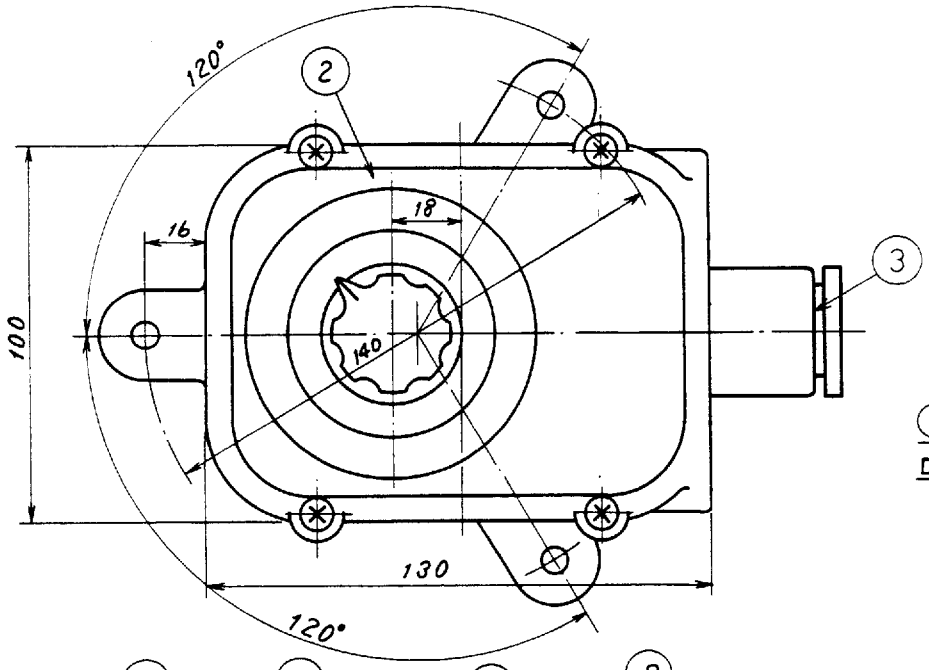
承認 APPROVED	JUL・8・'91 T.NAKANO	三角法 THIRD ANGLE PROJECTION		名称 TITLE	リモートディスプレイ(卓上型)
検図 CHECKED	JUL・8・'91 M.USUDA	尺度 SCALE	1/3	ED-2200	REMOTE DEPTH INDICATOR (TABLE-TOP MOUNT)
製図 DRAWN	JUL・8・'91 TOMITA	重量 WEIGHT	0.33 kg	図番 DWG.NO.	C2333-G02-B

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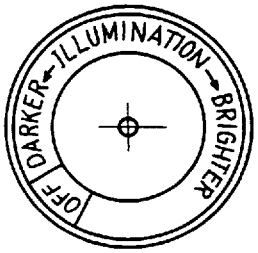
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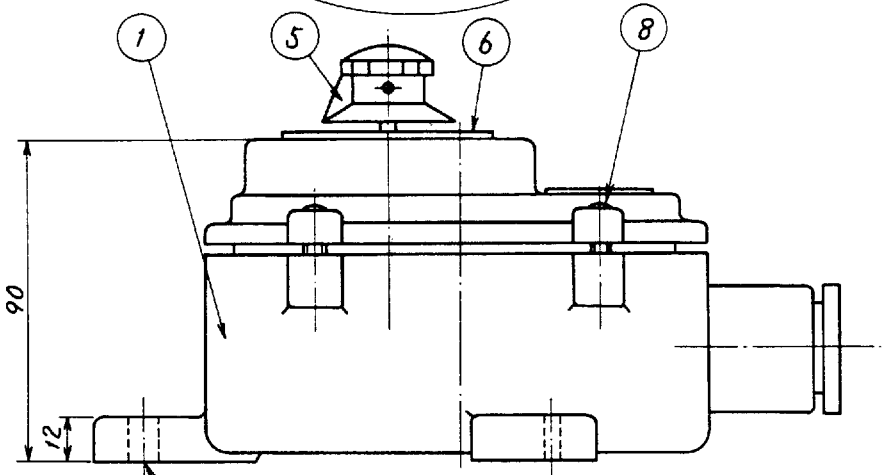
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⑥ 銘板詳細
DETAIL OF NAME PLATE





3-7φ穴 M6 取付ボルト用)
HOLE FOR M6 SET BOLTS

ITEM	NAME	MATERIAL	Q'TY	DWG.NO.	REMARKS
8	取付ネジ SET SCREW	BSBM2	1		
7					
6	銘板 NAME PLATE	SUS	1		
5	把手 KNOB	AC7AF	1		
4					
3	グランド GLAND	AC7AF	1		
2	フタ COVER	AC7AF	1		
1	体 BODY	AC7AF	1		

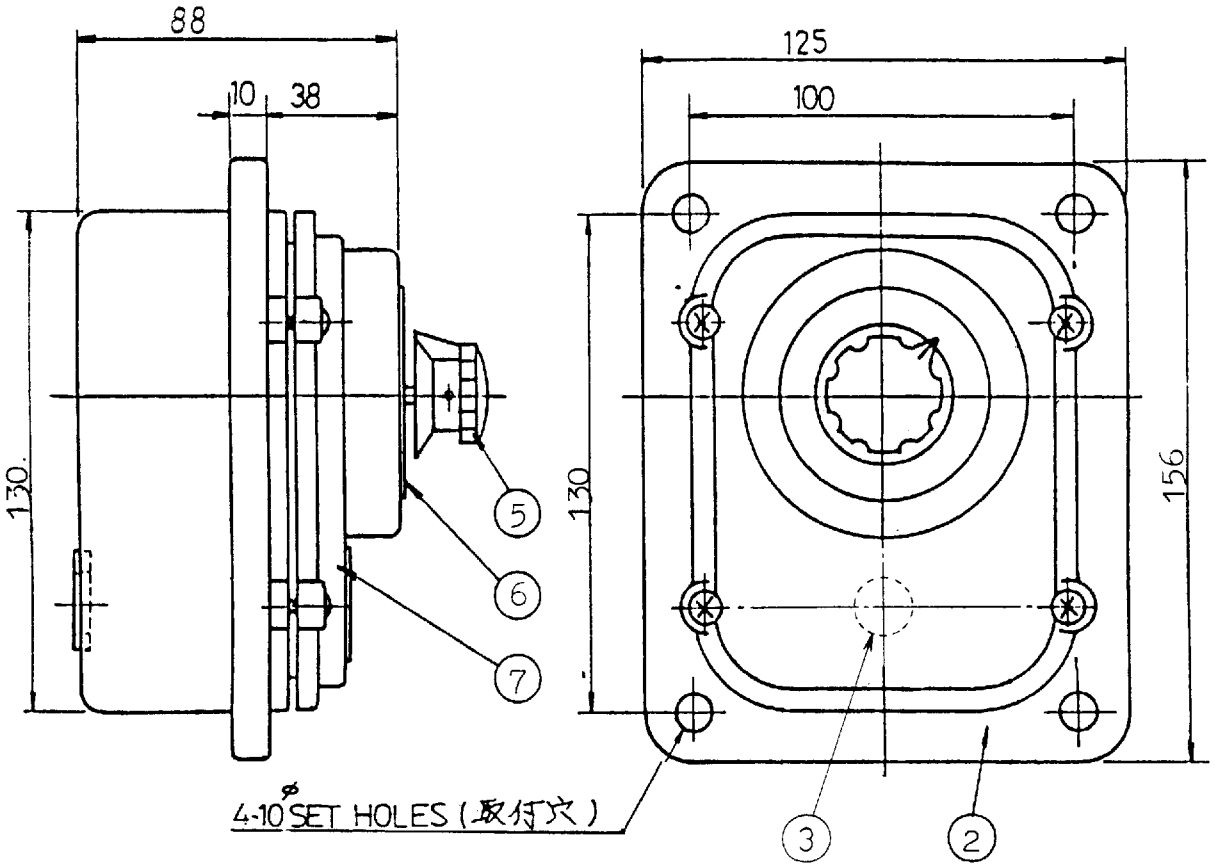
承認 APPROVED	JUL. 8. '91 T.NAKAJO	三角法 THIRD ANGLE PROJECTION		名称 TITLE	調光器外観図 OUTLINE OF DIMMER BOX 壁掛型 (BULKHEAD MOUNT)
検図 CHECKED	JUL. 8. '91 M. USUDA	尺度 SCALE	1/2	MF-22L-2A	
製図 DRAWN	JUL 8. '91 TOMITA	重量 WEIGHT	1.3 kg	図番 DWG.NO.	C2333-G06-B

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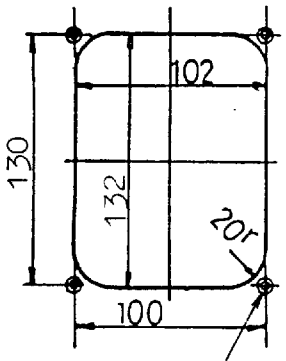
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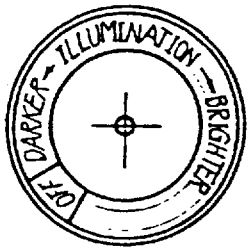
D - 7



PANEL CUT (パネル取付工事図)



⑥ DETAILS OF NAME PLATE
(銘板詳細)



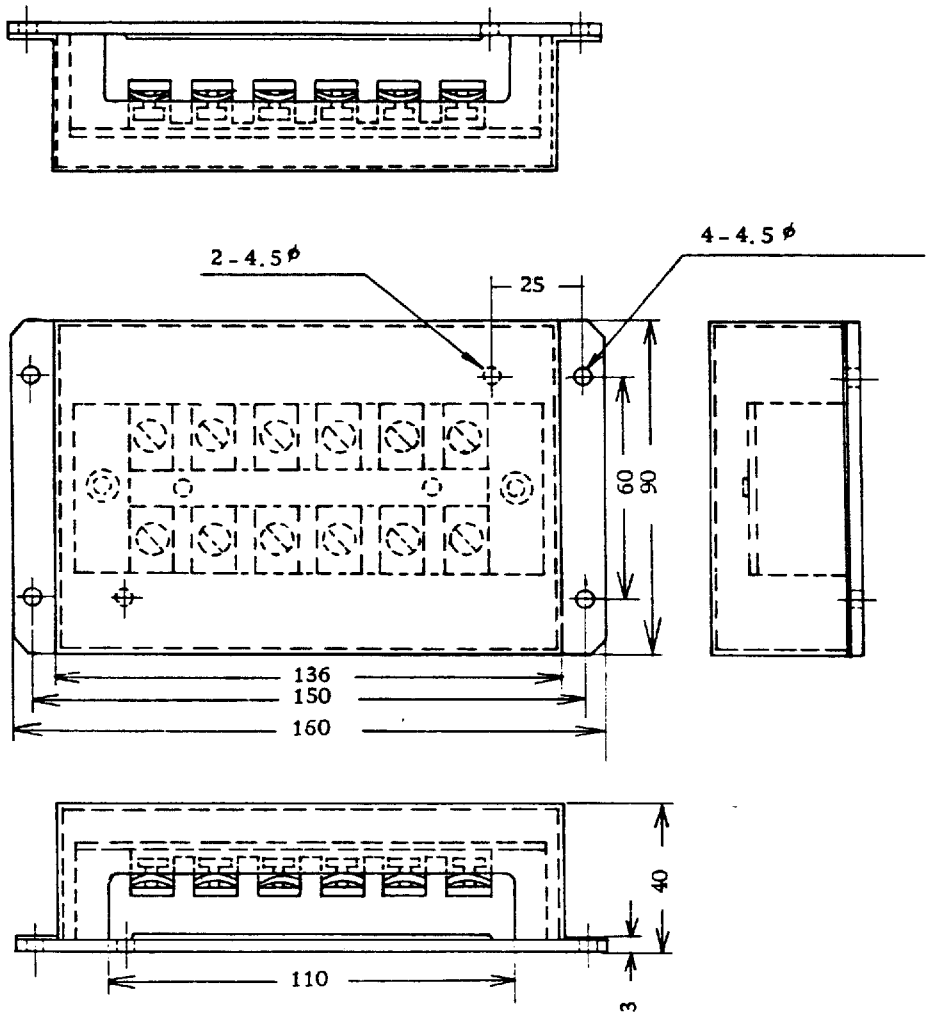
ITEM 品番	NAME 品名	MATERIAL 材質	Q'TY 数量	DWG.NO. 図番	REMARKS 摘要
7	カバー COVER	AC7AF	1		
6	銘板 NAME PLATE	SUS	1		
5	把手 KNOB		1		
4					
3	ブッシング BUSHING	RUBBER	1		φ15
2	本体 BODY	AC7AF	1		
1					

承認 APPROVED	JUL・8・'91 T.NAKANO	三角法 THIRD ANGLE PROJECTION		名称 TITLE	調光器外観図 OUTLINE OF DIMMER BOX 埋込型 (FLUSH MOUNT)
検図 CHECKED	JUL・8・'91 M.USUDA	尺度 SCALE	1/2	MF-221-1A	
製図 DRAWN	JUL・8・'91 TOMITA	重量 WEIGHT	1.2 kg	図番 DWG.NO	C2333-G07-B

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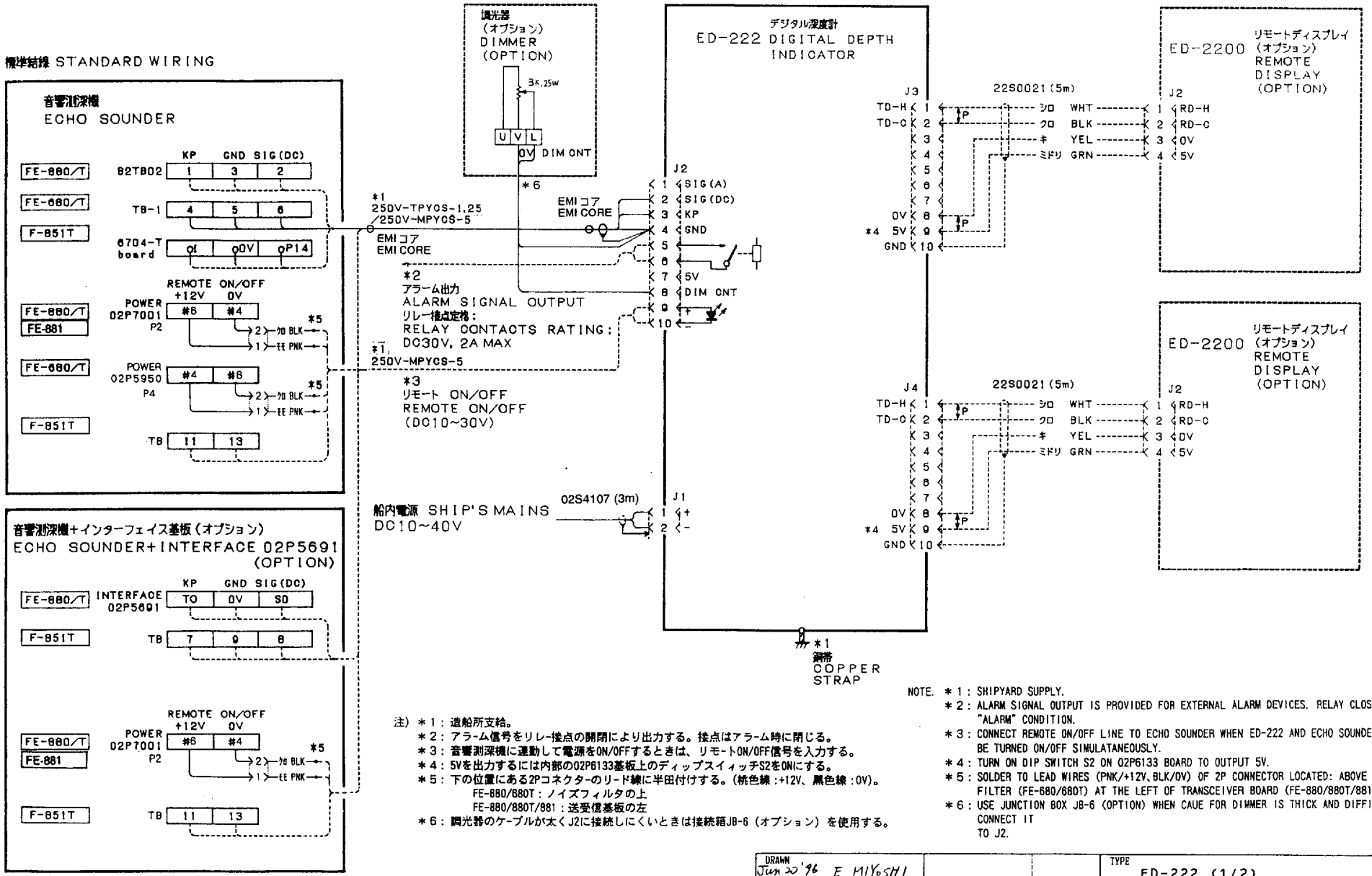


重 量
WEIGHT: 1 kg

Date	August, 1976	TITLE 接 続 箱 外 観 図 JUNCTION BOX OUTLINE	(Type J B−6型)
Checked			
Ref.		DWG. No. C4210-004-A	

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注) ＊1：造船所支給。
＊2：アラーム信号をリレー接点の開閉により出力する。接点はアラーム時に閉じる。
＊3：音響測深機に連動して電源をON/OFFするときは、リモートON/OFF信号を入力する。
＊4：5Vを出力するには内部の02P6133基板上のディップスイッチS2をONにする。
＊5：下の位置にある2Pコネクターのリード線に半田付けする。(桃色線：+12V、黒色線：0V)。
FE-880/680T：ノイズフィルタの上
FE-880/880T/881：送受信基板の左
＊6：調光器のケーブルが太くJ2に接続しにくいときは接続箱JB-6（オプション）を使用する。

NOTE. ＊1：SHIPYARD SUPPLY.
＊2：ALARM SIGNAL OUTPUT IS PROVIDED FOR EXTERNAL ALARM DEVICES. RELAY CLOSES UNDER "ALARM" CONDITION.
＊3：CONNECT REMOTE ON/OFF LINE TO ECHO SOUNDER WHEN ED-222 AND ECHO SOUNDER NEED BE TURNED ON/OFF SIMULATANEOUSLY.
＊4：TURN ON DIP SWITCH S2 ON 02P6133 BOARD TO OUTPUT 5V.
＊5：SOLDER TO LEAD WIRES (PNK/+12V, BLK/0V) OF 2P CONNECTOR LOCATED: ABOVE NOISE FILTER (FE-680/680T) AT THE LEFT OF TRANSCEIVER BOARD (FE-880/880T/881)
＊6：USE JUNCTION BOX JB-6 (OPTION) WHEN CAUE FOR DIMMER IS THICK AND DIFFICULT TO CONNECT IT TO J2.

FE-880/T、F-851Tは接続ケーブルが10mをこえるとインターフェイス基板02P5691の組み込み必要。

FE-880/T AND F-851T REQUIRE INTERFACE BOARD 02P5691 WHEN THE LENGTH OF THE CONNECTION CABLE EXCEEDS 10m.

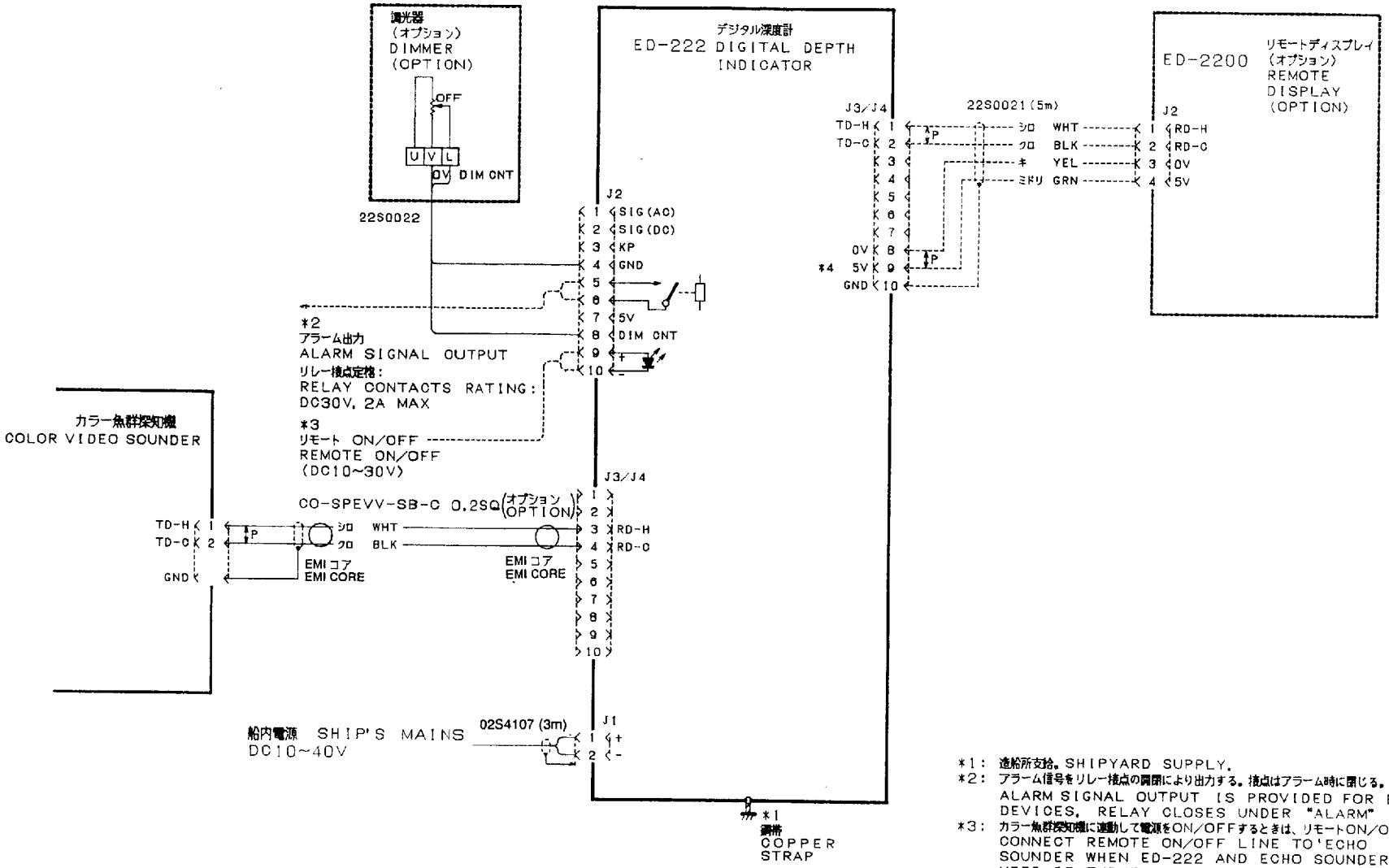
DRAWN Jun 20'96 E. MIYOSHI				TYPE ED-222 (1/2)
CHECKED Jun 20'96 K. OKAMOTO				名称 デジタル深度計
APPROVED Jun. 20'96 K. OKAMOTO				相互結線図
SCALE /	MASS kg	APPLICABLE TO: (MODEL)	BLOCK NO.	NAME DIGITAL DEPTH INDICATOR
DWG NO. C2333-C01- H				INTERCONNECTION DIAGRAM

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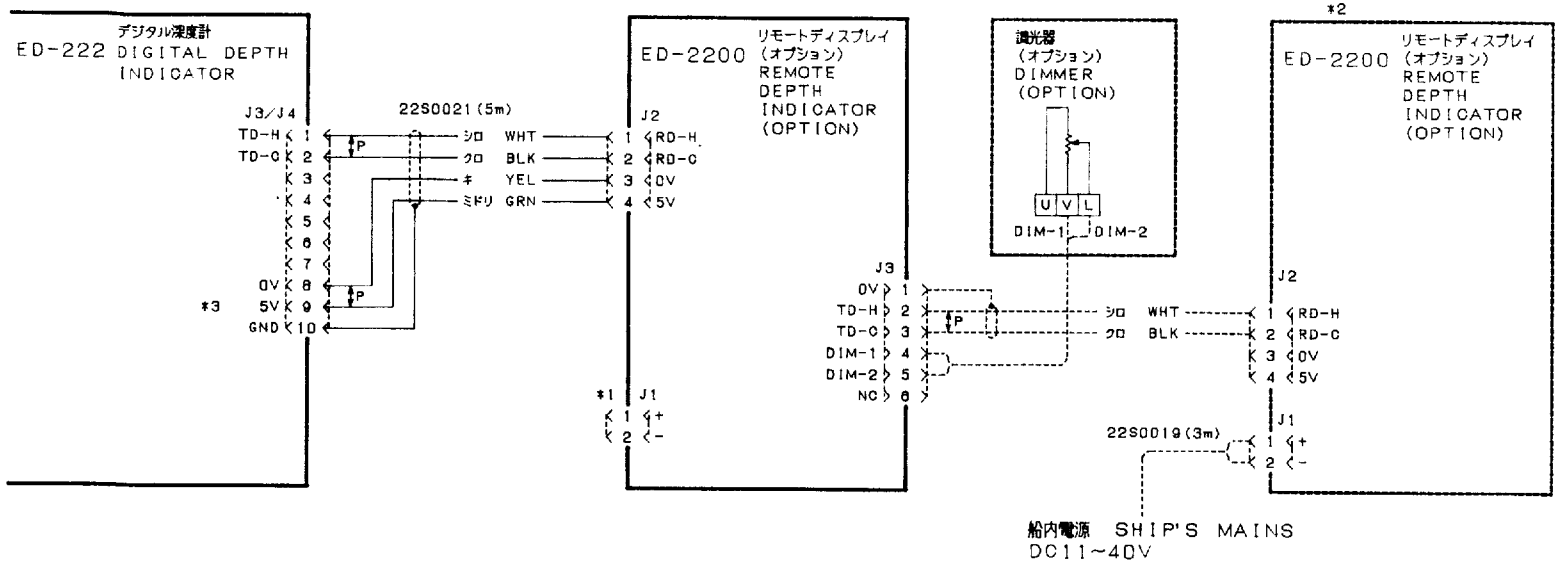
*1: 造船所支給。SHIPYARD SUPPLY.
*2: アラーム信号をリレー接点の開閉により出力する。接点はアラーム時に閉じる。
ALARM SIGNAL OUTPUT IS PROVIDED FOR EXTERNAL ALARM DEVICES. RELAY CLOSES UNDER "ALARM" CONDITION.
*3: カラー魚群探知機に連動して電源をON/OFFするときは、リモートON/OFF信号を入力する。
CONNECT REMOTE ON/OFF LINE TO 'ECHO SOUNDER WHEN ED-222 AND ECHO SOUNDER NEED BE TURNED ON/OFF SIMULTANEOUSLY.
*4: 5Vを出力するには内部の02P6133基板上のディップスイッチS2をONにする。
TURN ON DIP SWITCH S2 ON 02P6133 BOARD TO OUTPUT 5V.

DRAWN Jun.20'96 E.MIYOSHI			TYPE ED-222 (2/2)
CHECKED Jun.20-'96 K.OKAMOTO			名称 デジタル深度計
APPROVED Jun.20-'96 K.OKAMOTO			相互結線図
SCALE / MASS kg	APPLICABLE TO: (MODEL)	BLOCK NO.	NAME DIGITAL DEPTH ONDICATOR
DWG NO.			

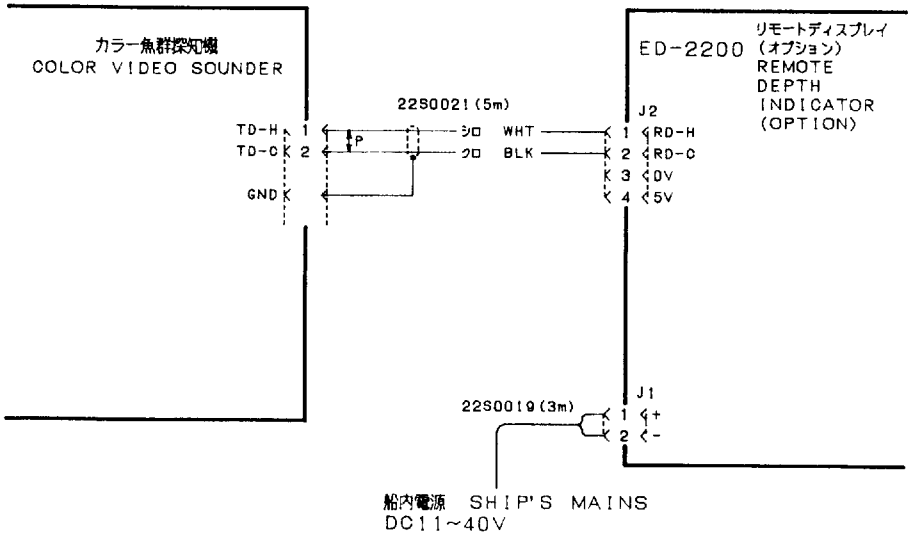
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カラー魚群探知機に接続する場合



*1: ED-222のJ3又はJ4に直接接続するED-2200はJ3/J4の5Vより電源の供給を受けるので、J1に船内電源を接続しなくてもよい。
WHEN ED-2200 IS CONNECTED TO J3/J4 OF ED-222, CONNECTION OF SHIP'S MAINS TO ED-2200 IS UNNECESSARY.

*2: ED-2200は縦続で何台でも接続できる。但し、縦続の2台目以降は船内電源を接続すること。
ED-2200'S CAN BE CONNECTED IN SERIES AS MANY AS YOU WANT, PROVIDED THAT SHIP'S MAINS ARE SUPPLIED TO THEM EXCEPT FOR THE FIRST ONE.

*3: 5Vを出力するには内部のディップスイッチ(02P6133のS2)をONにする。
TURN ON DIP SWITCH S2 ON 02P6133 BOARD TO OUTPUT 5V.

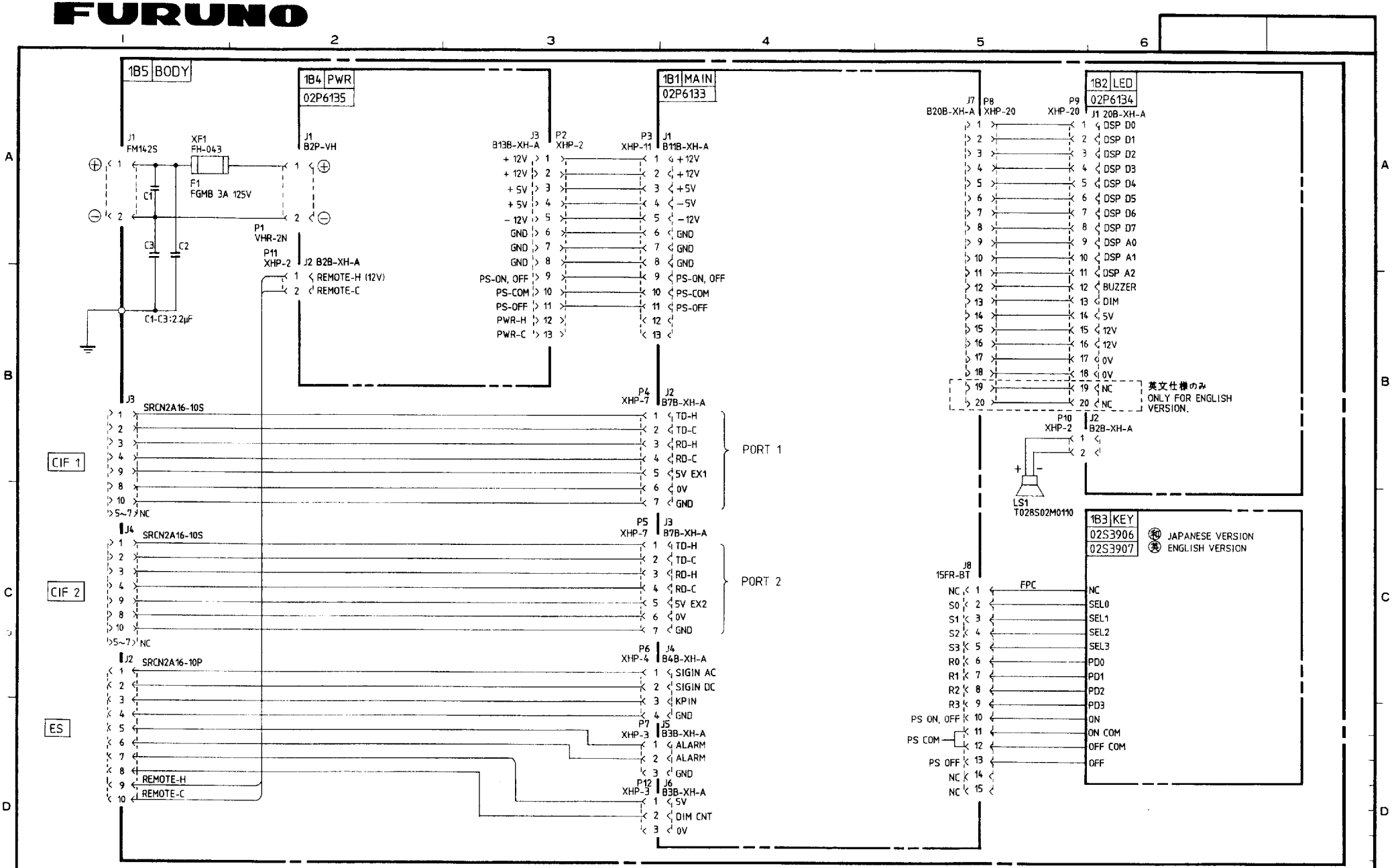
承認 APPROVED	OCT.23.'91 T.YAKAGI	名称 TITLE	相互結線図 ED-2200 INTERCONNECTION DIAGRAM
検図 CHECKED	OCT.23.'91 M.USUDA		
製図 DRAWN	OCT.23.'91 T.OMITA	図番 DWG. NO.	C2333-C03-B

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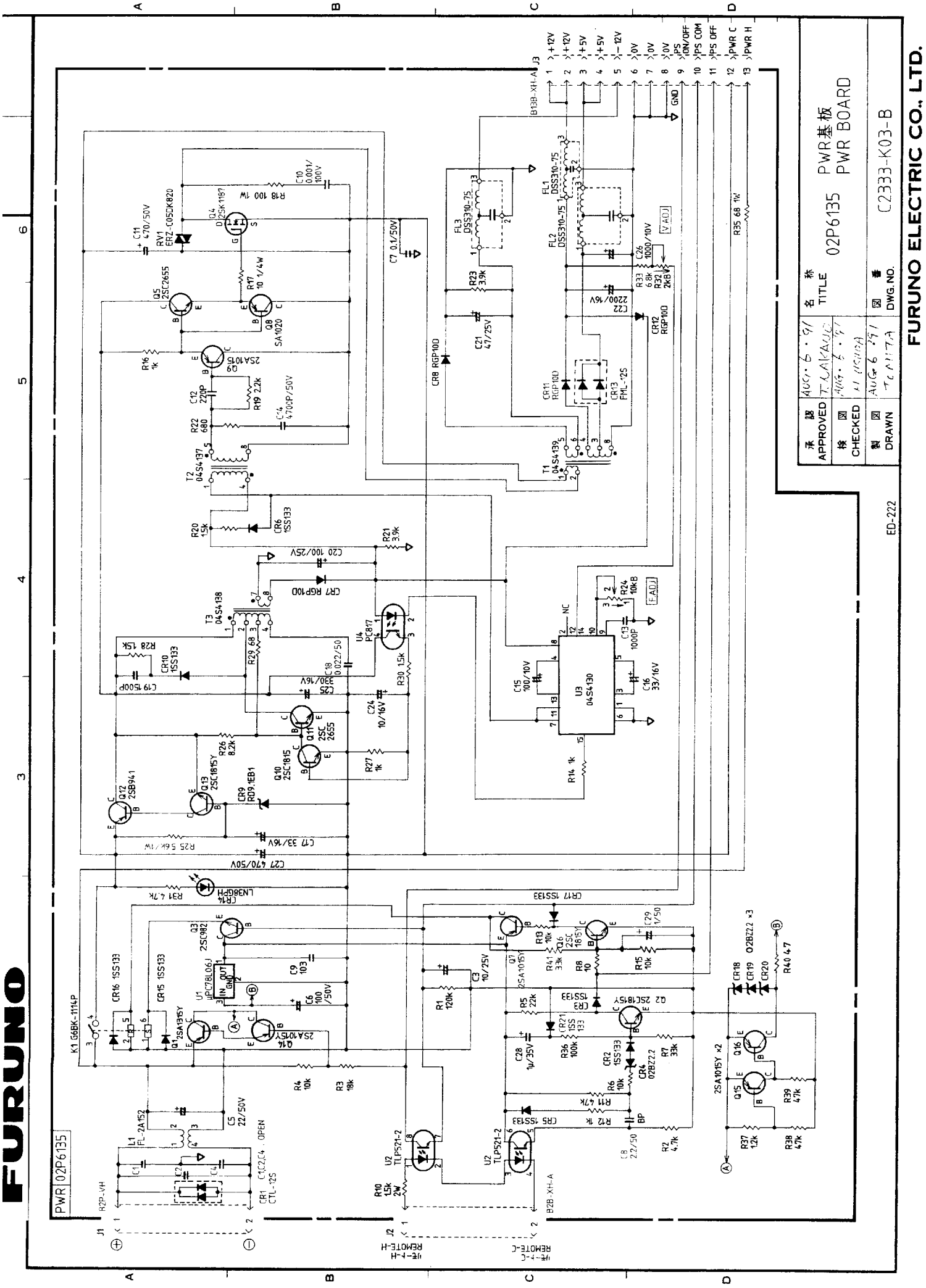
承認 APPROVED	JUL.17.'01	名称 TITLE	ED-222 デジタル深度計 DIGITAL DEPTH INDICATOR
検図 CHECKED	JUL.17.'01		
製図 DRAWN	JUL.17.'01	図番 DWG.NO.	C2333-K02-B

ED-222

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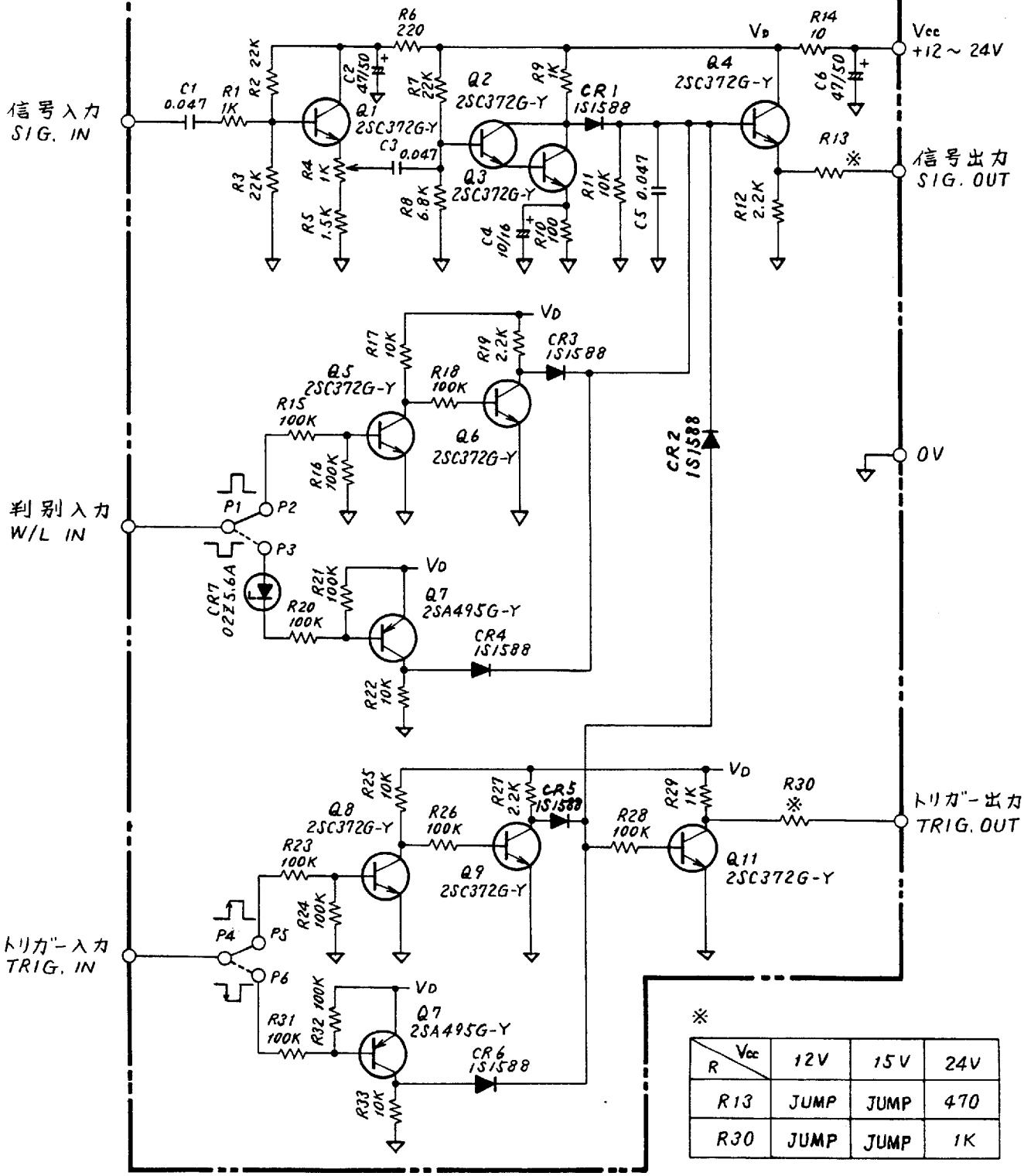


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02P-5691-1



※

R \ Vcc	12V	15V	24V
R13	JUMP	JUMP	470
R30	JUMP	JUMP	1K

品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.NO.	摘要 REMARKS

承認 APPROVED		三角法 THIRD ANGLE PROJECTION	名称 TITLE: 02P-5691-1 インターフェース INTERFACE
検図 CHECKED	Nov. 11. 80	尺度 SCALE	
製図 DRAWN	Nov. 1. 80 T. Toyoda	重量 WEIGHT kg	図番 DWG.NO. C2232-028-A

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APPENDIX

A. Connecting with Navigational Echosounder FE-880T

When connecting to FE-880T with the distance of more than 10m, the interface board 02P5691 (option) is required.

The connection is made as follows.

1) Mount the interface pc board onto the transceiver module.

2) Connect the lead wires as illustrated in figures 1 and 2.

3) Short-circuit R13 and R30 with jumper leads.

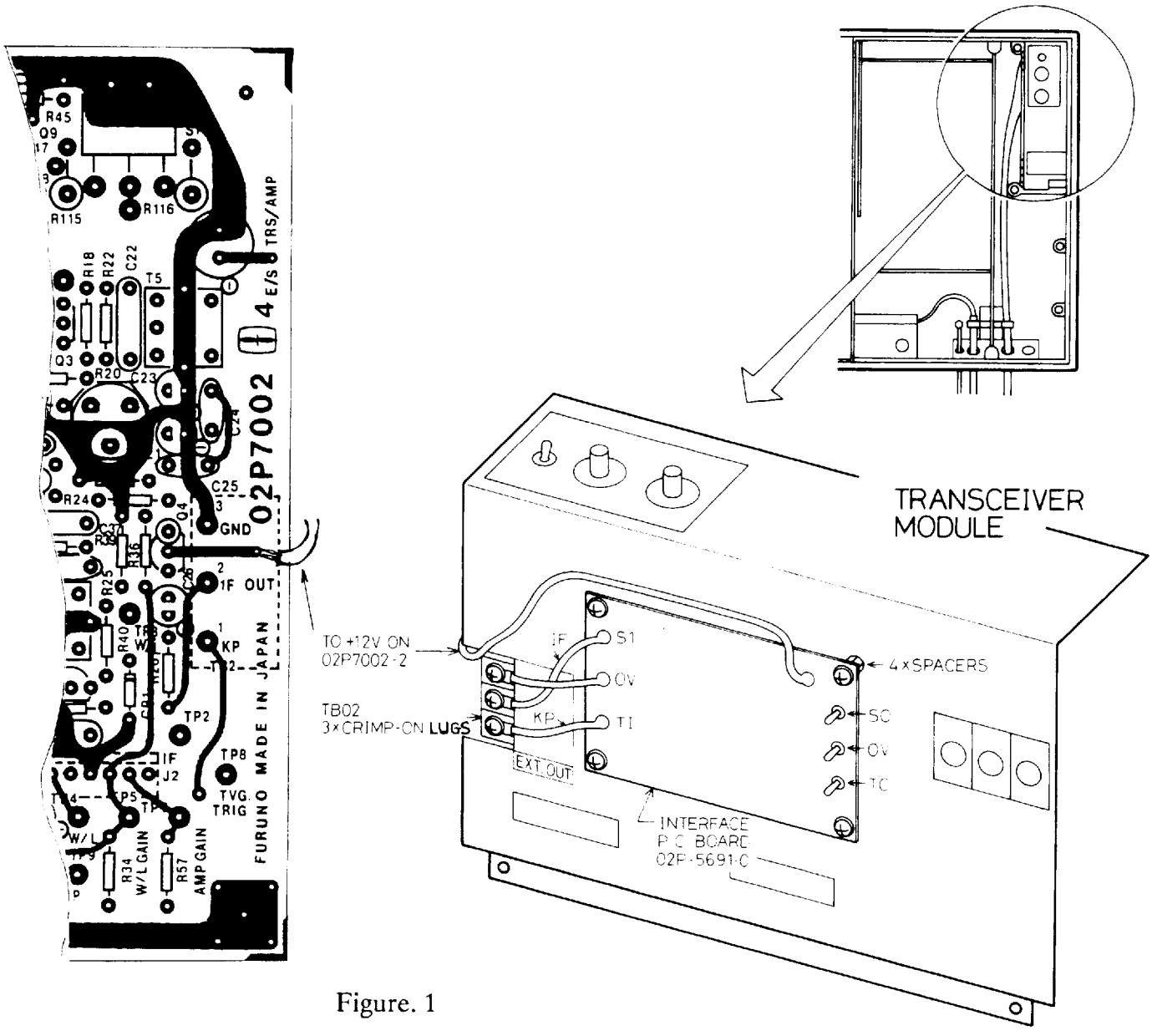


Figure. 1

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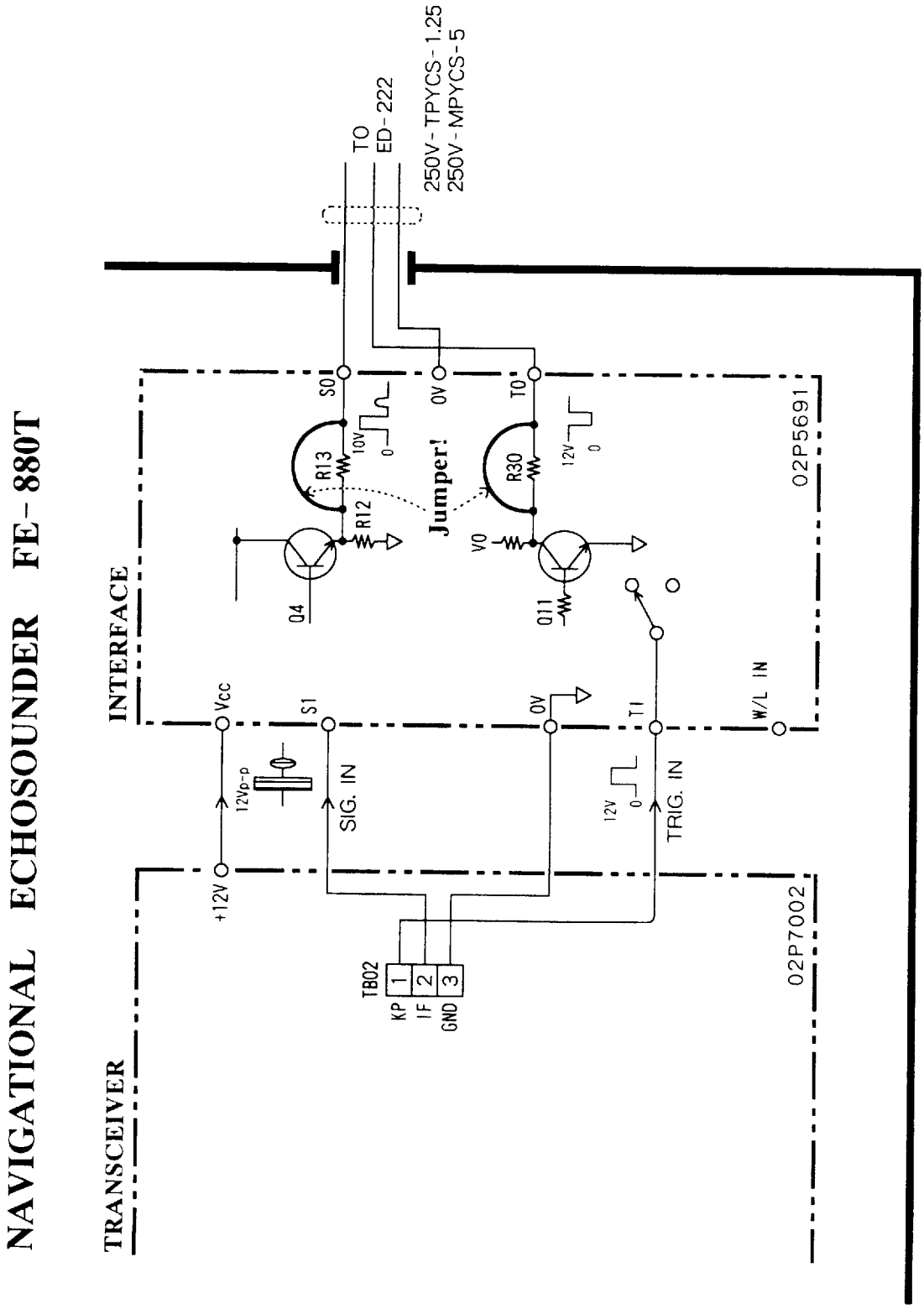


Figure. 2 Connection Diagram