

## INSTALLATION MANUAL

### COLOR SCANNING SONAR

### CSH-55

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© FURUNO ELECTRIC CO., LTD.

9-52, Ashihara-cho,  
Nishinomiya, Japan 662

Telephone: 0798-65-2111  
Telefax: 0798-65-4200

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(ETMI)

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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 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.



**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.

# **WARNING**



**Only qualified personnel should work inside the equipment.**

This equipment uses high voltage electricity which can shock, burn, or cause death.

**Turn off the power at the ship's mains switchboard before beginning the installation. Post a warning sign near the switchboard to ensure that the power will not be applied while the equipment is being installed.**

Serious injury or death can result if the power is not turned off, or is applied while the equipment is being installed.

# **CAUTION**



**Ground the equipment.**

Ungrounded equipment can give off or receive electro-magnetic interference or cause electrical shock.

**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 equipment.

**Do not exceed speed noted in the specifications when operating the equipment or during lowering or raising of the transducer.**

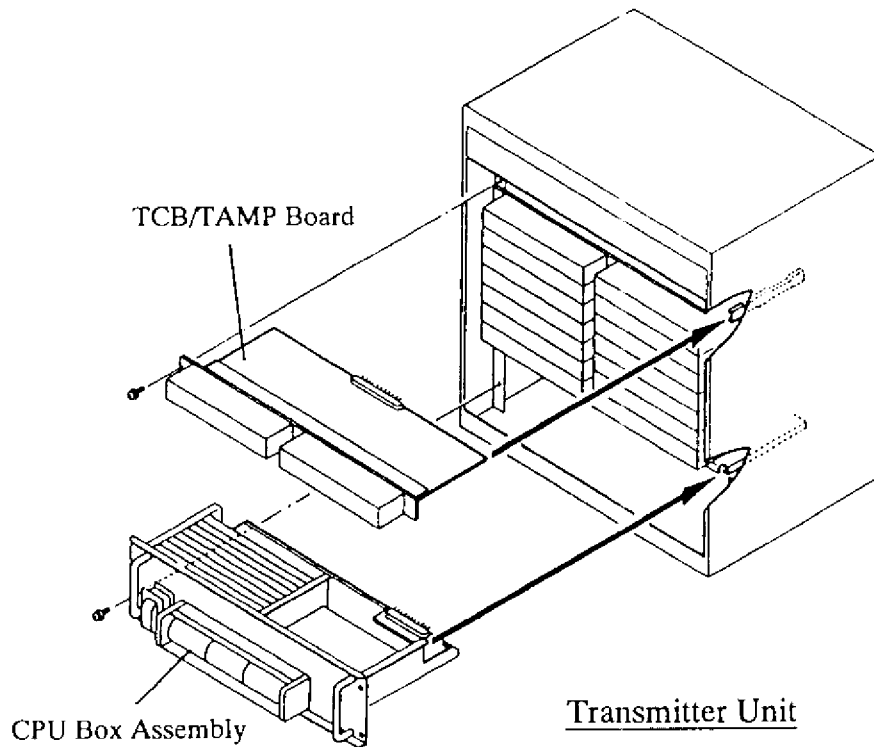
The transducer may become damaged.

**The zinc block attached to the transducer must be replaced yearly.**

The junction between the transducer and main shaft may corrode, which can result in loss of the transducer or water leakage inside the ship.

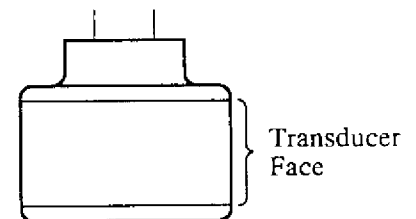
# GENERAL REMARKS ON INSTALLATION

1. When placing the CPU box assembly and the TCB/TAMP board into the transmitter unit main body, slide them along the guide slots. Otherwise the connector pins in the back will be damaged.



2. If the raise/lower motor in the hull unit becomes overloaded due to net entanglement around the transducer or because of bent transducer shaft, the thermal relay in the raise/lower control box operates to cut off the power to the raise/lower motor. In this case, take appropriate measures referring to "Warning" in the operator's manual. This should be explained to the users at installation.

3. The transducer face has been coated with an antifouling paint to keep it free from marine life and fouling. It must be recoated at least once a year at dry docking. This should also be explained to the operator at installation.

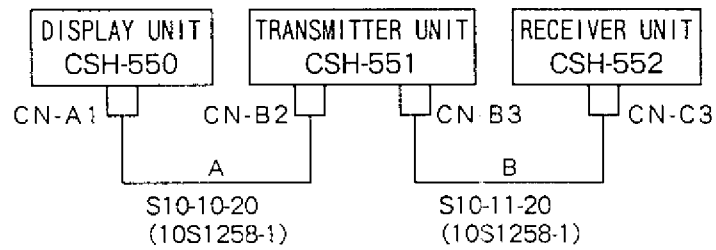


Use only "Marine Star 20C (RED-N)" type antifouling paint, manufactured in Japan by Chugoku Marine Paint Co., Ltd. Coat only the transducer face; coating metal areas causes corrosion.

4. Do not transmit with the transducer placed in air (namely, when vessel is dry docked). This will damage the equipment.

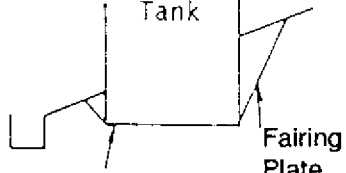
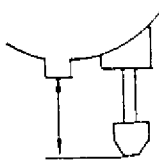
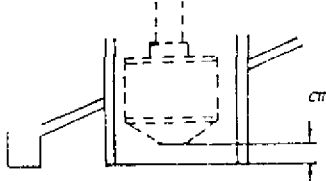
5. The maximum allowable length of cables A and B is 20m each. When this can not be observed, cable A should satisfy the following.

$$A \leq 80 \text{ m} \quad B \leq 20 \text{ m}$$



# INSTALLATION CHECK LIST

## 1. Check on the Slip or in Dry Dock

No.	Check Item	Ratings	Refer to page	Result
1	Retraction tank level	 <p>The retraction tank should not protrude below the keel.</p>	16	
2	Transducer travel (lowered by hand crank) <i>Note: A clearance of 1.5m or more is required under the bottom of the retraction tank.</i>	 <p>Minimum value: 500mm</p>	16	cm
3	Clearance between the transducer and the bottom of retraction tank when the transducer is completely retracted by hand crank	 <p>Recommended clearance: more than 5cm</p>		cm
4	Wiring check: 1. All cables are correctly connected. 2. All lead wires are tightly fixed with contact pins or crimp-on lugs. 3. All screws are securely tightened. 4. No short circuit is present between lead wires. 5. Cables are firmly bound. 6. Cable shields are properly grounded.		21 to 35	
5	Connection of connectors	The connectors are securely plugged into the proper receptacles.		
6	Grounding	Each unit is grounded with a copper strap.	21	
7	Fixing of cable	Cables are securely fixed by cable clamp or cable gland.		
8	Interference	TV set is not placed in the vicinity of the receiver unit.		

## 2. Final Check

No.	Check Item	Descriptions	Refer to page	Result
1	Ship's mains (Input) voltage	Ship's mains (Input) voltage is stable at around 100VAC.	36	
2	Line voltages	Within ratings.	36	
3	Watertightness	Water should not leak from the flange or the top of shaft sleeve.		
4	Raise/Lower operations	Raise/lower operation of the hull unit can be independently controlled by the switch board in the raise/lower control box.	37	
5	Heading adjustment	Adjust heading if bow mark on hull unit flange is not in line with ship's bow.	38	
6	Selection of navigation and fishing data	The DIP switch (DP-1) in the Interface Unit is preset in accordance with the combined equipment.	Operator's Manual	
7	Adjustment of Interface Unit	R27, R36, R55 and R56 in the interface unit are set properly.	39	
8	Presetting of FNZ marker's positions	The positions of net sonde transmitters are set on the FNZ switches in the interface unit.	Operator's Manual	
9	Recording sea trial data		5	
10	Operating instructions to operators		Operator's Manual	

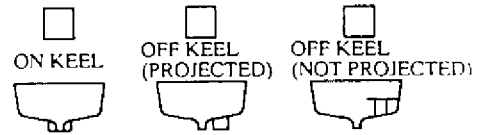
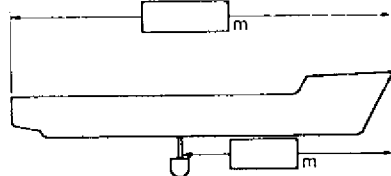


# FULL CIRCLE COLOR SCANNING SONAR DATA SHEET FOR SEA TRAIL

• SHIP NAME \_\_\_\_\_ TYPE \_\_\_\_\_ STEEL FRP WOOD \_\_\_\_\_

• SERIAL NO. DISPLAY UNIT \_\_\_\_\_ HULL UNIT \_\_\_\_\_

• HULL UNIT POSITION



XDCR TRAVEL \_\_\_\_\_ mm

FROM KEEL \_\_\_\_\_ mm

PORT

STARBOARD

XDCR TRAVEL FROM KEEL LINE \_\_\_\_\_ mm

• DATE \_\_\_\_\_ TIME \_\_\_\_\_

• PLACE \_\_\_\_\_ DEPTH \_\_\_\_\_ m

• WEATHER \_\_\_\_\_ SEA CONDITION \_\_\_\_\_

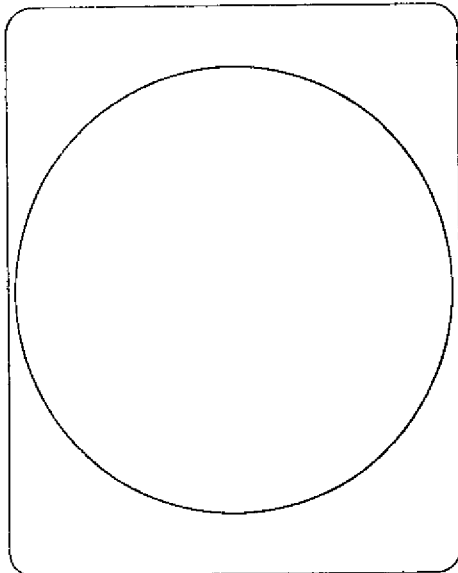
RANGE

m

TILT

°C

TARGET



MODE \_\_\_\_\_

GAIN \_\_\_\_\_

CRT BRILLIANCE \_\_\_\_\_

TVG

NEAR

MEDIUM

FAR

TX CYCLE \_\_\_\_\_

TX OUTPUT \_\_\_\_\_

PULSELENGTH \_\_\_\_\_

NOISE LIM \_\_\_\_\_

AGC \_\_\_\_\_

IR \_\_\_\_\_

HOR BEAM \_\_\_\_\_

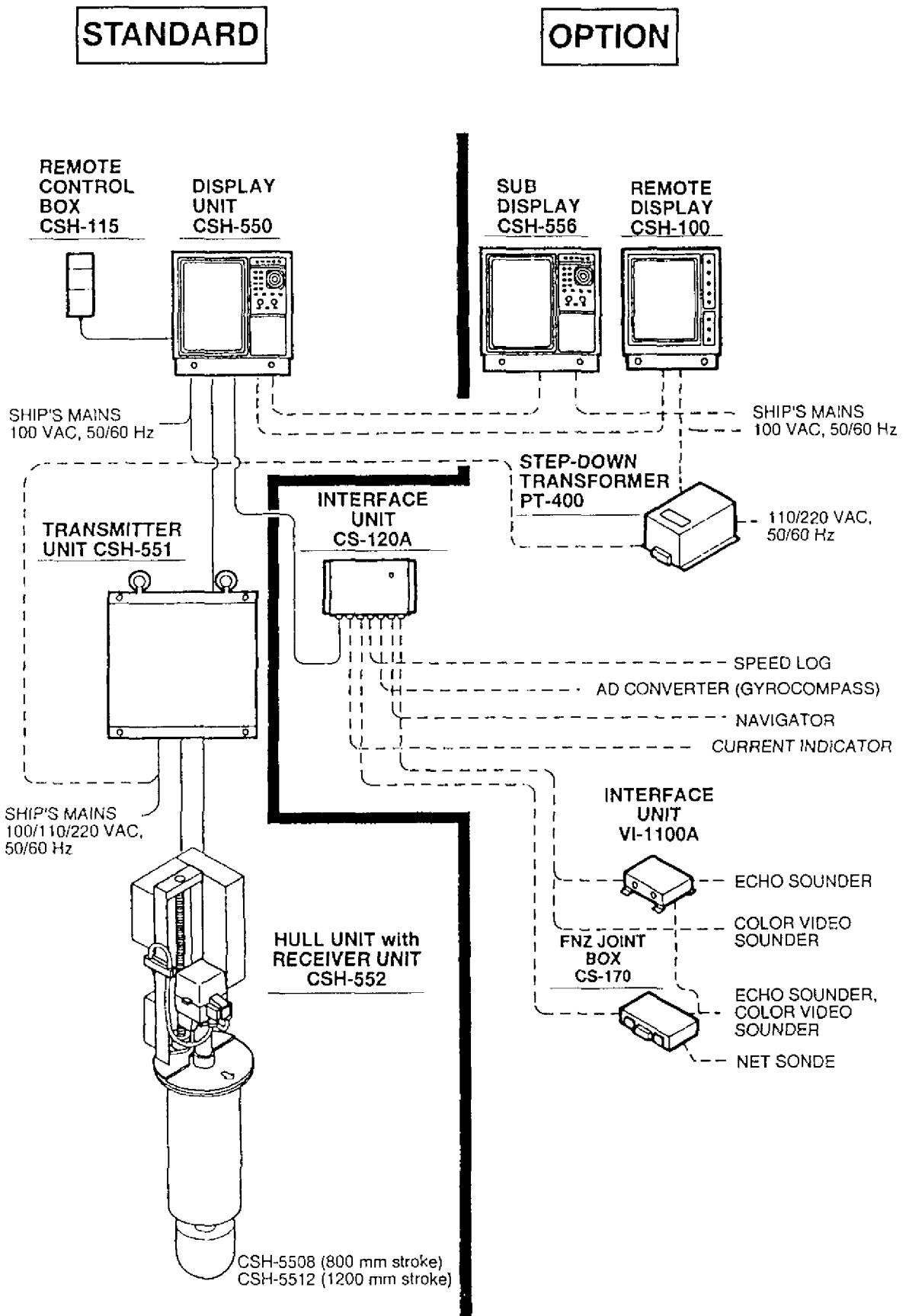
VER BEAM \_\_\_\_\_

CRUISING NOISE at  knots

TIME TO HOIST XDCR  sec.  
DURING CRUISING

REMARKS

# SYSTEM CONFIGURATION



# EQUIPMENT LIST

## Standard Supply

No.	Name	Type	Dimensions(mm) W×H×D	Qty	Weight (kg)	Remarks	
1	Display Unit	CSH-550	421×431×503	1	34		
2	Transmitter Unit	CSH-551	630×644×380	1	82		
3	Receiver Unit	CSH-552	556×525×300	1	26		
4	Hull Unit	CSH-5508	515×2070×824	1	239	50K	800mm travel
					260	28K	
		CSH-5512	515×2470×824		289	50K	1200mm travel
					310	28K	
5	Remote Control Box	CSH-115	72×180×18	1	0.4		
6	Installation Materials	CP10-03700		1 Set		000-069-539	
7	Spare Parts	SP10-02200		1 Set		000-069-538	

## Optional Supply


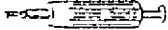
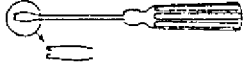
No.	Name	Type	Code No.	Weight (kg)	Remarks
1	FNZ Joint Box	CS-170		2	
2	Step-down Transformer	PT-400		22	For display unit
3	E/S Interface Unit	VI-1100A		2	
4	Remote Display Unit	CSH-100		25	
5	Sub-display Unit	CSH-556		33	
6	Interface Unit	CS-120A		3	
7	Console Kit	CSH-1200			
8	FRP Retraction Tank	OP10-1	000-068-861		
9	Retraction Tank	SHG-0001	006-904-340	100	
10	TR Inverter	TR-24100	000-067-351		
		TR-2435	000-018-414		

No.	Name	Type	Code No.	Remarks	
11	Hood	FP10-00120	006-947-350		
12	Filter	FP10-00140	006-947-390		
13	Vinyl Cover	10-026-0601-3	000-800-199		
14	Handle	FP10-01201	006-989-020		
15	Signal Cable	S10-10-5 (38P)	006-972-240	5m	Display Unit   Transmitter
16	Signal Cable	S10-10-10 (38P)	006-972-250	10m	
17	Signal Cable	S10-10-15 (38P)	006-972-260	15m	
18	Signal Cable	S10-11-5 (38P)	006-972-270	5m	Transmitter   Receiver
19	Signal Cable	S10-11-10 (38P)	006-972-280	10m	
20	Signal Cable	S10-11-15 (38P)	006-972-290	15m	
21	Signal Cable	S10-12-5 (38P)	006-972-300	5m	Transmitter   Receiver
22	Signal Cable	S10-12-10 (38P)	006-972-310	10m	
23	Signal Cable	S10-12-15 (38P)	006-972-320	15m	
24	Signal Cable	S10-14-5	006-972-330	5m	Transmitter   Hull Unit
25	Signal Cable	S10-14-10	006-972-340	10m	
26	Signal Cable	S10-14-15	006-972-350	15m	
27	Signal Cable Set	CP10-03800	006-972-370	Max.50m	Display - Tx
28	Extension Cable Set	CSH-1600			

### Accessories

No.	Name	Type	Code No.	Qty	Remarks
1	Hook	10-026-8226-1	100-008-801	1	For remote control box
2	Tapping Screw	3×14 SWRM10	000-800-172	2	

### Optional Supply Special Tools

No.	Name	Type	Code No.	Outline
1	Crimping Tool	06-1001-016		
2	Pin Extractor	06-1877-04	000-519-595	
3	Guide Pin Setting Tool	10-910-0179-0		

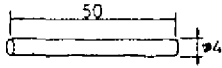
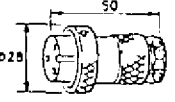
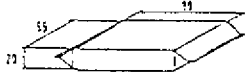
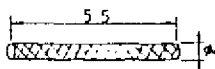
### Spare Parts

No.	Name	Type	Code No.	Qty	Remarks
1	Fuse	FGBO-A 2A 125VAC	000-549-062	10	
2	Fuse	FGBO 10A 125VAC	000-549-065	5	
3	Connector Housing	XHP-7	000-105-683	2	
4	Connector Housing	XHP-15	000-110-946	2	
5	Connector Housing	XHP-10	000-110-947	2	
6	Connector Housing	VHR-3N	000-505-886	2	
7	Fuse	FGBO-A 3A 125VAC	000-549-063	10	
8	Contact Assy.	80-0075	006-979-310	20	
9	Connector Puller	10-044-2431-0	100-122-480	1	

# FURUNO

C1297-M01-D

CODE NO. 006-973-770  
TYPE CP10-03701

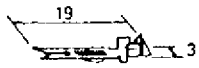
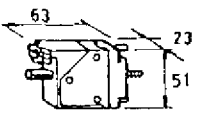
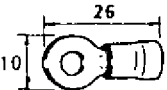
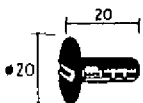
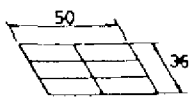
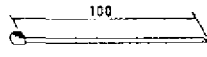
工事材料表 INSTALLATION MATERIALS		CSH-55 カラースキニングソナー COLOR SCANNING SONAR (CSH-550 指示装置 DISPLAY UNIT)			
番号 No.	名称 NAME	略図 OUTLINE	型名 / 規格 DESCRIPTIONS	数量 Q'TY	用途 / 備考 REMARKS
1	イラックスチューブ INSULATION TUBE		4MMX5CM # YEL CODE NO. 000-100-923	1	
2	コネクタ CONNECTOR		NCS-253-P CODE NO. 000-506-503	1	
3	クーラーパテ COOLER PUTTY		200G 作り 5010 CODE NO. 000-807-621	1	送受信装置 ケーブルクランプ部 FOR RX&TX UNIT
4	シールドスリーブ SHIELD SLEEVE		ZS-06H *0.055M* CODE NO. 000-807-634	14	受信装置 ケーブルクランプ部 FOR RX UNIT

# FURUNO

C1297-M02-D

CODE NO. 006-972-400  
TYPE CP10-03702






10CF-X-9402-2

工事材料表 INSTALLATION MATERIALS		CSH-55 カラースキニングソナー COLOR SCANNING SONAR (CSH-551 送信装置 TRANSMITTER)			
番号 No.	名称 NAME	略図 OUTLINE	型名 / 規格 DESCRIPTIONS	数量 Q'TY	用途 / 備考 REMARKS
1	コネクタコンタクト CONNECTOR CONTACT PIN		60-8017-0313-00-339 CODE NO. 000-519-542	6	
2	コネクタ CONNECTOR		54-038-525-601/SC CODE NO. 000-132-075	3	
3	圧着端子 CRIMP-ON LUG		FV5.5-4 # YEL CODE NO. 000-538-123	10	
4	ホールプラグ HOLE PLUG		NO. 4567 CODE NO. 000-800-729	4	
5	貼りマーク STICKER		10-026-5002-0 CODE NO. 100-004-870	1	
6	プラスチック PLASTIC BAND		CV-100 CODE NO. 000-570-322	20	

# FURUNO

C1297-M06-B

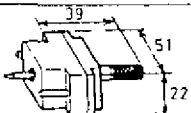
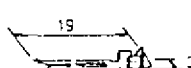

CODE NO		10CF-X-9505-1
TYPE		

工事材料表 INSTALLATION MATERIALS		CSH-55 カラースキャニングソナー COLOR SCANNING SONAR (信号ケーブル SIGNAL CABLE)			
番号 No	名称 NAME	略図 OUTLINE	型名 / 規格 DESCRIPTIONS	数量 Q'TY	用途 / 備考 REMARKS
1	信号ケーブル組品 SIGNAL CABLE ASSY.		S10-10-20(38P) (10S1258-1 *20M*) CODE NO 006-973-780	1	指示装置用 FOR DISPLAY UNIT
2	信号ケーブル組品 SIGNAL CABLE ASSY.		S10-11-20(38P) (10S1258-1 *20M*) CODE NO 006-973-790	1	受信装置用 FOR RECEIVER UNIT
3	信号ケーブル組品 SIGNAL CABLE ASSY.		S10-12-20(38P) (10S1260-0 *20M*) CODE NO 006-973-800	1	受信装置用 FOR RECEIVER UNIT
4	信号ケーブル組品 SIGNAL CABLE ASSY.		S10-13-5(20P) (10S1261-0 *5M*) CO-SPEV-SB 0.3X6P CODE NO 006-973-810	1	受信装置用 FOR RECEIVER UNIT
5	信号ケーブル組品 SIGNAL CABLE ASSY.		S10-14-20(38P) (10S1259-1 *20M*) CODE NO 006-973-820	1	上下装置用 FOR HULL UNIT

# FURUNO

C1297-M04-C

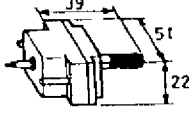
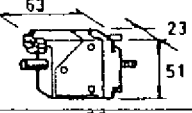
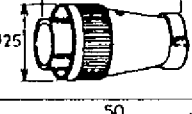
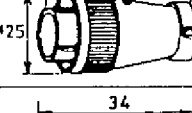
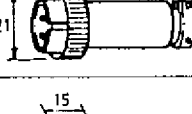


CODE NO	006-972-370	10CF-X-9404-1
TYPE	CP10-03800	

工事材料表 INSTALLATION MATERIALS		CSH-55 カラースキャニングソナー COLOR SCANNING SONAR (CSH-100 リモートディスプレイ用 信号ケーブルセット SIGNAL CABLE SET FOR REMOTE DISPLAY)			
番号 No	名称 NAME	略図 OUTLINE	型名 / 規格 DESCRIPTIONS	数量 Q'TY	用途 / 備考 REMARKS
006-972-360 CP10-03810	1	コネクタ CONNECTOR	 00-8016-038- 313761HV 10S1566-0 CODE NO 000-127-234	2	
	2	コネクタコンタクト CONNECTOR CONTACT PIN	 60-8017-0313-00- 339 CODE NO 000-519-542	4	
	3	複合37芯ケーブル 37C CABLE		10S1258-1 * ( ) M VV-SB 12/0.18X1SB C 12/0.18X18PSB CODE NO 000-101-006	1

# FURUNO

C1297-M07-A

CODE NO	006-935-300
TYPE	CS-120-C

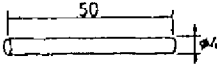
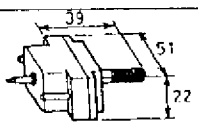
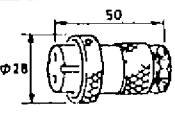
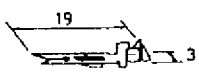
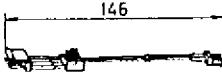
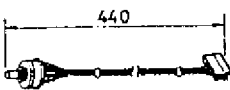
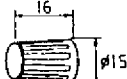


工事材料表 INSTALLATION MATERIALS		CSH-55 カラースキャニングソナー (CS-120A COLOR SCANNING SONAR 外部インタフェイス EXTERNAL INTERFACE)			
番号 No	名称 NAME	略図 OUTLINE	型名 / 規格 DESCRIPTIONS	数量 QTY	用途 / 備考 REMARKS
1	コネクタ CONNECTOR		00-8016-038-313761HV 10S1566-0 CODE NO 000-127-234	1	
2	コネクタ CONNECTOR		00-8016-038-313-751V CODE NO 000-519-543	1	
3	コネクタ CONNECTOR		SRCN6A16-10P CODE NO 000-508-663	4	
4	コネクタ CONNECTOR		SRCN6A16-7P CODE NO 000-508-662	1	
5	コネクタ CONNECTOR		RM15TP-2PA CODE NO 000-503-314	1	
6	貼りマーク(J201) STICKER (J201)		10-018-5022 CODE NO 181-850-220	1	
7	アース線組品 GROUNDING WIRE		IV-8.0SQ 7x *5M* BLU CODE NO 006-937-990	1	



# FURUNO

C1297-M03-B

CODE NO	000-069-542	10CF-X-9403-1
TYPE	CP10-03900	

工事材料表 INSTALLATION MATERIALS		CSH-55 カラー スキャニングソナー COLOR SCANNING SONAR (CSH-556 副指示器用 FOR SUB DISPLAY UNIT)			
番号 No	名称 NAME	略図 OUTLINE	型名 / 規格 DESCRIPTIONS	数量 QTY	用途 / 備考 REMARKS
006-973-830 CP10-03910	1 イラックスチューブ INSULATION TUBE		4MMX5CM * YEL CODE NO 000-100-923	1	
	2 コネクタ CONNECTOR		00-8016-038- 313761HV CODE NO 000-127-234	1	
	3 コネクタ CONNECTOR		NCS-252-P CODE NO 000-506-501	1	
	4 コネクタコンタクト CONNECTOR CONTACT PIN		60-8017-0313-00- 339 CODE NO 000-519-542	4	
006-955-660 CP10-00421	5 改造部品1.組品 CONNECTION CABLE W/VH-4P-4P-2P		CP10-00422 CODE NO 006-955-670	1	
	6 改造部品2.組品 ROTARY SWITCH W/NH-15P		CP10-00423 CODE NO 006-955-680	1	
	7 ノブ KNOB		021-3420 CODE NO 000-515-315	1	組立て出荷 ASSEMBLED WHEN SHIPPING
	8 キャップ CAP		040-3020 CODE NO 000-515-323	1	
9 信号ケーブル組品 SIGNAL CABLE ASSY.		S10-10-20(38P) (10S1258-1 *20M*) CODE NO 006-973-780	1		

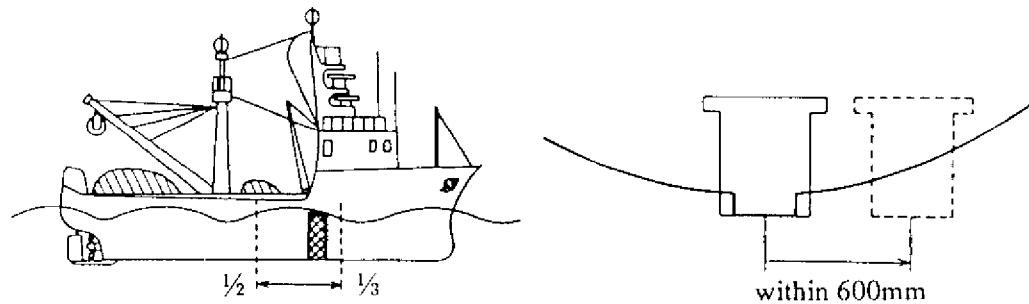
# MOUNTING

## 1.1 Hull Unit

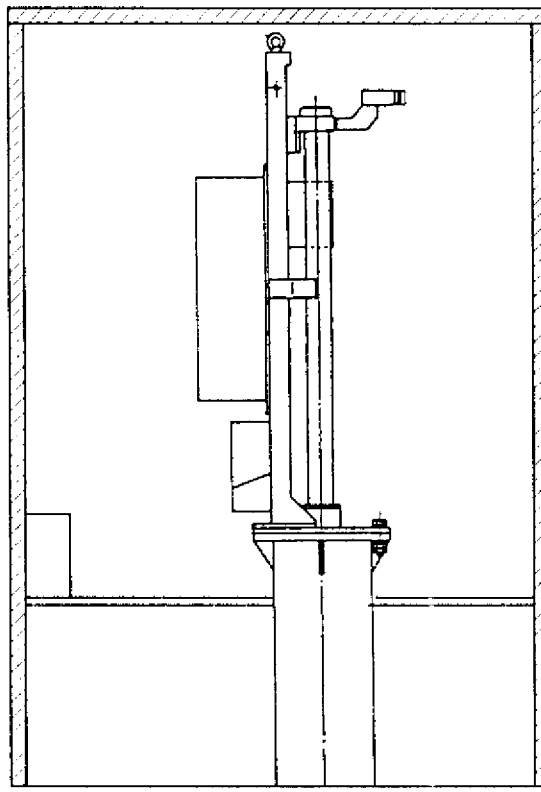
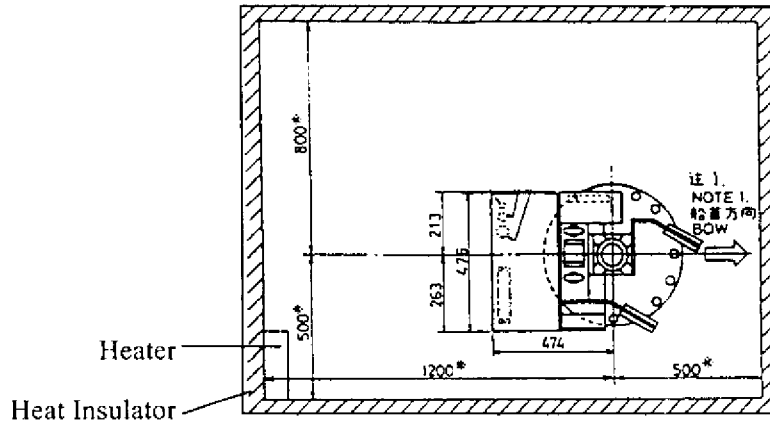
### Installation position of hull unit

Discussion and agreement are required with the dockyard and the ship owner in deciding the installation position of the hull unit. When deciding the installation position, the following points should be taken into account.

- 1) Select an area where propeller noise, cruising noise, air bubbles and interference from turbulence are at a minimum. Generally, the point at  $1/3$  to  $1/2$  of the ship's length from the bow on or near the keel is optimum. On-the-keel installation is advantageous for minimizing oil consumption in comparison with off-the-keel. If the hull unit can not be installed on the keel, the center of the retraction tank should be within 600mm of the keel so as to prevent a rolling effect.



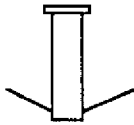
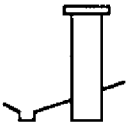
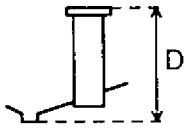
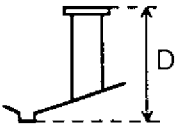
- 2) Select a place where the hull bottom is flat and the draft is sufficiently deep. Normally, the transducer should protrude at least 500mm beyond the keel to minimize the effect of air foam and bubbles.
- 3) Select a place where interference from other equipment is minimal. The hull unit should be at least 2.5m away from the transducers of other equipment.
- 4) No obstacle should be in the fore direction since it causes a shadow zone and aerated water, resulting in poor sonar performance.
- 5) The following space shown in the diagram on the next page is required around the hull unit for wiring and maintenance. If the ambient temperature of the unit is below  $0^{\circ}\text{C}$ , the sonar compartment must be provided with a heater so as to keep the temperature above  $0^{\circ}\text{C}$ .



Example of Sonar Compartment

## Installation of retraction tank

The retraction tank is 900mm in length when supplied. Shorten the tank as necessary so that the transducer is placed well below the keel level when it is lowered. The following table provides guidelines for shortening the tank. Refer also to page D-8 for detailed tank installation method.

Installation Method				
XDCR Travel				
800mm	Remove 0 thru 220mm from the bottom.	Same as left	Remove 0 thru 220mm from the bottom. Note that the length "D" must be less than 1180mm.	Same as left
1200mm	Remove 0 thru 50mm from the bottom.	Same as left	Remove 0 thru 50mm from the bottom. Note that the length "D" must be less than 1750mm.	Same as left

*Note 1. In the 800mm type hull unit, when 220mm is removed and "D" is minimum, the effect of air foam is minimized when the transducer is fully protruding in water.*

*2. In the 1200mm type hull unit, when 50mm is removed and "D" is minimum, the effect of air foam is minimized when the transducer is fully protruding in water.*

### Installing hull unit on retraction tank

After welding the retraction tank and allowing sufficient time for cooling, install the hull unit by the following procedure.

- 1) Clean both the O-ring and O-ring groove and apply a slight amount of grease. Place the O-ring in position on the tank flange.
- 2) Place the gasket (1) on the bolt holes of the tank flange.
- 3) Orient the hull unit so that the HEAD mark on its flange points toward the ship's bow. Note that heading adjustment in the display unit is required if the HEAD mark does not face the ship's bow.

4) In case of the 1200mm transducer travel type, of the 24 bolt holes on the hull unit flange, eleven holes have already been fitted with bolts. Insert the gasket (2) into the bolt holes of the tank flange to which these eleven bolts are fitted. Note that it is difficult to fit them after the hull unit has been placed on the tank.

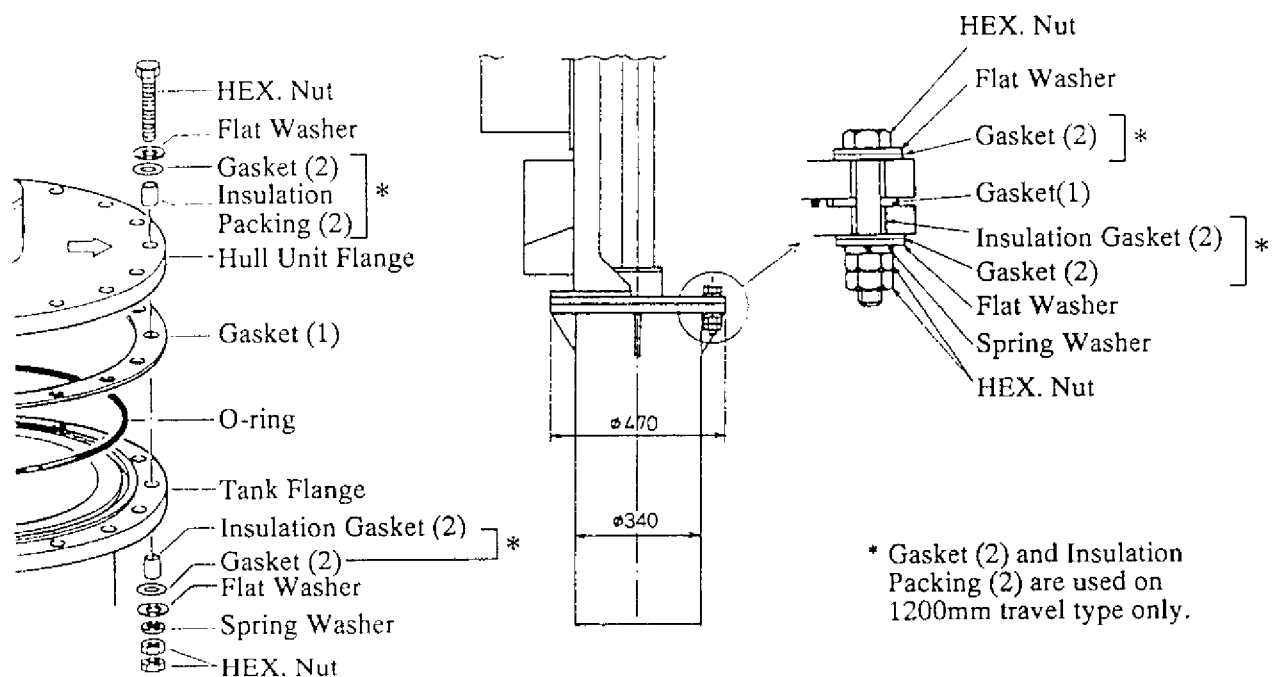
5) Place the hull unit on the tank, taking the following points into account.

- \* The flange surface should be cleaned beforehand.
- \* The O-ring and the insulation gasket (1) should be in position.

6) Fit the insulation gasket (2) into the bolt holes of both the tank and hull unit flanges, and then secure the two flanges by using the gasket (2), flat washers, spring washers and hex. bolts. (Insulation gasket (2) and gasket (2) are used for 1200mm transducer travel type only.)

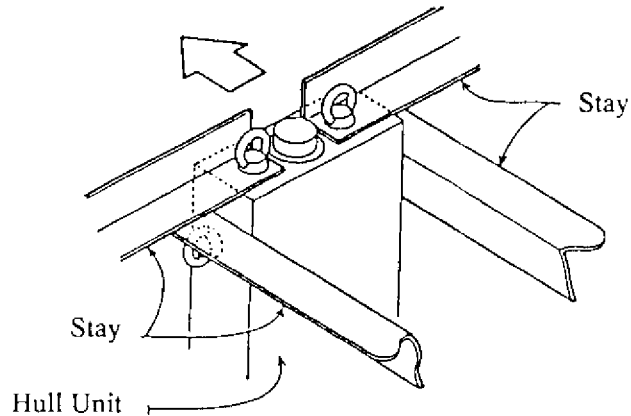
**NOTE:** Coat every bolt, washer and nut with slight amount of grease to ease removal at future service work.

7) Reinforce the hull unit against vibration by extending the stays to the ship's hull from the two eyebolts on top of the hull unit, referring to figure at the top of the next page.

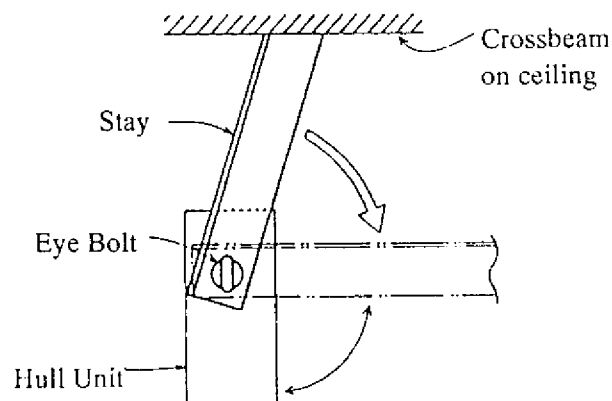


## Measures against vibration

Install the stays from the top of the hull unit to the ship's hull. The stays should be angle iron with a size of 75x75x9mm or more and at least two pieces should be used; one each to ship's bow and stern directions. Install if possible, two more stays in ship's transverse direction.



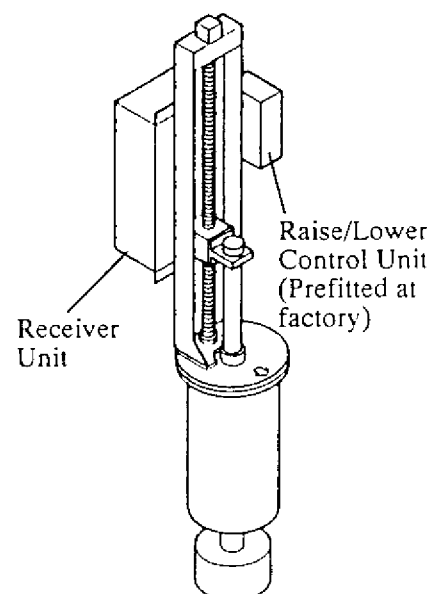
Do not install the stays as shown below. Vibration-resistance effect is reduced since vibration is applied to the stays as rotation force. Install them horizontally.



## Mounting receiver unit on hull unit

Mount the receiver unit on the left side of the hull unit as shown at right.

*Note: A transducer cable protection cover has been fitted on the receiver unit mounting location of the hull unit. Remove it when mounting the transceiver unit.*



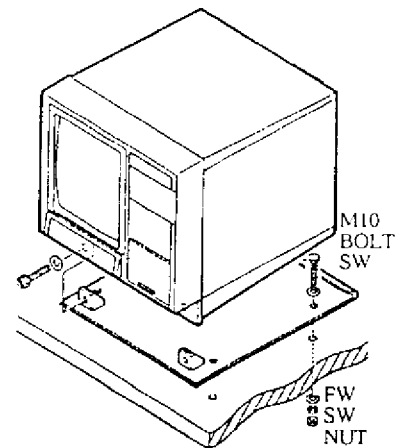
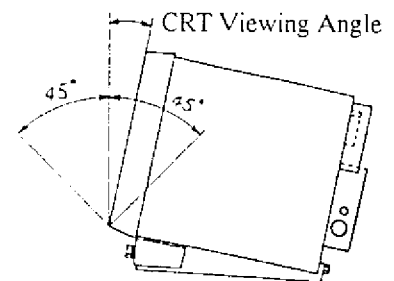
## 1.2 Display Unit

The display unit, which is designed for tabletop mounting, can be installed in any well ventilated location in the steering house, provided that the following conditions are met.

- 1) Place where operating personnel are able to control the unit easily while observing the fishing ground or the area surrounding the vessel.
- 2) Place at least 1m away from magnetic components (radar magnetron, loudspeaker, high power transformer, etc.) and magnetic compass.
- 3) Place not exposed to direct sunlight, water splashes or hot air.
- 4) Place where maintenance and ventilation clearance shown in the outline drawings is ensured.
- 5) Place where the CRT face is within  $\pm 45^\circ$  from vertical.

### Mounting

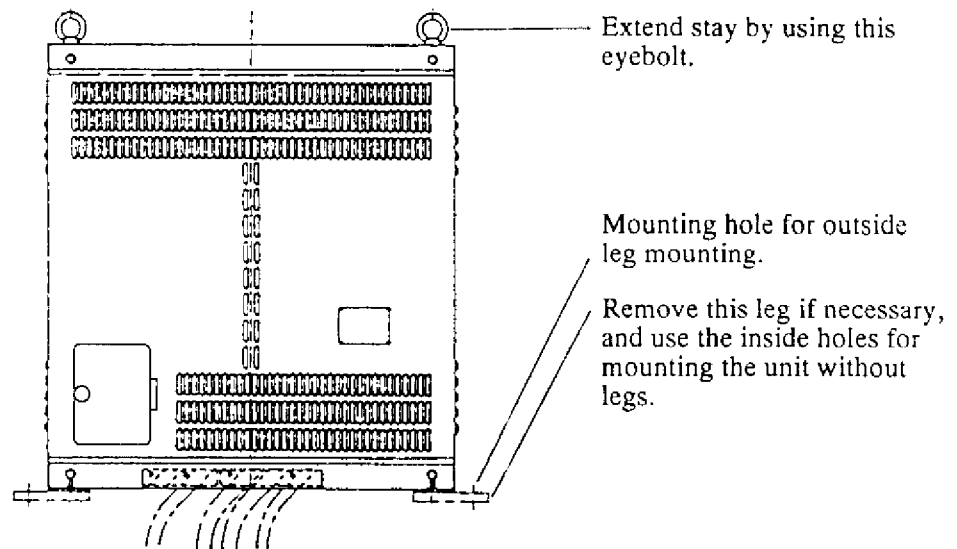
1. Remove the mounting base by loosening the two bolts at the front bottom.
2. Fix the mounting base onto the table by using four M10 bolts, flat washers, spring washers and nuts. It is recommended that a rubber mat be placed under the mounting base to reduce vibration.
3. Fasten the unit to the mounting base with two bolts. When the space around the unit is limited, make wirings to the display unit first and then fasten the unit.



## 1.3 Transmitter Unit

The transmitter unit can be mounted with or without mounting legs. For use of no mounting legs remove them and use inside mounting holes.

The transmitter unit should be reinforced against vibration by stays extending from the eyebolts on the top of the unit.




#### 1.4 Interface Unit (option)

Since the interface unit connects with several navigation and fishing equipment, determine the installation site with the wirings to them taken into account. In addition, since the unit incorporates a data selector and self-check switch, select a place where they can be easily operated .




## 1.5 Grounding

Since all units are very sensitive to noise, they should be grounded with suitable copper strap or ground wire. The ground terminal of each unit is shown below.



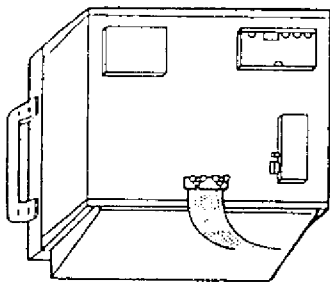
# CAUTION



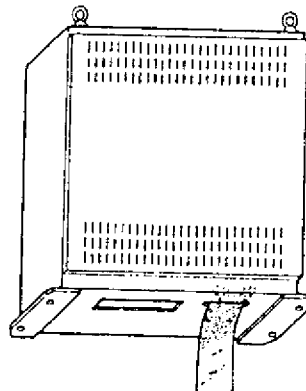
**Ground the equipment.**

Ungrounded equipment can give off or receive electromagnetic interference or cause electrical shock.

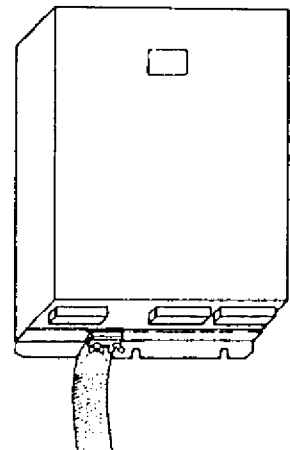
Display Unit



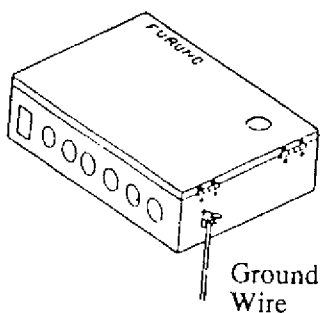
Transmitter Unit



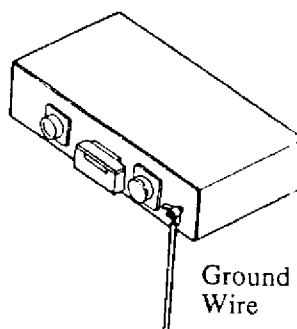
Receiver Unit



Interface Unit



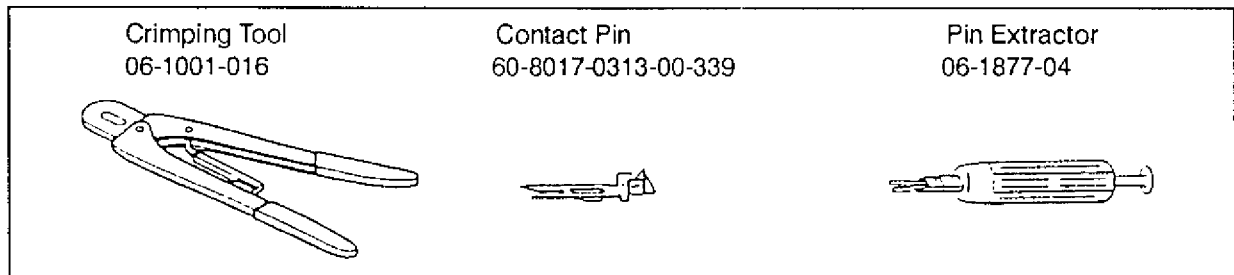
FNZ Joint Box



# WIRING

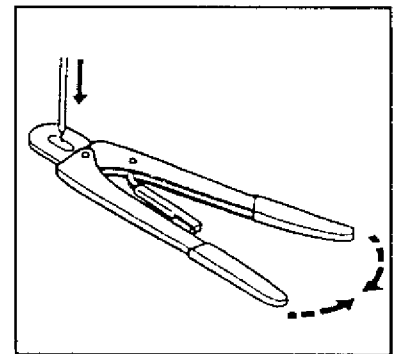
## 2.1 Crimping Tool and Crimping Method

A special crimping tool is necessary for connection of wires to the contact pins of the 38P connector. Also a pin extractor should be used to remove the contact pin from the connector body. The following describes how to crimp and extract the contact pin.



### Wire crimping procedure

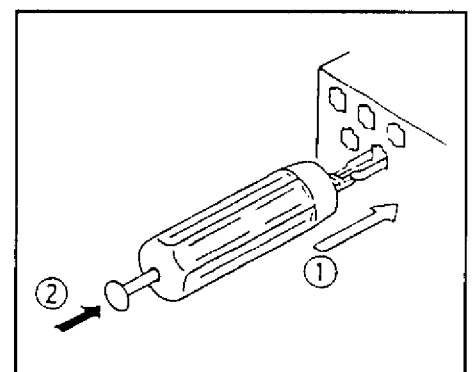
- 1) Strip the vinyl sheath of the wire to expose the core by 3.2mm to 4mm.
- 2) Hold the crimping tool horizontally and insert the contact pin with its slit facing downward into the crimp hole on the crimping tool.
- 3) Insert the wire onto the contact pin and squeeze the handle until the ratchet releases. The wire should be placed deep enough into the contact pin so that its end comes in contact with the stopper plate of the crimping tool. With crimping completed, pull the wire while holding the contact pin to make sure that it is fastened tightly.



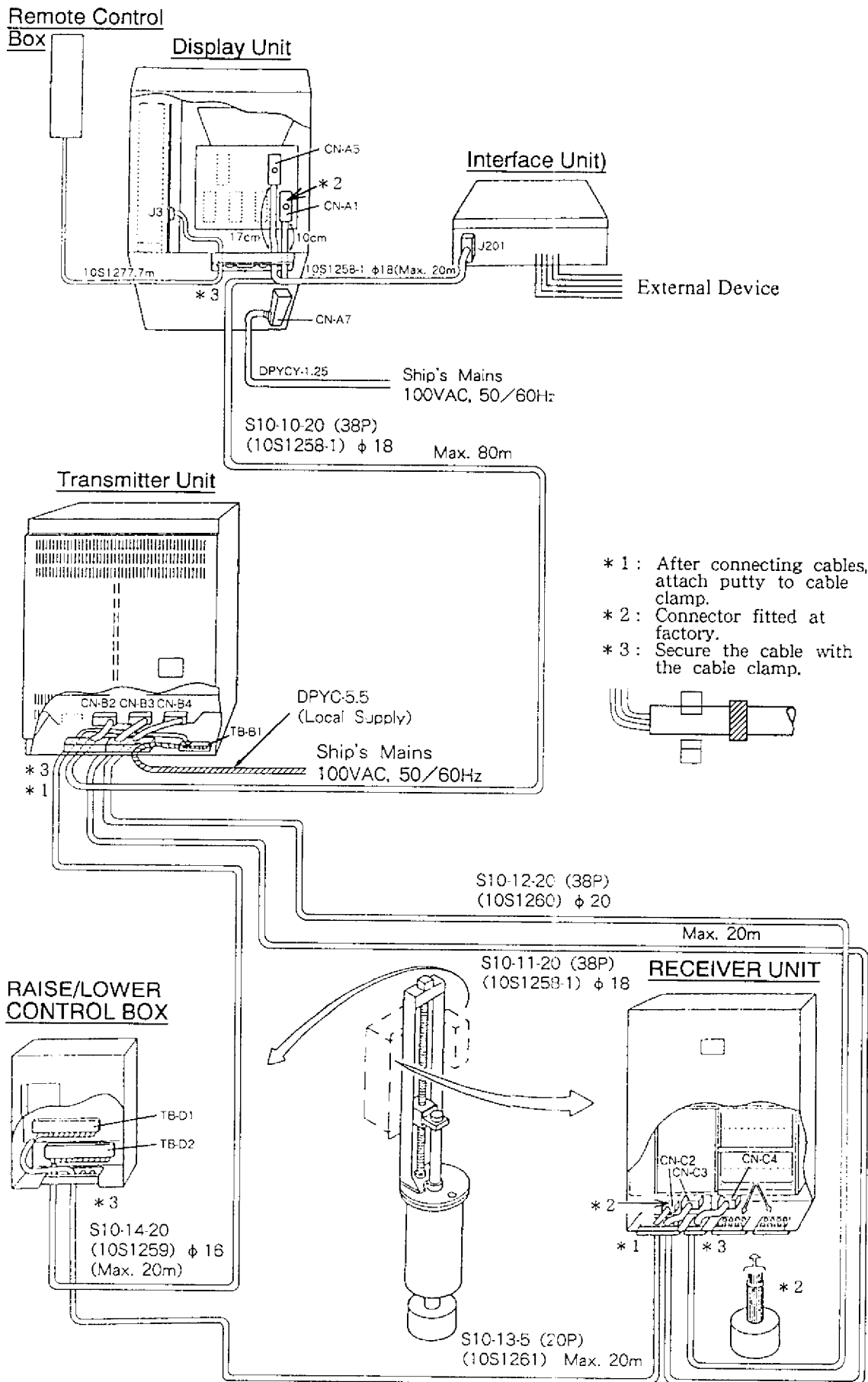
### Procedure to extract contact pin

If a contact pin is inserted into an incorrect hole on the connector body, remove it by using the pin extractor.

- 1) Push the pin extractor into the pin hole from the side opposite to the pin inserting side.
- 2) Push in the head of the pin extractor. The retaining spring comes free and the contact pin can be removed.

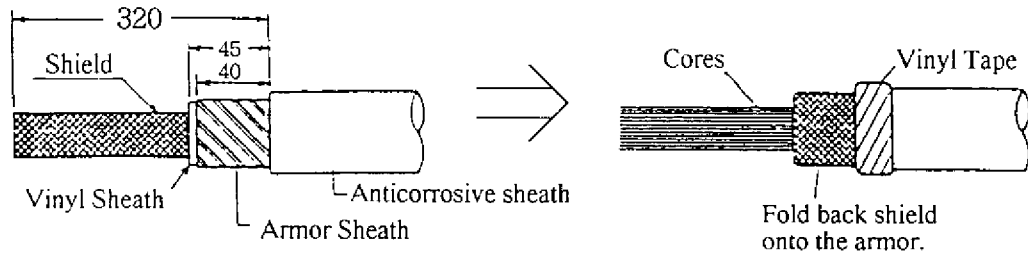


## 2.2 Connector/Terminal Board Location



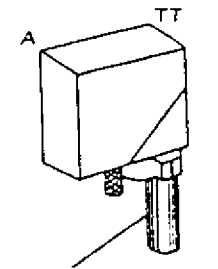
## 2.3 Connector Assembling in Transmitter Unit

### 38P Connector (54-038-525-601/SC)

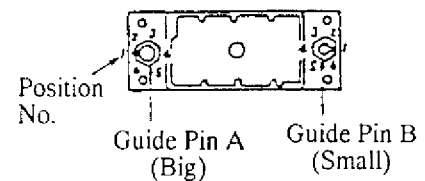
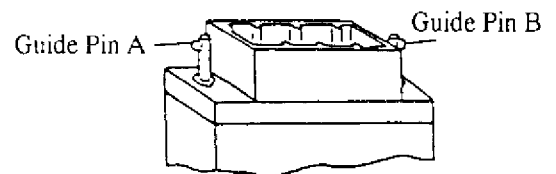
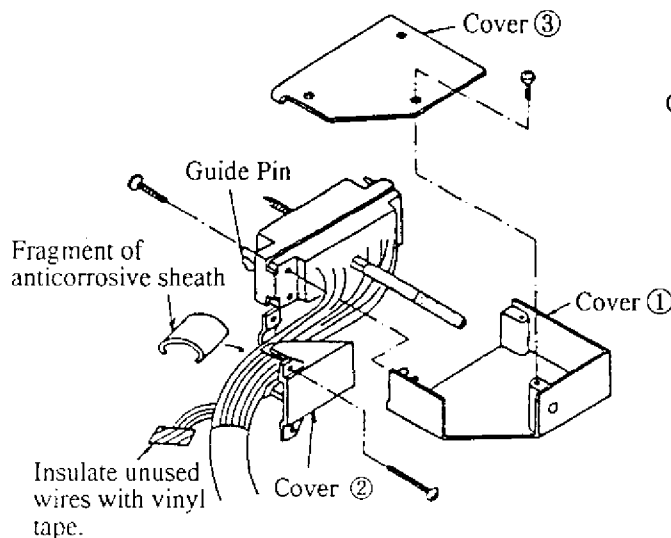


#### Assembling the connector

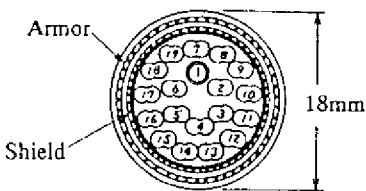
1. Bundle unused wires outside the connector case.
2. Fix the cover 1, noting the cable out-going direction.
3. Dress the wires and fix the covers 2 and 3. Use a fragment of cable sheath to secure the wires at the connector clamp.
4. Shorten unused wires and wrap their ends with vinyl tape to prevent short-circuiting.



Cable Outgoing Direction



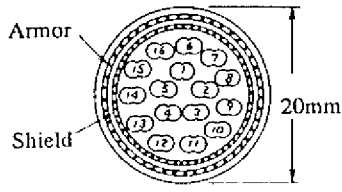
**S10-11-20 (38P)**  
[10S1258-1]



Armor  
Shield  
18mm

NO.	COLOR	NO.	COLOR	NO.	COLOR
2	BLK/BRN	8	BLK/PPL	14	BRN/GRN
3	BLK/RED	9	BLK/GRY	15	BRN/BLU
4	BLK/ORG	10	BLK/WHT	16	BRN/PPL
5	BLK/YEL	11	BRN/RED	17	BRN/GRY
6	BLK/GRN	12	BRN/ORG	18	BRN/WHT
7	BLK/BLU	13	BRN/YEL	19	RED/ORG

**S10-12-20 (38P)**  
[10S1260]

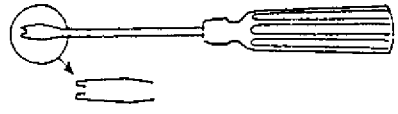


Armor  
Shield  
20mm

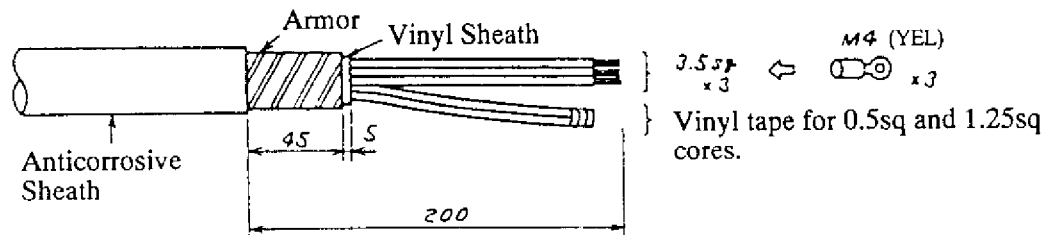
NO.	COLOR	NO.	COLOR	NO.	COLOR
1	YEL/BLK	7	RED/WHT	13	YEL/PPL
2	BLU/BLK	8	GRN/WHT	14	BLU/PPL
3	RED/BLK	9	YEL/GRY	15	RED/PPL
4	GRN/BLK	10	BLU/GRY	16	GRN/PPL
5	YEL/WHT	11	RED/GRY		
6	BLU/WHT	12	GRN/GRY		

### Positioning guide pins

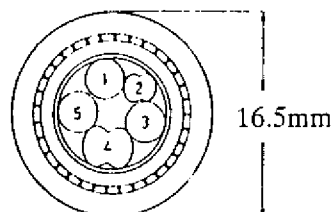
Guide pins of the connector are used to identify the mating receptacle and should be positioned as below.

Connector	CN-B2	CN-B3	CN-B4	Positioning Tool  Type: 10-910-0179-0
Guide Pin				
Guide Pin A (Large)	1	1	3	
Guide Pin B (Small)	1	1	1	

### **Fabrication of cable S10-14-20 (10S1259)**



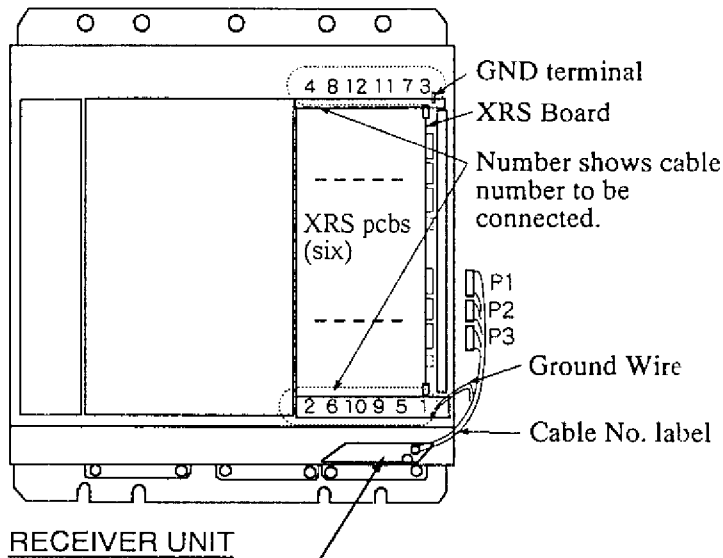
**S10-14-20**  
[10S1259-1]



NO.	COLOR
1	WHT
2	WHT/RED
3	RED
4	BRN/BLK
5	BLK

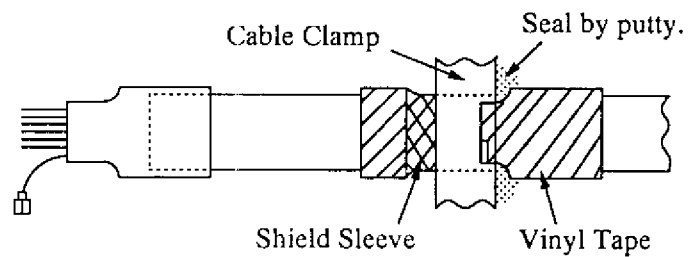
## 2.4 Connection of Transducer Cable

The transducer cables are prefitted with connectors. Plug them into the receptacles, referring to the stickers on the cables.



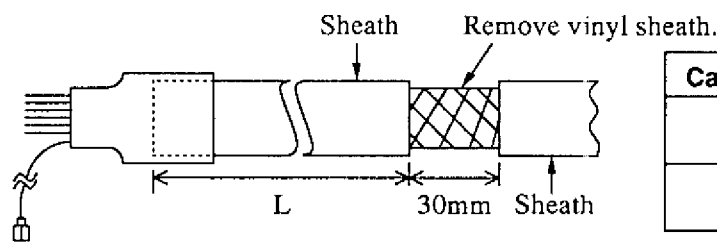
- 1) Connect transducer cables to XRS board terminal by referring to labels inside the receiver unit.
- 2) Connect ground wires to GND terminal.
- 3) Fix cables to fixing plate on the XRS board or chassis.

The illustration at right shows completed fabrication of cable.



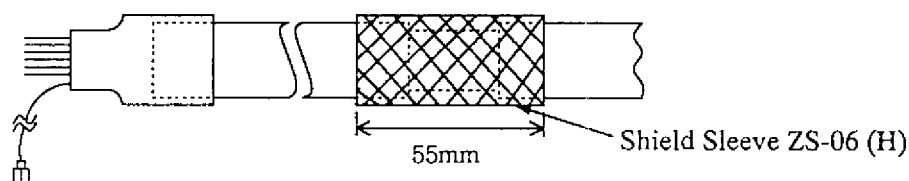
Cables may not have been fabricated on initial sets. Fabricate them as follows:

1. Remove vinyl sheath by referring to the table below.



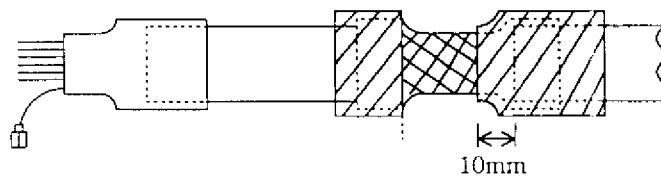
Cable number	L(mm)
1, 5, 9	90
2, 6, 10	90
3, 7, 11	220
4, 8, 12	220

2. Insert shield sleeve from the connector side as shown below.

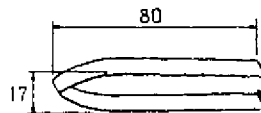


Continued on next page

3. Wrap both ends of the sleeve with vinyl tape.



*Note: 1. Use the connector puller (supplied) whenever unplugging connectors.*

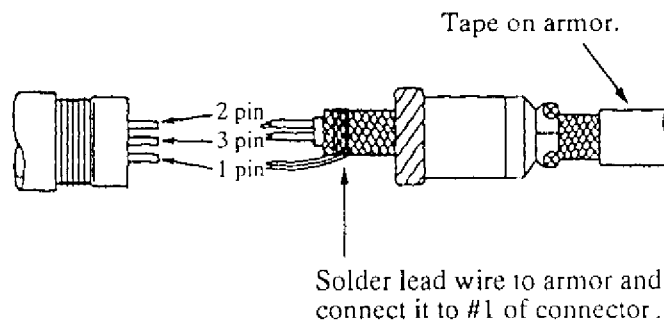


*2. When one or some of the lead wires are disconnected near a connector, cut off all lead wires connected to the connector and solder the "XH connector assembly" (supplied as spare parts) to cable.*

## 2.5 Fitting Power Supply Cable Connector

The transmitter unit is shipped ready for connection to ship's mains of 100VAC, 110VAC or 220VAC. For 110/115/200/220/230VAC, change transformer taps as shown below.

The display unit is designed for 100VAC operation only. For 110VAC or 220VAC, use step-down transformer PT-400 (optional supply).

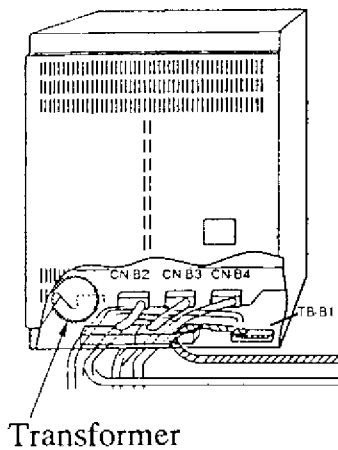


## 2.6 Alteration of Power Supply on Transmitter Unit

The transmitter unit is shipped ready for connection to ship's mains of 100VAC, 110VAC or 220VAC. For 110/115/200/220/230VAC, change transformer taps as shown below.

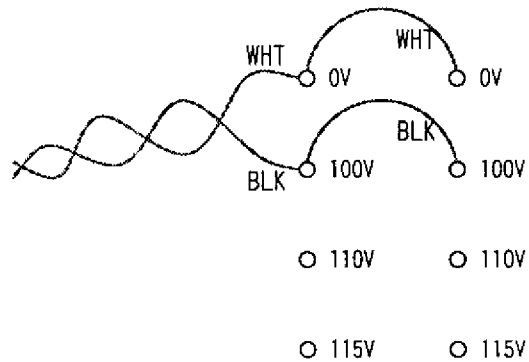
The display unit is designed for 100VAC operation only. For 110VAC or 220VAC, use step-down transformer PT-400 (optional supply).

### Transmitter Unit

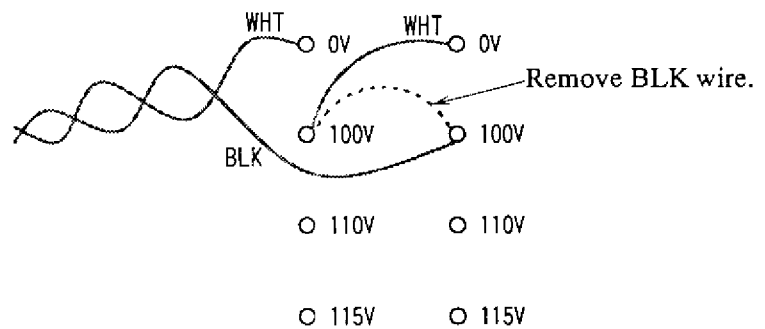


### For 100VAC (Prefitted at factory)

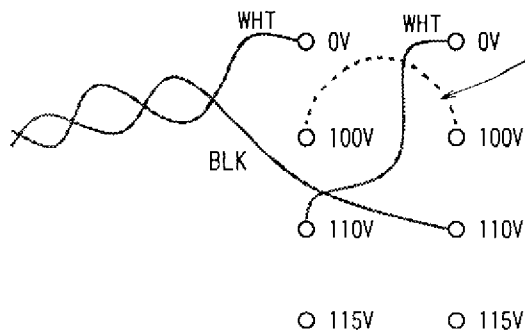
#### Transformer taps



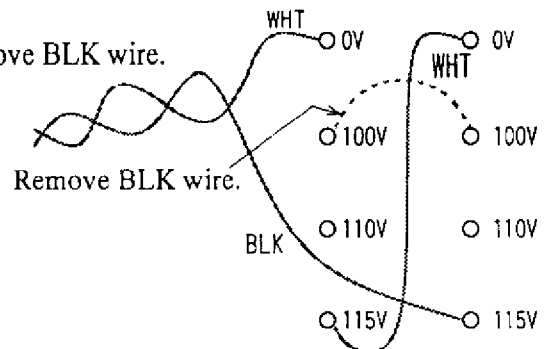
### For 200VAC



### For 220VAC



### For 230VAC



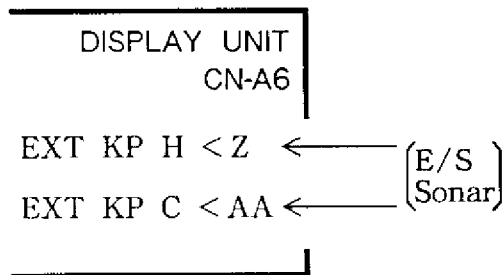


## 2.7 Synchronize Transmission with Other Sonars/Echo Sounders

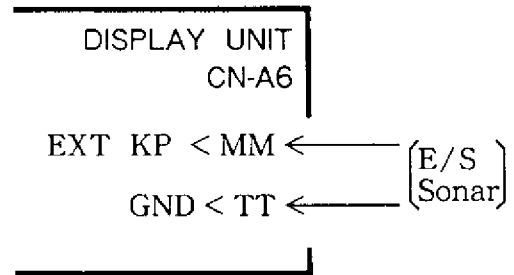
To synchronize the transmission of CSH-55 series sonars to that of other sonar or echo sounders, do the following.

### Wiring

a) For current driven KP

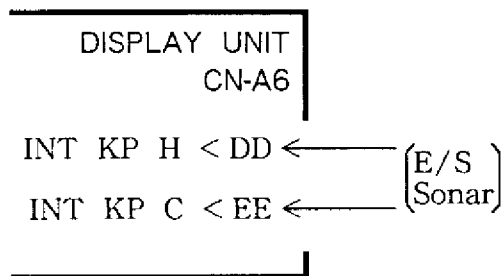


b) For voltage driven KP

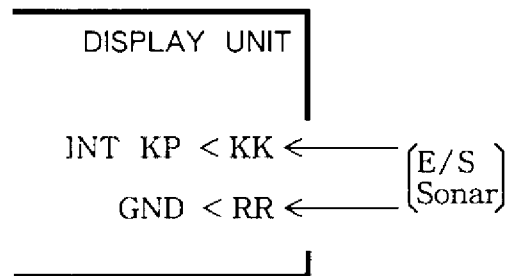


*Note: To output KP to other sonar or echo sounder, do the following.*

a) Current driven KP output



b) Voltage driven KP output



# CONNECTION OF INTERFACE UNIT

If the CSH-55 sonar is combined with nav sensor (via Interface Unit CS-120A (optional supply)) and fishing equipment, its function is expanded to include true motion presentation, echo sounder picture, FNZ marker presentation, etc. This chapter provides the methods of interfacing the CSH-55 sonar with other equipment and wiring details.

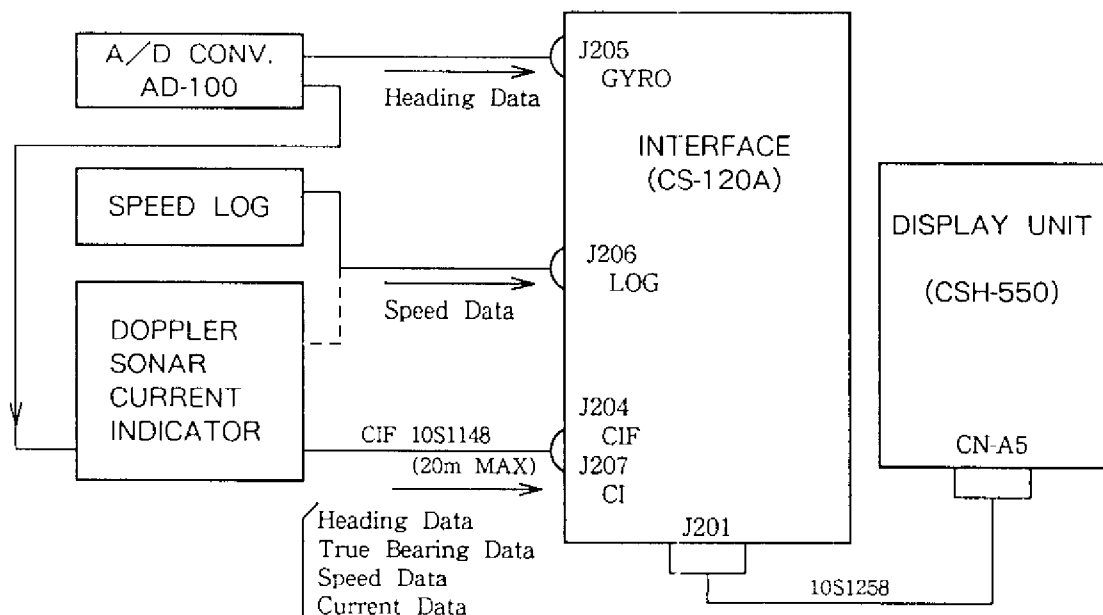
## 3.1 Connections for True Motion and Target Lock Function

Ship's heading data (digital) and speed data (200 pulses/nm) are required to provide the true motion and target lock functions. Both data are fed to the display unit via Interface Unit CS-120A.

Basically, there are two methods to feed the data;

- 1) Ship's heading data is fed to J205 from A/D converter AD-100 and the ship's speed data to J206 from the electromagnetic speed log.
- 2) Both ship's heading and speed data are fed to J207 from the CIF line of the CI-30/50/60.

Select either of the methods depending on the equipment installed. When both methods are available, it is recommended to connect both and select one by the DIP switch inside the CS-120A.



*Note 1. AD-100 outputs two types of data. Do not use data for radars (25 ms interval).*

*2. 200 pulses/mile ship's speed data can be taken from a doppler sonar current indicator.*

### 3.2 Connections for Echo Sounder Picture and FNZ Markers

To provide echo sounder picture and FNZ markers, connect echo sounder to J203 and net sonde to J202.

The signals applied to J202 and J203 are;

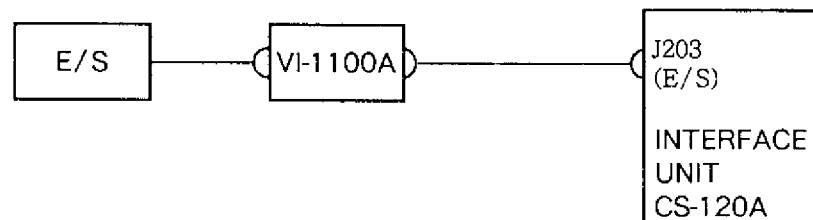
J202: Net sonde signal and trigger signal (keying pulse of echo sounder).

A white line signal from the echo sounder may be additionally applied as described on page 24 if the digital depth data is not available on J204.

J203: Echo signal and keying pulse from an echo sounder

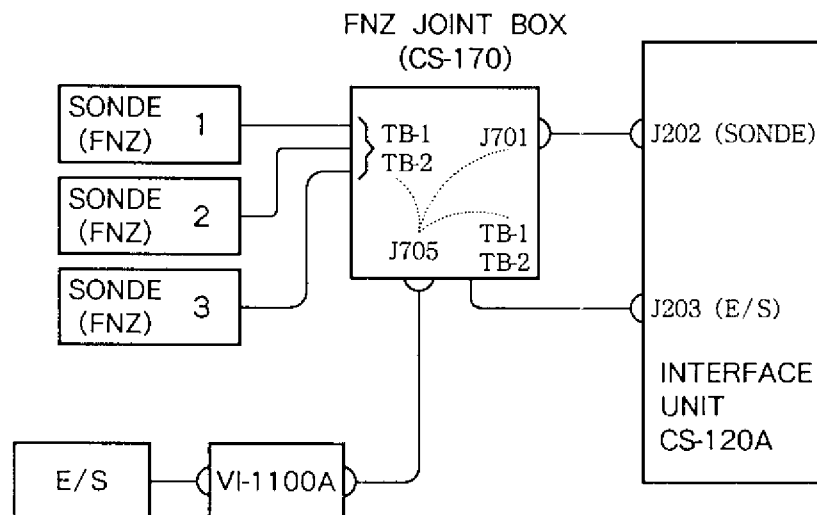
#### Method 1

Displaying echo sounder picture.



#### Method 2

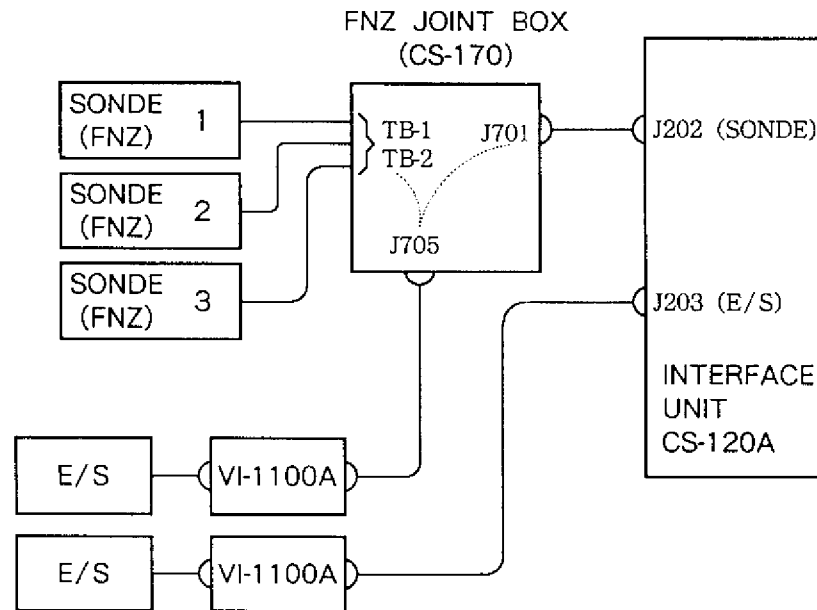
Displaying echo sounder picture and FNZ marker by one echo sounder



This method is used when the net sonde is installed and both echo sounder and net sonde signals are taken from the same echo sounder. The net sonde signal is applied to both J202 and J203.

### Method 3

Displaying echo sounder picture and FNZ markers by separate echo sounders.

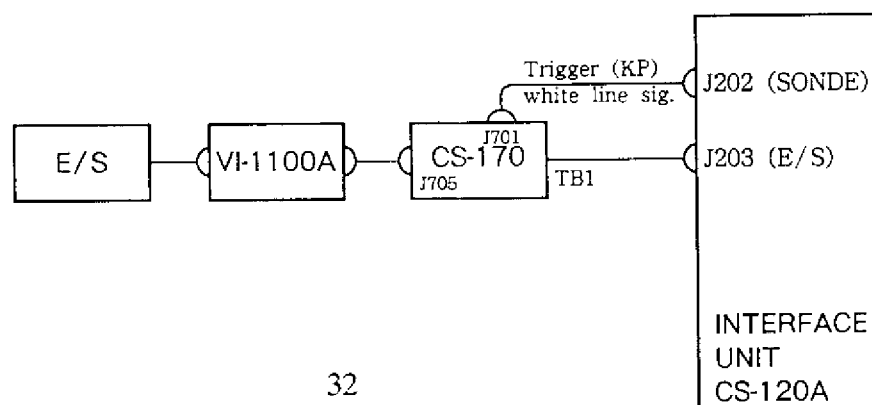


### 3.3 Connections for Digital Readout of Ship's Position, Water Temperature and Depth

The data for these readouts are taken from the equipment shown in the table below and input to J204. When data from multiple equipment are input, use Hybrid Interface IF-5000 to feed the data serially.

Data Name	Data Source
Ship's Position	Loran Navigator, Sat-Nav, GPS Navigator
Water Temperature	Temperature Indicator T-2000/TI-20, Nav-equipment connected to temperature sensor
Depth	Color Video Sounder, Echo Sounder FE-822

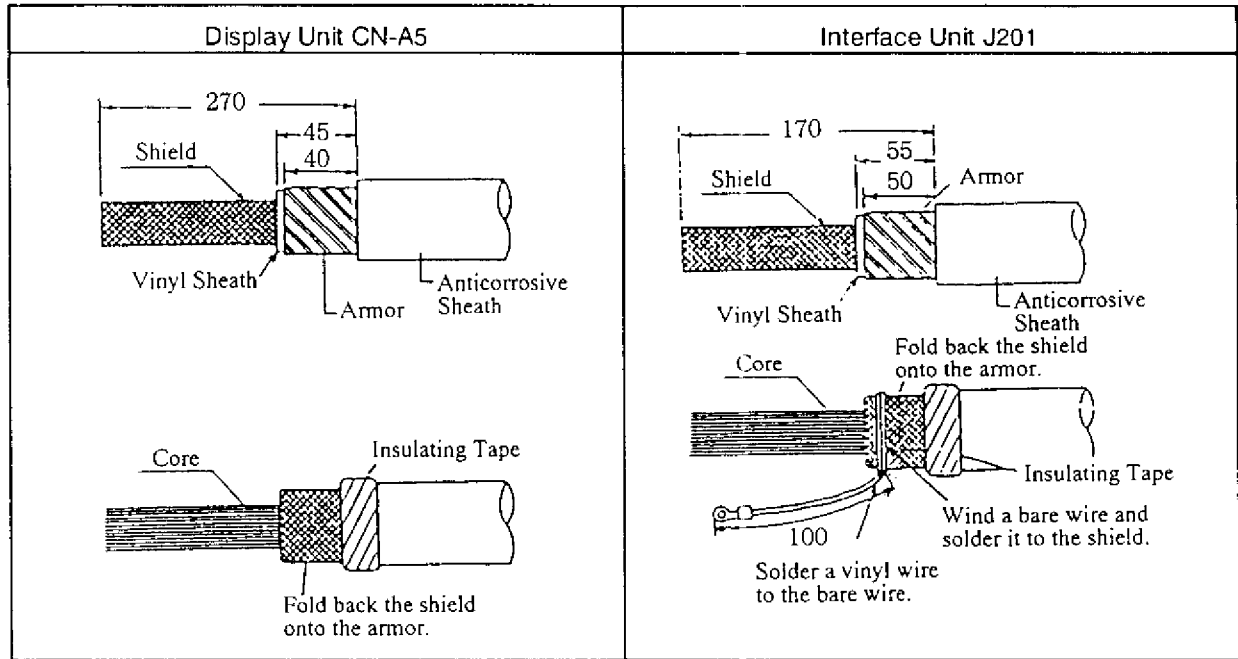
*Note : When a color video sounder which has digital depth data output is not available, the white line signal of a paper recording echo sounder can be used to provide digital depth readout. Connect the echo sounder as shown below or as shown in methods 2 or 3 of para 3-2 and operate the echo sounder front panel controls so that the white line is effected on the seabed contour.*



### 3.4 Wiring

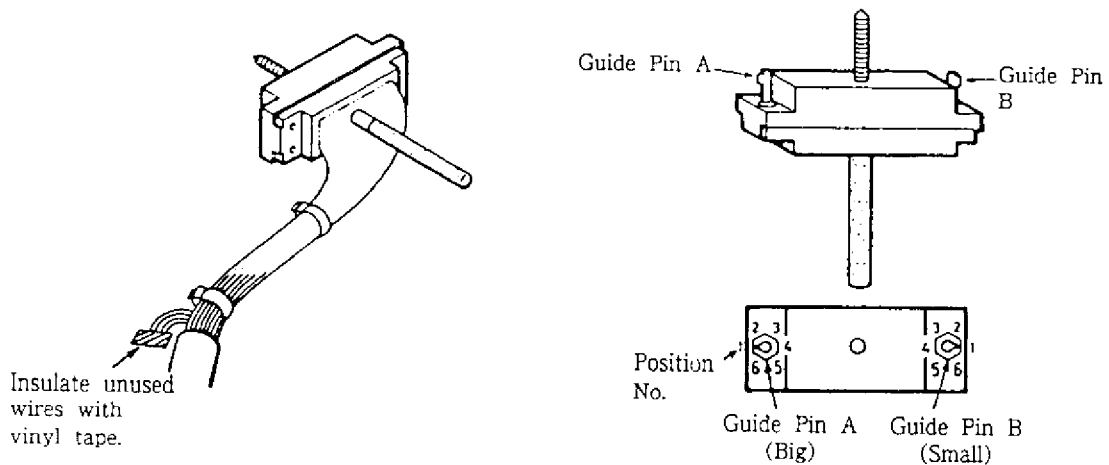
Connect, referring to the Interconnection Diagram on page S-2.

#### Connection with the display unit



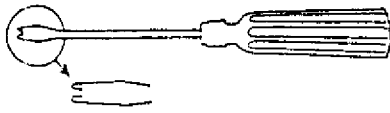
#### Connector

Shorten unused wires and wrap their ends with vinyl tape to prevent short-circuit.



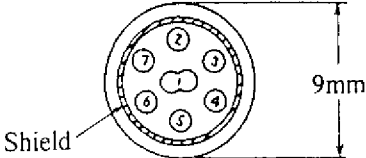
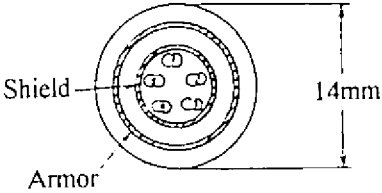
## Positioning guide pins

Guide pins of the connector are used to identify the mating receptacle. Position them as shown in the table which follows.

Connector		Positioning Tool	
Guide Pin	CN-A5	J201	 Type: 10-910-0179-0
Guide Pin A (Big)	5	1	
Guide Pin B (Small)	1	1	

## Connection with external device

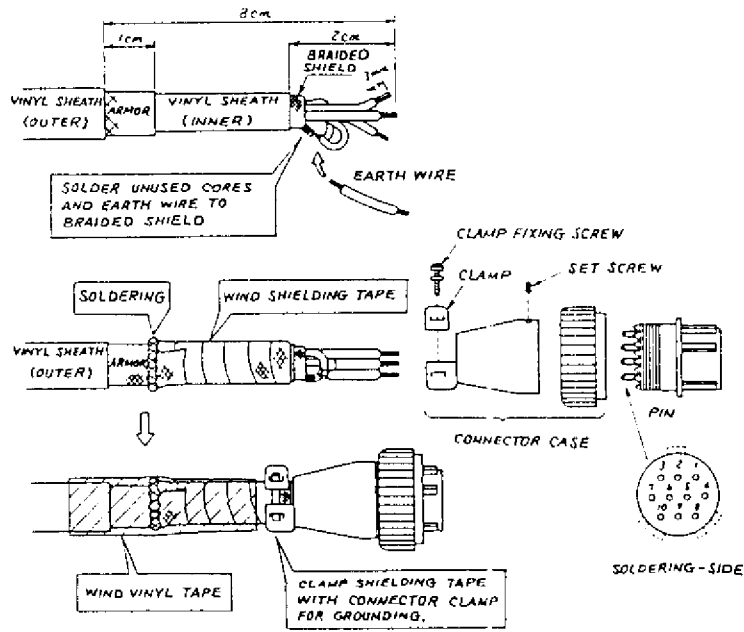
Wire Symbol	Meanings
○	Vinyl Sheath Wire
⊙	Shielded Wire
∞	Twisted Pair Wire

<p>02S8040</p>  <p>Shield</p> <p>9mm</p> <table border="1"> <thead> <tr> <th>NO.</th> <th>COLOR</th> </tr> </thead> <tbody> <tr><td>1</td><td>WHT/BLK</td></tr> <tr><td>2</td><td>BLK</td></tr> <tr><td>3</td><td>PNK</td></tr> <tr><td>4</td><td>GRN</td></tr> <tr><td>3</td><td>ORG</td></tr> <tr><td>6</td><td>YEL</td></tr> <tr><td>7</td><td>RED</td></tr> </tbody> </table>	NO.	COLOR	1	WHT/BLK	2	BLK	3	PNK	4	GRN	3	ORG	6	YEL	7	RED
NO.	COLOR															
1	WHT/BLK															
2	BLK															
3	PNK															
4	GRN															
3	ORG															
6	YEL															
7	RED															
<p>CO-SPEVV-SB-C 0.2sq, 5P</p>  <p>Shield</p> <p>Armor</p> <p>14mm</p> <table border="1"> <thead> <tr> <th>NO.</th> <th>COLOR</th> </tr> </thead> <tbody> <tr><td>1</td><td>YEL/BLK</td></tr> <tr><td>2</td><td>YEL/WHT</td></tr> <tr><td>3</td><td>YEL/RED</td></tr> <tr><td>4</td><td>YEL/BLU</td></tr> <tr><td>5</td><td>YEL/GRN</td></tr> </tbody> </table>	NO.	COLOR	1	YEL/BLK	2	YEL/WHT	3	YEL/RED	4	YEL/BLU	5	YEL/GRN				
NO.	COLOR															
1	YEL/BLK															
2	YEL/WHT															
3	YEL/RED															
4	YEL/BLU															
5	YEL/GRN															

# Cable fabrication/connector assembling

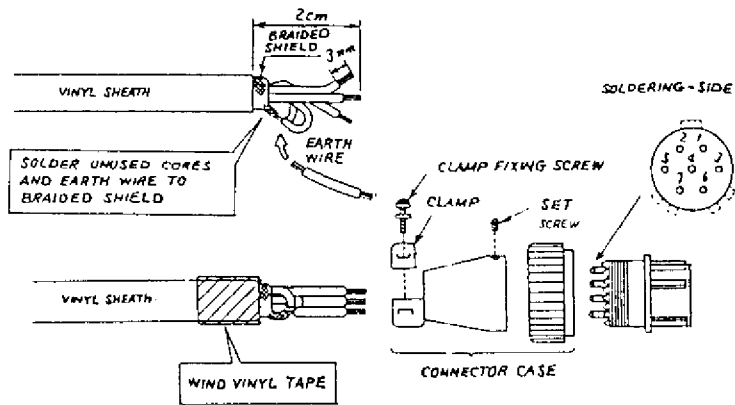
10P Connector (SRCN6A16-10P)

J202 (FNZ), J204 (CIF), J205 (GYRO), J207 (CIF)



7P Connector (SRCN6A16-7P)

J203 (ES)



# ADJUSTMENT AND CHECK

## General

Check all items of the check list on pages 3 to 5. The following explains check and adjustment method.

### 4.1 Wiring Check

TITLE	PAGE
CSH-55 INTERCONNECTION DIAGRAM	S-1
INTERFACE UNIT INTERCONNECTION DIAGRAM	S-2

### 4.2 Ship's Mains Voltage Check

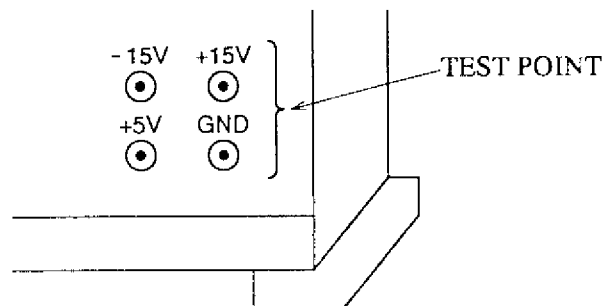
CHECK POINT	RATINGS
Transmitter unit between (1) and (2) of TB-B1	85VAC to 115VAC

Confirm that ship's mains voltage is within ratings during raise/lower operation.

### 4.3 Line Voltage Check

Verify that the following voltages are within ratings with the POWER switches of all units turned on.

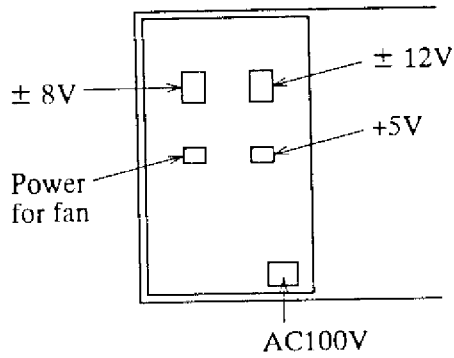
a) Line voltages in the transceiver unit (measured at test points)



Item	Meter reading
+ 5V	(+ 5V ± 0.1V)
+15V	(+15V ± 0.5V)
- 15V	(- 15V ± 0.5V)

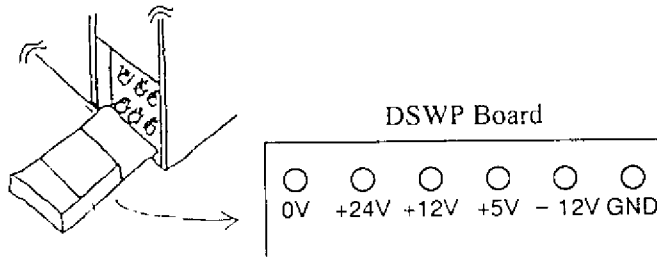


b) Line voltages in the receiver unit (measured at test points)



Item	Meter reading	Check point
+ 5V	(+ 5V $\pm$ 0.1V)	#1 - #4
+ 8V	(+ 8V $\pm$ 0.2V)	#4 - #6
- 8V	(- 8V $\pm$ 0.2V)	#1 - #6
+12V	(+12V $\pm$ 0.5V)	#5 - #7
- 12V	(- 12V $\pm$ 0.5V)	#1 - #4

c) Line voltages in the display unit

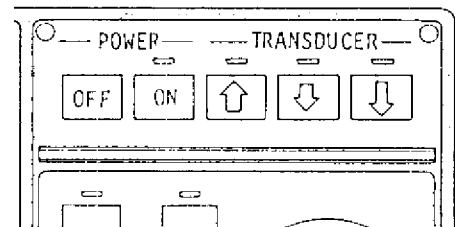


Item	Meter reading
+24V	(22.8 ~ 25.2V)
+12V	(11.5 ~ 12.5V)
+ 5V	( 4.9 ~ 5.1V)
- 12V	(- 11.5 ~ - 12.5V)

Note: For measuring + 24Vdc, use "0V" terminal and for other voltages, use "GND" terminal.

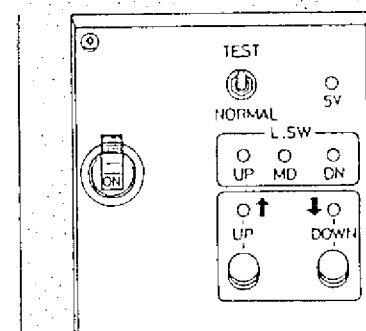
#### 4.4 Check of Raise/Lower Operation

- 1) Press the POWER switch ON to turn on the equipment and check that the LEDs above the ON and "↑" switches light up.
- 2) Check that the "5V" and "UP" LEDs on the raise/lower control box light up.
- 3) Remove the cover of the raise/lower control box and check the following voltages.



#### Display Unit Panel

Terminal Board	Terminal No.	Voltage
TB-D1	7 - 8	+ 12V
TB-D2	1 - 2	100VAC
	2 - 3	100VAC
	1 - 3	200VAC

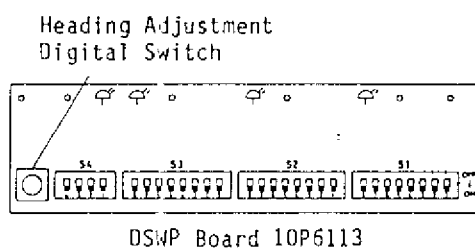
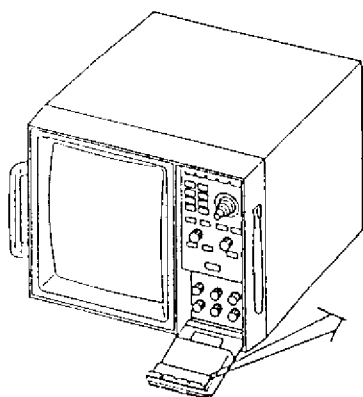


#### Raise/Lower Control Box

- 4) In the raise/lower control box, turn the TEST/NORMAL switch to “TEST” and press the “↓” (lower) switch to check that the transducer lowers. Also check that the “MD” LED lights when the MID limit switch is kicked during lowering. Note that the transducer does not stop at the position of the MID limit switch in the TEST operation.
- 5) Check that the transducer stops whenever the “↓” (lower) switch is released.
- 6) Press the “↓” (lower) switch again to check that the transducer stops at the moment the lower limit switch is kicked.
- 7) Perform the above check also for the raising operation.
- 8) Check that LEDs on the panel of the raise/lower control box light as follows.
  - ① UP, MD and DN LESS of L.SW section on raise/lower control box light while each limit switch is kicked.
  - ② UP and DOWN LEDs on rise/lower control box light while each switch is pressed and extinguish when switch is released.
- 9) After the above check, set the TEST/NORMAL switch to “NORMAL”.
- 10) With the transducer raised, check the raise/lower operation at the display unit.
- 11) Press the “↓” (midpoint) switch to check that the transducer descends to the mid position. Check also that the LED above the “↓” switch flickers while the transducer is moving and lights stationary with a pip sound emitted when it stops at the mid position.
- 12) In the same manner, press “↓” (full) switch and check the operation of the transducer and the LED.
- 13) Press the POWER OFF switch to check that the transducer rises and the equipment is switched off automatically when the transducer is completely retracted.
- 14) Check that the raise operation can be performed with the “↑” switch as well as the POWER OFF switch.

## 4.5 Heading Adjustment

When the BOW mark “⇒” on the flange of the hull unit can not be directed to the ship’s bow because of surrounding objects, the heading adjustment should be performed so that targets in the bow direction are displayed in the 0° direction of the bearing scale.



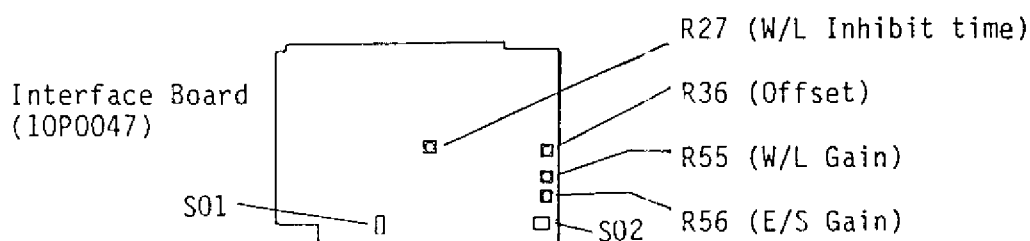
- 1) The heading adjustment can be made by the rotary-type digital switch on the DSWP board (10P6113) at the back of the display unit sub-panel. The picture rotates in 1° steps in the same direction as the rotation of the digital switch. The digital switch can rotate endlessly and the picture rotates accordingly, that is, the picture rotates 360° if the switch is rotated several turns.
- 2) Whenever the digital switch is rotated, a correction value of 0 thru 360 is displayed for about 5 seconds at the top of the screen. It has been set to 0° at the factory and this corresponds to the value when the BOW mark ⇒ is directed toward the ship's bow. Determine the correction value by referring to this. The following table shows the examples of how to determine the correction value.

Hull Unit BOW Mark	Correction Value
Rotated 30° to starboard side	Set correction value to 30
Rotated 30° to port side	Set correction value to 330

- 3) Adjustment should be done with the equipment switched on and the **SONAR** switch set to "1". If the equipment is off, the correction value stored in the memory is not updated even if the digital switch is rotated.

#### 4.6 Interface Unit Adjustment

If the E/S picture on the screen does not have the desired coloration, perform the adjustment as follows with the preset potentiometers on the I/O board in the interface unit.



S02 Mode: Selects the signal mode (AC or DC) according to the combined echo sounder.



S01 FNZ Marker: The FNZ marker is plotted on the echo sounder picture with this switch turned on. Factory setting is in the "ON" position.



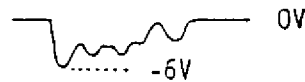
#### Adjustment of signal level (R36, R56)

Prior to adjustment, verify that the output level of the E/S interface (VI-1100A) satisfies the ratings shown at the top of the next page:

### I) For AC INPUT



### II) For DC INPUT



If it doesn't, adjust the potentiometers in the VI-1100A, referring to the FCV series installation manual. S02 is set to the "AC" position at the factory.

#### - Procedure -

- (a) Set the MODE switch to "E/S".
- (b) Turn the E/S gain and E/S offset potentiometers (R56 and R36) so that the color gradation of the E/S picture on the screen appears similar to the intensity gradation of the combined E/S echogram.

Case (A) The E/S picture on the CSH-55 is comparatively higher in sensitivity than that of the paper echogram.

Remedy: Turn E/S offset potentiometer so that weak signals painted in blue or light blue are displayed in deep blue.

Case (B) The E/S picture on the CSH-55 is comparatively lower in sensitivity than that of the paper echogram.

Remedy: Turn the E/S gain potentiometer CW until a picture of even quality is obtained.

#### Adjustment of white line inhibit time (R27)

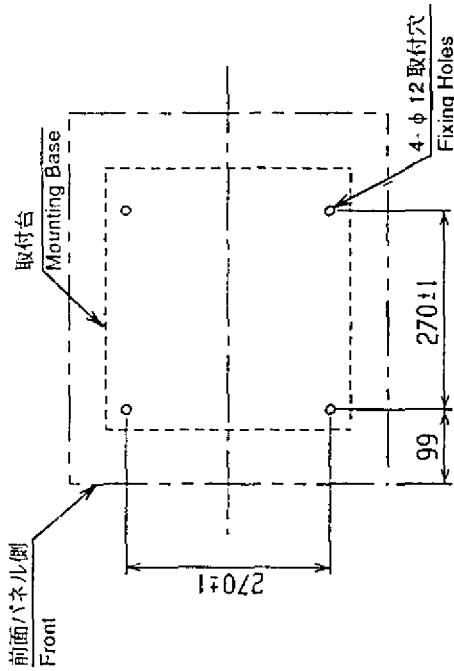
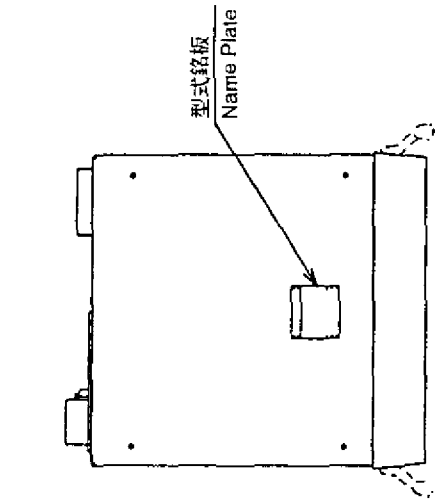
In case digital depth data is not combined with the CS-120A, the white line signal from the echo sounder is used for depth information.

Potentiometer R27 cancels the white line pulse for about 10ms after transmission to avoid false depth indication caused by unwanted noise in short ranges.

Readjustment of potentiometer R27 is not required as long as CSH-55 indicates the correct depth. If it does not, however turn R27 CW about 90 degrees.

#### Adjustment of white line output level (R55)

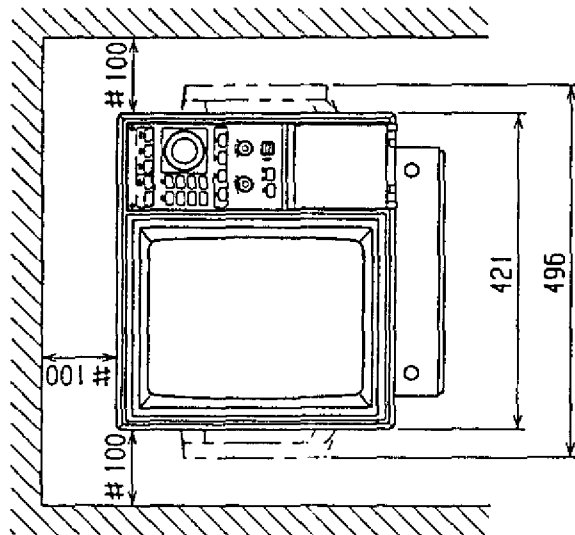
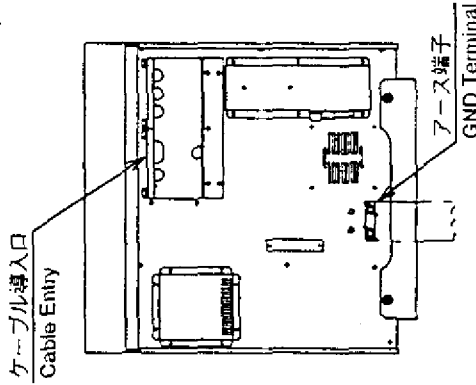
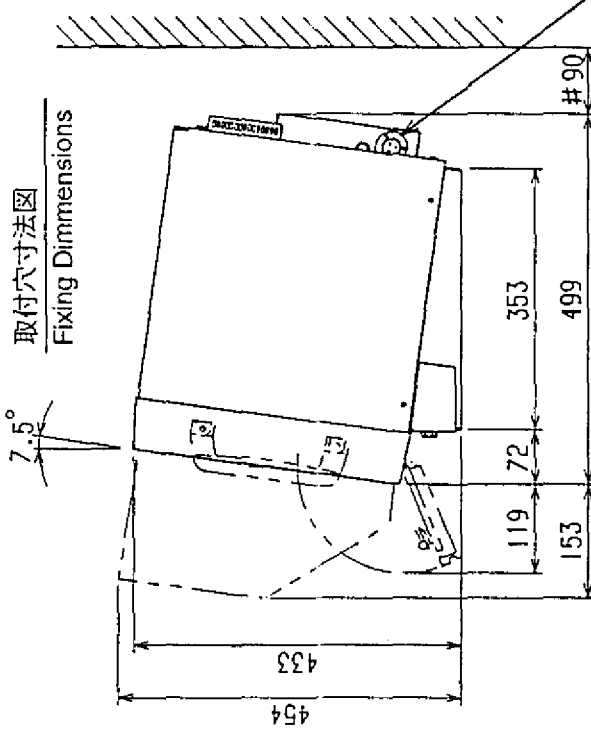
Improper setting of potentiometer R55 causes the seabed line to be painted in deep blue due to the white line pulse. Adjust it so that the seabed is painted in reddish brown.



範囲 Range	公差 Tolerance
$L \leq 50$	$\pm 1\text{mm}$
$50 < L \leq 100$	$\pm 2\text{mm}$
$100 < L \leq 500$	$\pm 3\text{mm}$
$500 < L \leq 1000$	$\pm 4\text{mm}$
$1000 < L \leq 2000$	$\pm 5\text{mm}$
$2000 < L \leq 4000$	$\pm 7\text{mm}$
$4000 < L \leq 8000$	$\pm 10\text{mm}$
$8000 < L$	$\pm 15\text{mm}$

表 1 Table 1

取付穴寸法図  
Fixing Dimensions



注記:

- 1) サービス時、指示部を前方に充分引き出せるようにケーブルの余裕を持たせよ。
- 2) 取付用ネジはM10 ボルトまたはコーチボルト呼び径9を使用。
- 3) #印は最小サービス空間を示す。
- 4) 指定外の寸法公差は表1による。

NOTE:

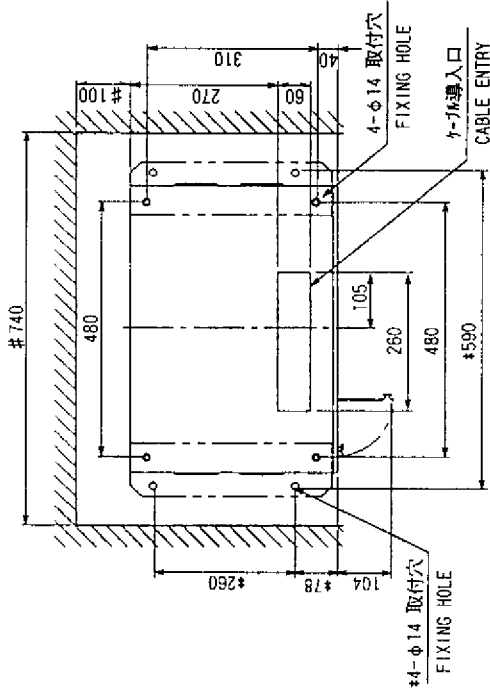
- 1) Leave sufficient extra cabling.
- 2) Use M10 bolts or φ9 coach screws for fixing the unit.
- 3) #: recommended service clearance.
- 4) See table for tolerance.

DRAWN 山本 隆夫 E. Miyoshi  
CHECKED 山本 隆夫 E. Miyoshi  
APPROVED 山本 隆夫 E. Miyoshi  
DATE 1976.06 TAKAHASHI  
APPLICABLE TO CSH-55  
SCALE 1/10 MISS BLOCK NO.  
DWG NO. C1297-006-B 10-057-1000-61

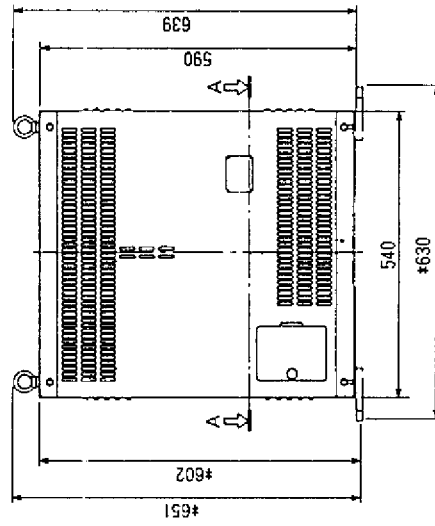
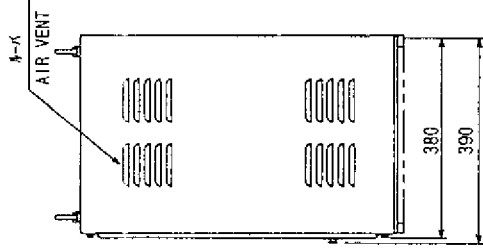
TYPE 名称 CSH-550, CSH-556  
指示装置、副指示器  
NAME 外寸図  
DISPLAY UNIT, SUB-DISPLAY UNIT  
OUTLINE DRAWING

- 注 記
- 1) 装備ケーブルの端末処理は 装備要領書参照のこと。
  - 2) \*印寸法は 外足取付時の寸法とする。(取外し可)
  - 3) 取付用ネジは M10 ボルトまたは コーチボルト 呼び径 9 を使用のこと。
  - 4) #印寸法は 最小サービスマン寸法とする。

- NOTE
- 1) REFER TO INSTALLATION INSTRUCTIONS FOR FABRICATION OF CABLE ENDS.
  - 2) \*: OUTSIDE LEGS (REMOVABLE) MOUNTING DIMENSION.
  - 3) USE M10 BOLTS OR  $\phi$  9 COACH SCREWS FOR FIXING THE UNIT.
  - 4) #: RECOMMENDED SERVICING CLEARANCE.



矢視 A-A  
VIEW A-A



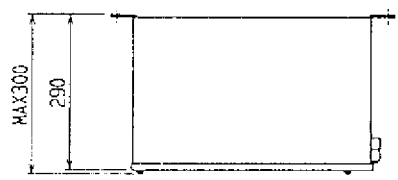
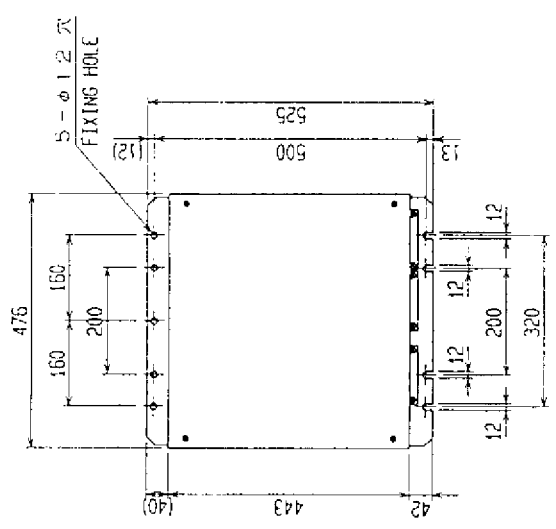
A

B

C

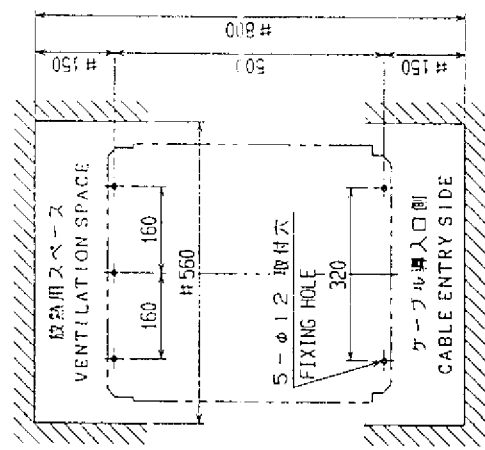
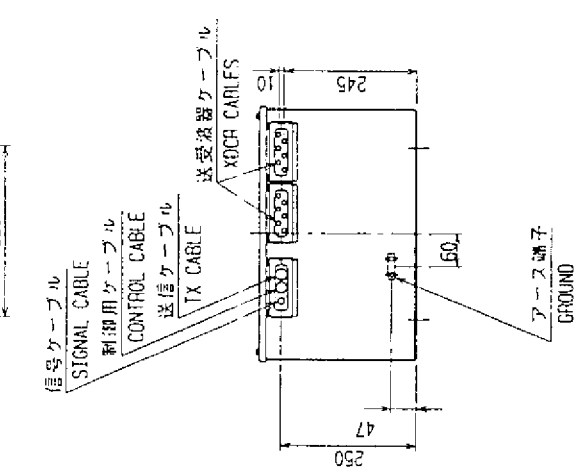
D

REMARKS		TYPE 名称	CSH-551 送信装置
DRAWN T.T.		NAME	TRANSMITTER UNIT
SCALE		DWG. NO.	C1297-602-A
APPROVED T.T.		BLOCK NO.	
SCALE		APPLICABLE TO: (MODEL)	CSH-55
MASS 82 kg			



注 記 1) 取付用ネジはM10ボルトまたはコーナボルト呼び径φ9を使用のこと。  
 #印寸法は最小サービス空間寸法とする。

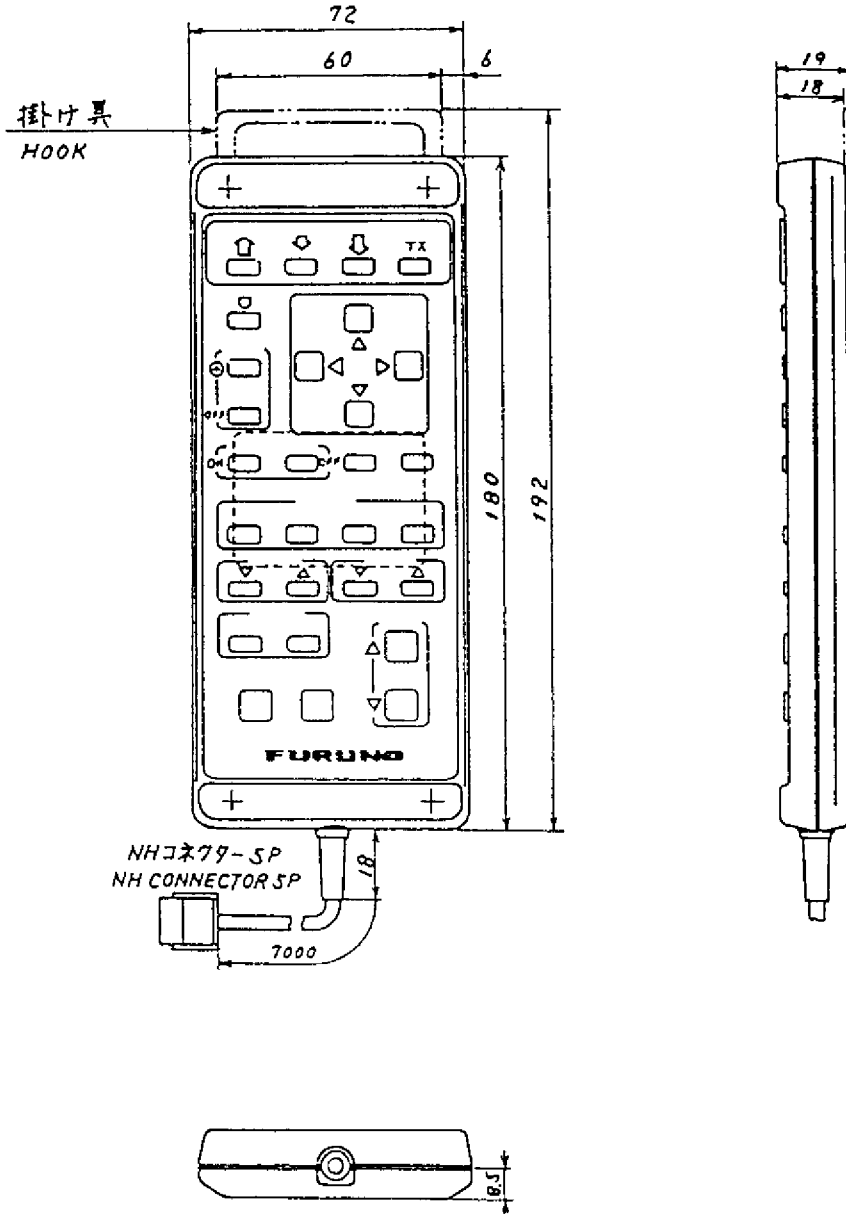
NOTE 1) USE M10 BOLTS OR φ9 CORNER BOLTS FOR FIXING THE UNIT.  
 # : RECOMMENDED SERVICING CLEARANCE.



取付寸法図  
 MOUNTING DIMENSION

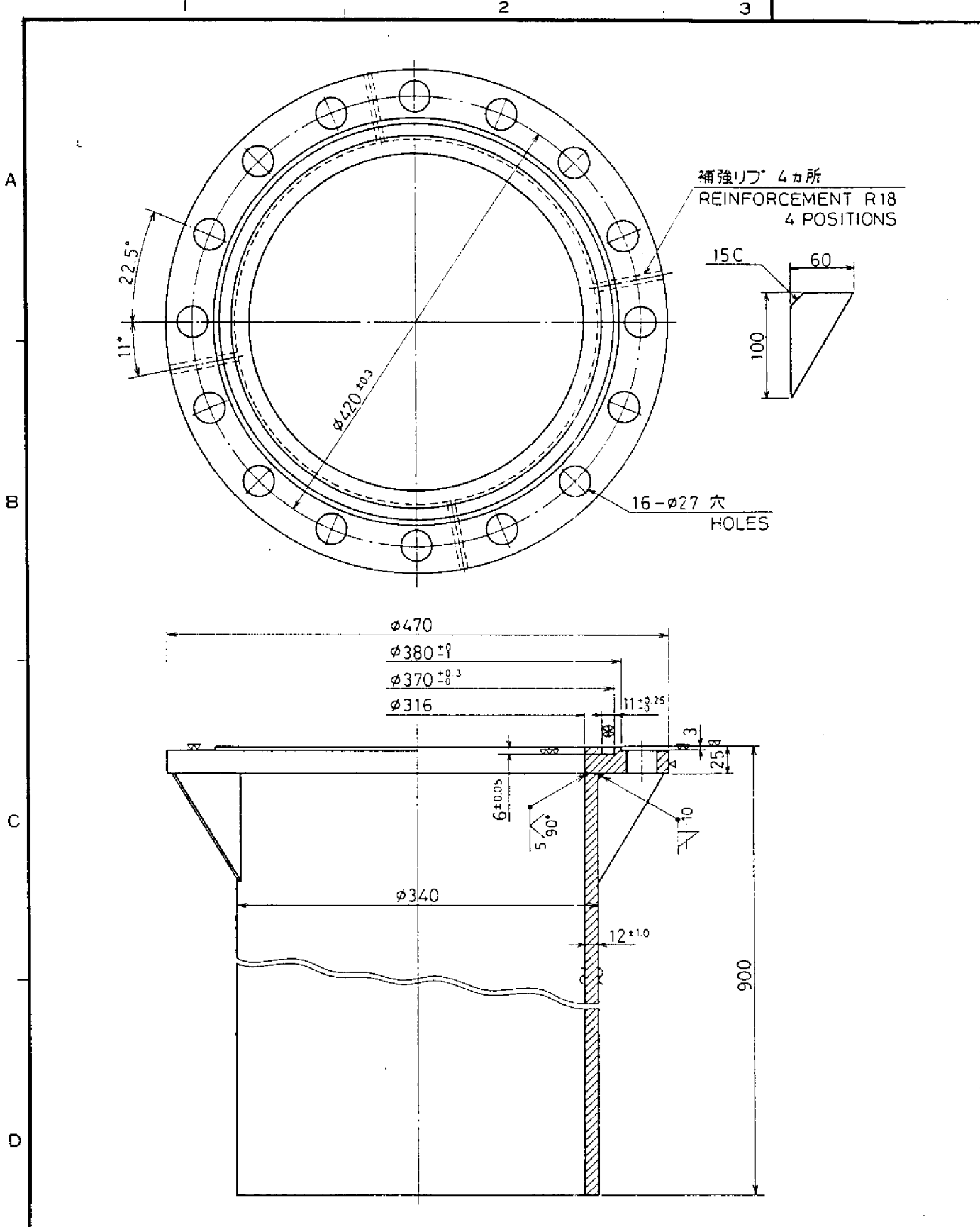
SERIALS		TYPE CSH-552	
DRAWN APPROVED 1981.11.17		名称 受信装置	
T.I.T. 1/1 C.A.P.		NAME RECEIVER UNIT	
SCALE 4:5		DWG. NO. C1297-601-A	
CSH-55		BLOCK NO.	
APPLICABLE TO (MODEL)		BLOCK NO.	

A  
B  
C  
D

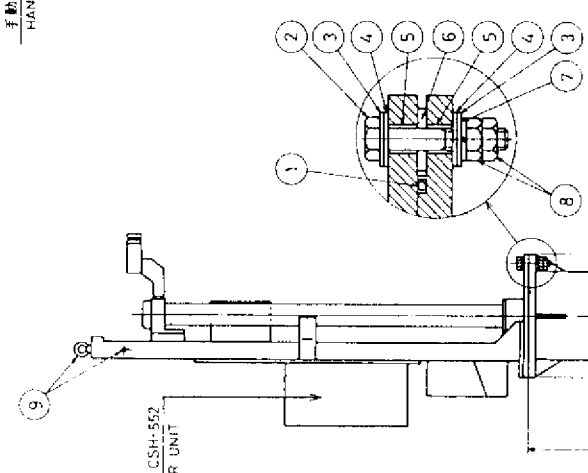
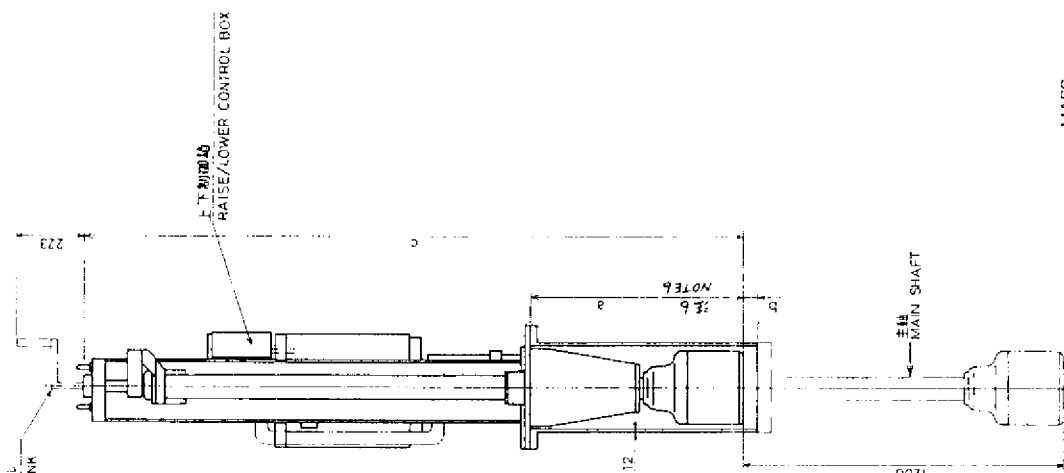
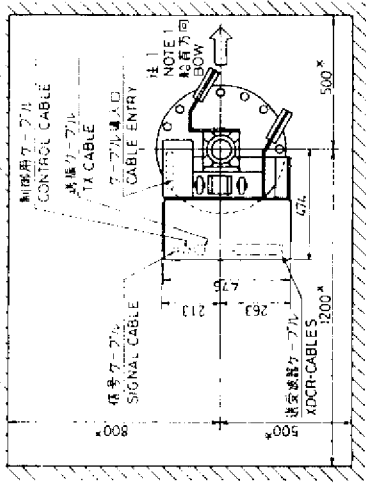


REMARKS				TYPE	CSH-115
				名称	リモート箱
DRAWN	APPROVED			NAME	REMOTE CONTROL BOX
T.T	Aug 16 '99			DWG NO.	C1297-607- A
SCALE	1/2	MASS	0.4 kg	APPLICABLE TO:	(MODEL)
				BLOCK NO.	





CSH-70/80/50/60		品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.NO.	摘要 REMARKS
承認 APPROVED	DEC. 1 '87 T. NAKAJI	三角法 THIRD ANGLE PROJECTION		名称 TITLE		格納タンク外観図 RETRACTION TANK	
検図 CHECKED	DEC. 1 '87 T. KODI	尺度 SCALE	1/5				
製図 DRAWN	DEC. 1 '87 N. SAITO	重量 WEIGHT	100 kg	図番 DWG.NO.	C1260-048-A		



- 注
1. 船台フランジ上の矢印⇨を船首方向に一致させること。これができないときは、整備後、指示装置での配置調整が必要。
  2. 整備位置に応じて50mm以内で切断のこと。
  3. 保守点検のための最良の隙、図中※印のスペースを設けること。
  4. 整備後、アイナットおよび船台上部開孔※を利用して振れ止め用のステーを張ること。
  5. 走行時、水面に対して主軸が垂直になるように整備のこと。

- NOTE
1. THE BOW MARK ⇨ ON GALLOW'S FLANGE SHOULD FACE SHIP'S BOW. IF NOT, HEADING ADJUSTMENT SHOULD BE MADE AT INSTALLATION.
  2. CUT THE TANK WITHIN 50MM IN LENGTH ACCORDING TO INSTALLATION SITE.
  3. DIMENSIONS MARKED "※" SHOW MINIMUM MAINTENANCE SPACE.
  4. STRETCH STAYS FOR ANTI-VIBRATION BY USING TWO EYENUTS AND SIDE HOLE (⑨) AFTER INSTALLATION.
  5. INSTALL THE PULL UNIT ON THE MAIN SHAFT IS PERPENDICULAR TO SEA SURFACE WHEN CRUISING.

ITEM	NAME	QTY	MATERIAL	REMARKS
9	アイナット EYE-NUT	2	S541	M20
8	六角ナット HEX NUT	32	SUS304	M20
7	バネ鋼金 SPRING WASHER	16	SUS304	FOR M20
6	パッキン(1) GASKET(1)	1	CR	SHG-0003
5	パッキン(2) INSULATION PACKING(2)	25	MS-1000-68	
4	パッキン(2) GASKET(2)	25	SHG-0004	
3	平座金 FLAT WASHER	25	SUS304	SHG-0002
2	六角ボルト HEX BOLT	9	SUS304	M20 x 120
1	O-RING	1	JISB2401 P355	

MASS  
50kHz: 289kg  
28kHz: 310kg

REMARKS  
1200ストローク

DRAWN  
T.T.

SCALE  
1:1 MASS

APPROVED  
T.T.

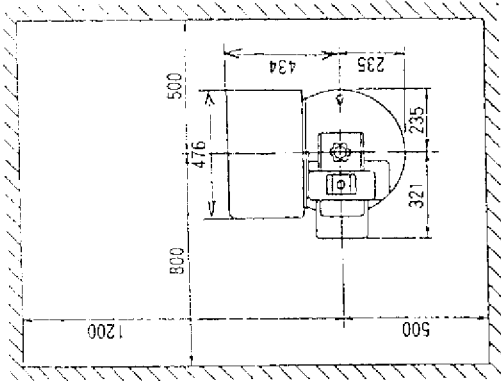
MODEL  
CSH-55

BLOCK NO.  
HULL UNIT

DWG NO.  
CSH-5512

THE  
NAME  
HULL UNIT

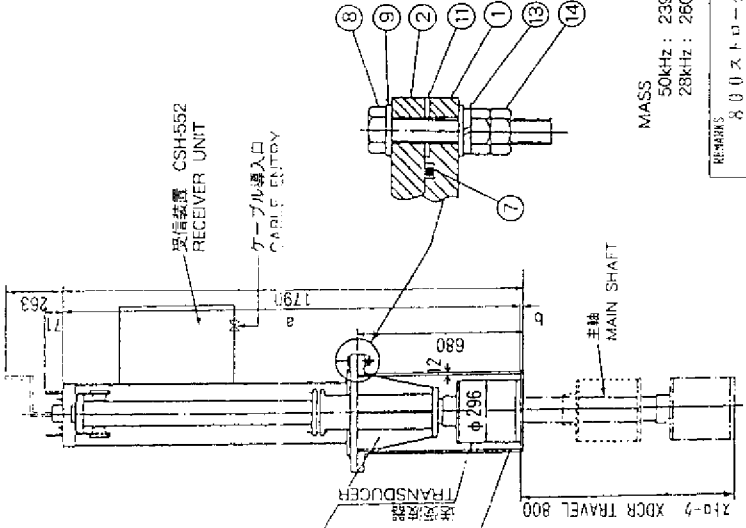
寸法 Dim.	a	b	c
50kHz	800	50	2470
28kHz	758	82	2438



1. 船首方向の矢印を船首方向に一致させること。これができないときは、上付装置の船首方向を左右45°ステップを変更できる場合は文面に指定のこと。
2. 取付位置に応じて220mm以内の切断のこと。
3. 取付位置のため最小限 取付部のスペースを設けること。
4. 取付後、アライメントおよび取付上部端面の歪みを利用して振れ止め用のスチールを張ること。
5. 取付時、水面に対して主軸が垂直になるように取付のこと。

NOTE

1. THE BOW MARK ONLY GALLOW'S FLANGE SHOULD FACE SHIP'S BOW IF NOT. HEADING DIRECTION OF HULL UNIT CAN BE CHANGED AT 45° INTERVALS. SPECIFY WHEN ORDERING.
2. CUT THE TANK WITHIN 220MM IN LENGTH ACCORDING TO INSTALLATION SITE
3. DIMENSIONS MARKED "※" SHOW MINIMUM MAINTENANCE SPACE.
4. STRETCH STAYS FOR ANTIVIBRATION BY USING TWO EYEBOLTS AND SIDE HOLE (9) AFTER INSTALLATION.
5. INSTALL THE HULL UNIT SO THE MAIN SHAFT IS PERPENDICULAR TO SEA SURFACE WHEN CRUISING



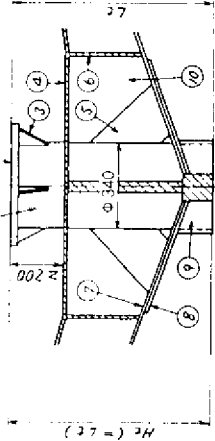
MASS  
50kHz: 239kg  
28kHz: 260kg

振動子型式 TRANSDUCER TYPE	a (mm)	b (mm)
CSH-55-50	1710	80
CSH-55-28	1742	48

ITEM	品名	数量	単位	図番	備考	REMARKS
15	受信箱 (1)	1				
14	受信箱 (1)	32				
13	受信箱 (1)	16				
12	受信箱 (1)	1				
11	受信箱 (1)	1				
10	受信箱 (1)	25				
9	受信箱 (1)	9				
8	受信箱 (1)	1				
7	受信箱 (1)	1				
6	受信箱 (1)	1				
5	受信箱 (1)	1				
4	受信箱 (1)	1				
3	受信箱 (1)	1				
2	受信箱 (1)	1				
1	受信箱 (1)	1				

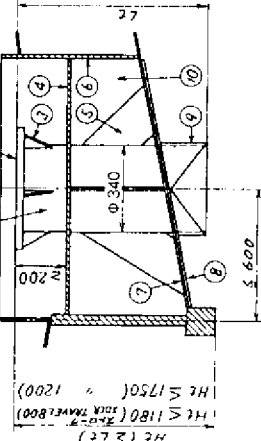
REMARKS	800ストローグ
TYPE	CSH-5508
名称	上下装置
NAME	HULL UNIT
図番	CSH-55
ブロック No.	
適用図番	
図番	
DWG. NO.	CSH-55
図番	
備考	
REMARKS	

① キール上(突出) ON KEEL (PROJECTED)



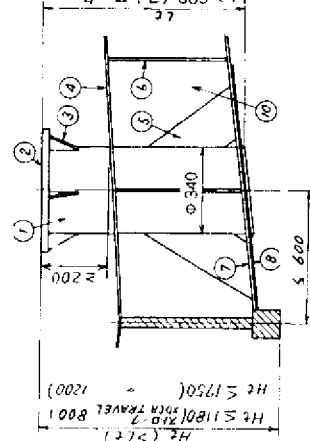
680~900 (X) 1200 (X)  
 XDCR TRAVEL 800)  
 850~900 (X) 1200 (X)  
 XDCR TRAVEL 1200)

② キール横(突出) OFF KEEL (PROJECTED)



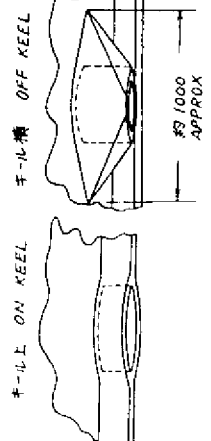
680~900 (X) 1200 (X)  
 XDCR TRAVEL 800)  
 850~900 (X) 1200 (X)  
 XDCR TRAVEL 1200)

③ キール横(非突出) OFF KEEL (NOT PROJECTED)



680~900 (X) 1200 (X)  
 XDCR TRAVEL 800)  
 850~900 (X) 1200 (X)  
 XDCR TRAVEL 1200)

④ 整流覆 FAIRING PLATE



キール上 ON KEEL キール横 OFF KEEL  
 約 1000 APPROX

装 備 予 順

- 1 船底整流覆(整流板)の取付位置を明示する。
- 2 次の事に注意して船艙タンクの船底板に整流覆を取付指示する。  
 \* 船艙タンクの上面の標準型船底板は水平に取付する。  
 \* 船底板の中心の中心の船底板の中心に取付する。  
 \* 整流覆の取付位置は船底板の中心の中心の中心に取付する。  
 \* 整流覆の取付位置は船底板の中心の中心の中心に取付する。  
 \* タンク下部がキールより下に出ないようタンクの底を $\phi 340$ とし、 $Ht \leq 1750$ とし、且つ、整流覆がタンク下部より出ないように図示の範囲内にする。(標準型は長さ 900 mm)
- 3 船艙タンクの図面に外径 $\phi 1000$ 以上のフランジ(9)も取付指示。  
 又長尺板(10)の取付位置は整流覆(10)の図面に取付指示。  
 フランジと整流覆とは船底板と同じ材質、厚さのものを使用する。
- 4 タンク周囲に内積がある場合には、隔壁(8)も取付指示。  
 コアプレート(9)も取付指示。
- 5 タンク周囲の所々に補強板(5)も取付指示。
- 6 上下葉は本機を船艙タンクにボルト締りするに必要ならスペースとしてフランジ面の位置が2重船底板より200 mm以上確保する。2重船底、古い船には、(6)図の方法で2重船底板を下げ、スペースを確保する。

INSTALLATION METHOD OF RETRACTION TANK

1. Cut out  $\phi 340$  hole on hull and inner hull plate into account.
2. Install tank to hull plate with fillet welding taking the following points into account.
  - \* Flange face is exactly horizontal at normal ship's trim.
  - \* One of 24 Bolt holes on flange is faced dead ahead.
  - \* Allow height of flange face from keel bottom "Ht" mentioned in the drawings, otherwise transducer beam is blocked by the keel when transducer is fully lowered.
  - \* Tank's length "Lt" should be less than "Ht", if not so, bottom end of tank is placed below keel level. "Lt" is also limited as shown in the drawings so that the transducer can be fully retracted in tank. (The tank is supplied with 900mm long as standard.)
3. Fit doubling plate (8) of outer dia.  $\phi 1000$  around the tank on hull plate. Fit fairing plate (9) referring to the drawing (1) for installation method (A) and (B). Use same material and thickness of doubling and fairing plate as hull plate.
4. Provide cofferdam around the tank in order to isolate the tank from the oil tank.
5. Install 4 pcs. of reinforcement plates between the tank and the hull plate.
6. Allow clearance of more than 200mm below the flange face for easy bolting. Sink the inner hull plate as shown in the drawing (B) for high inner hull plate.

ITEM	品名	数量	材質	計量	仕入	備考
品名	数量	材質	計量	仕入	備考	REMARKS
10	コッファダム					
9	整流覆					
8	フランジ					
7	補強板					
6	油槽隔壁					
5	補強板					
4	二重船底板					
3	補強リブ					
2	タンクフランジ					
1	船艙タンク					

CSH-55

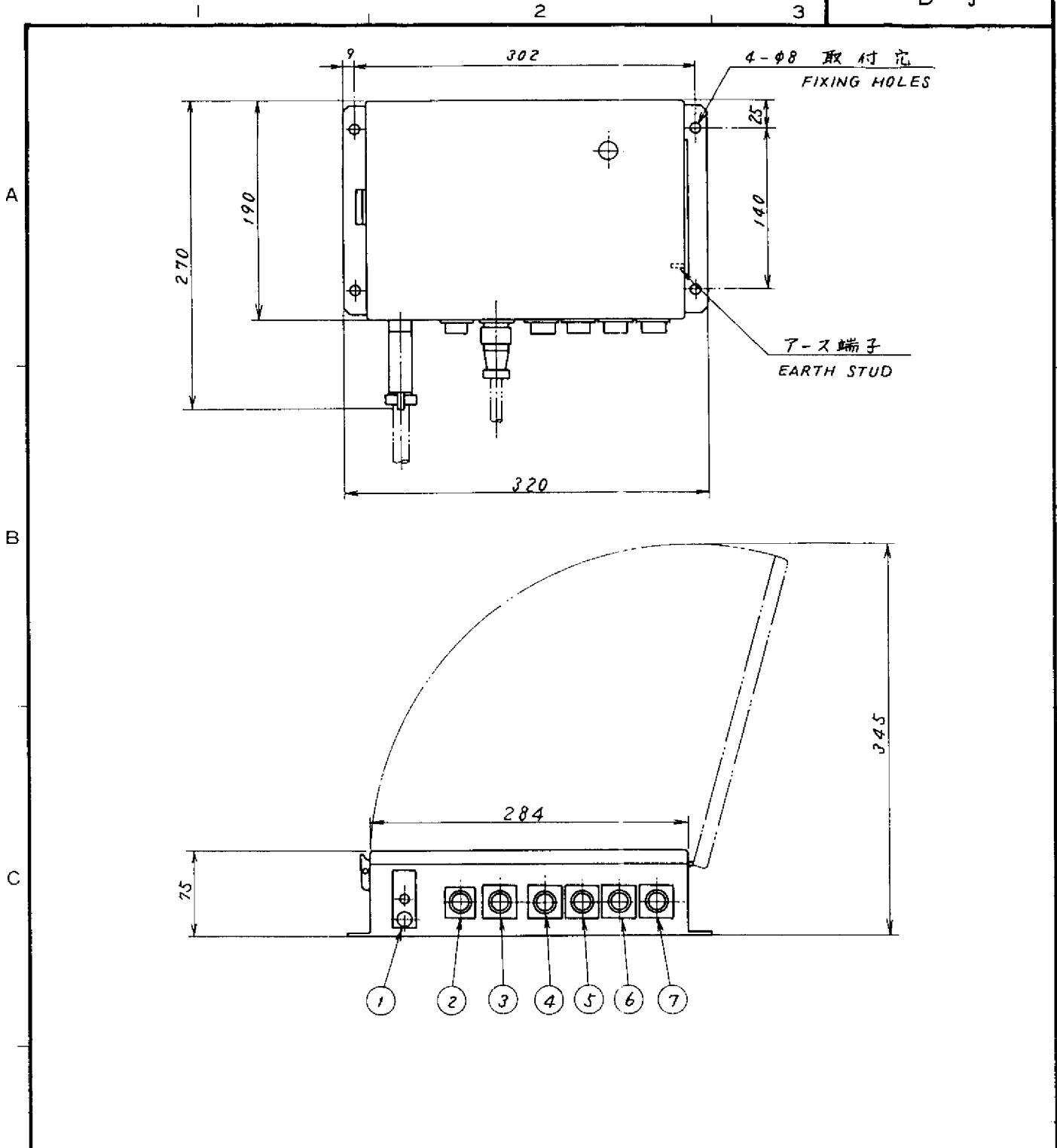
REMARKS

THE TYPE CSH-55  
 名称 船艙タンク整流覆取付図 (船底)

DRWN: APPROVED / 100 10 77  
 T.A.T. 100 10 77  
 SCALE: MASS kg

APPLICABLE TO: CSH55  
 (DOUBLE)

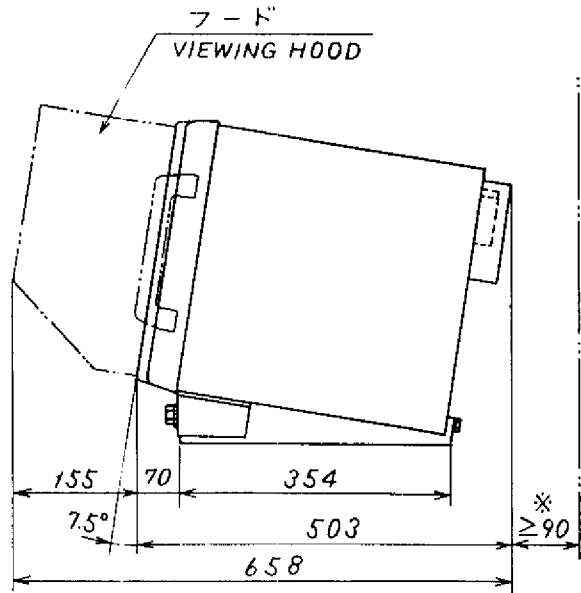
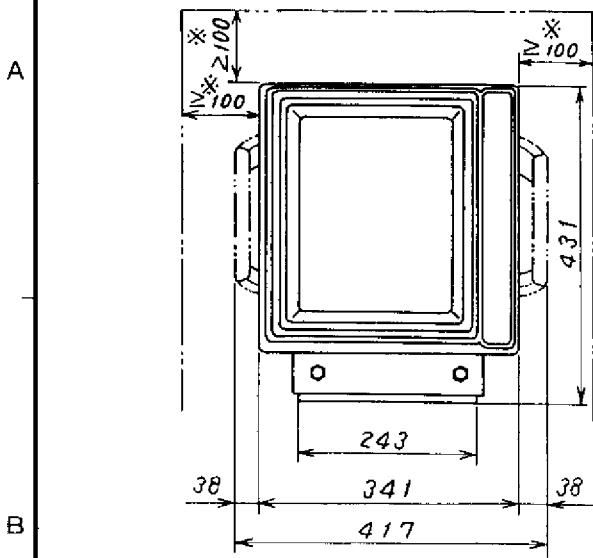
BLOCK NO. RETRACTION TANK INSTALLATION  
 DWG. NO. C1297-005-A



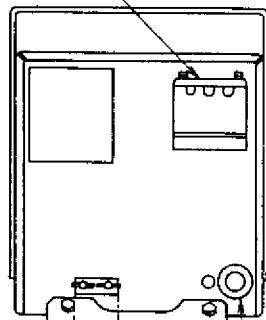
7	魚探レセプタクル	RECEPTACLE FOR ECHO SOUNDER
6	潮流計	FOR DOPPLER SONAR CURRENT INDICATOR
5	航法装置	FOR NAVIGATION SYSTEM
4	ジャイロ	FOR GYRO COMPASS
3	ネットゾンデ	FOR NET ZONDE
2	ログ	FOR SPEED LOG
1	カラ-魚探ディスプレイ指示器レセプタクル	FOR COLOR SCANNING SONAR DISPLAY

品番 ITEM	名称 NAME
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承認 APPROVED	NOV. 7 1980	三角法 THIRD ANGLE PROJECTION	名称 TITLE	CS-120A
検図 CHECKED	Nov. 7 1980 <i>[Signature]</i>	尺度 SCALE		外部インターフェース INTERFACE UNIT
製図 DRAWN	07.30.80 <i>[Signature]</i>	重量 WEIGHT	3 kg	図番 DWG. NO. C1233-005-D

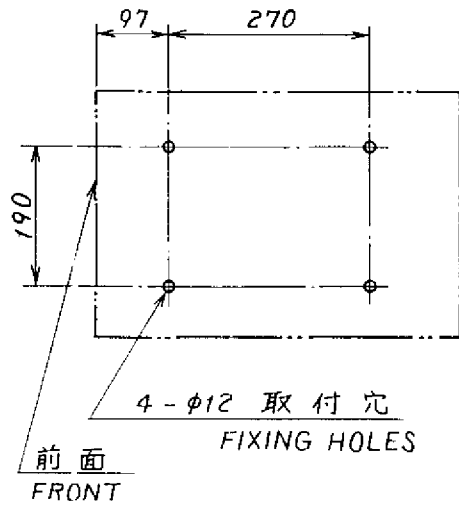


ケーブル導入口  
CABLE ENTRY



アース銅帯  
COPPER STRAP

電源コネクター  
POWER CONNECTOR

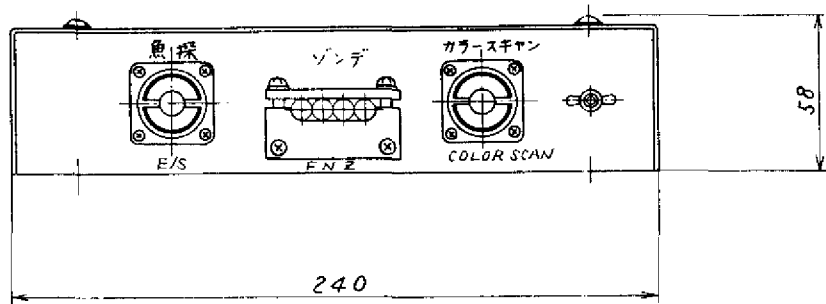
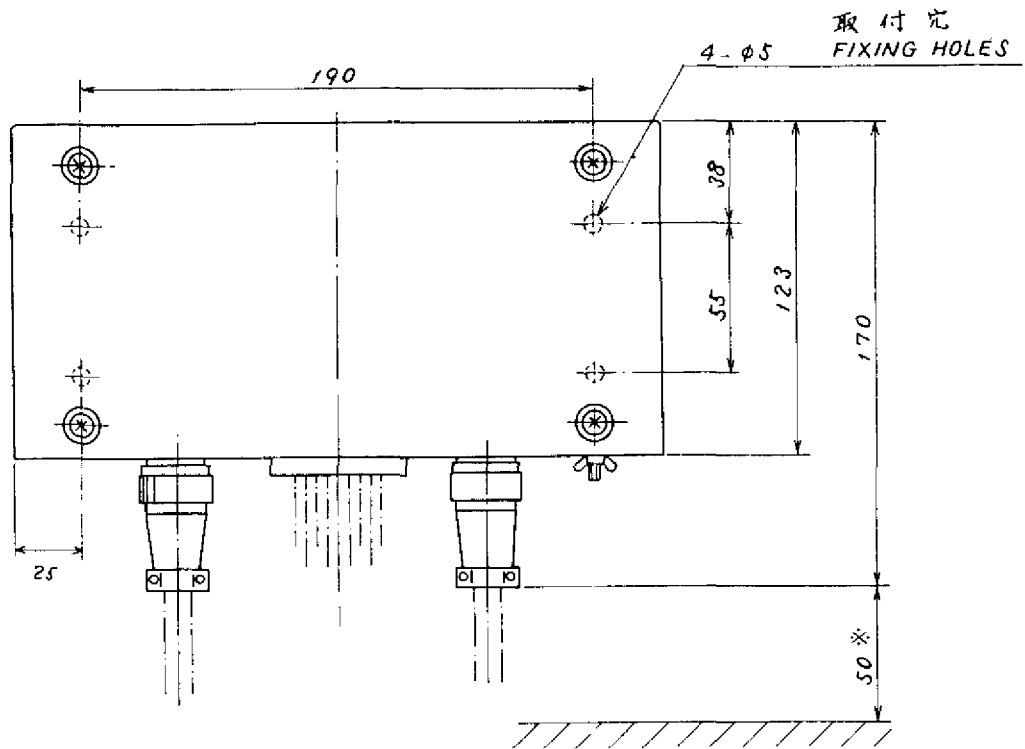


取付寸法  
MOUNTING DIMENSION

NOTE 1. 保守点検及び放熱用として\*印のスペースをとる事。  
DIMENSIONS MARKED "\*" SHOW MINIMUM MAINTENANCE AND VENTILATION SPACE.

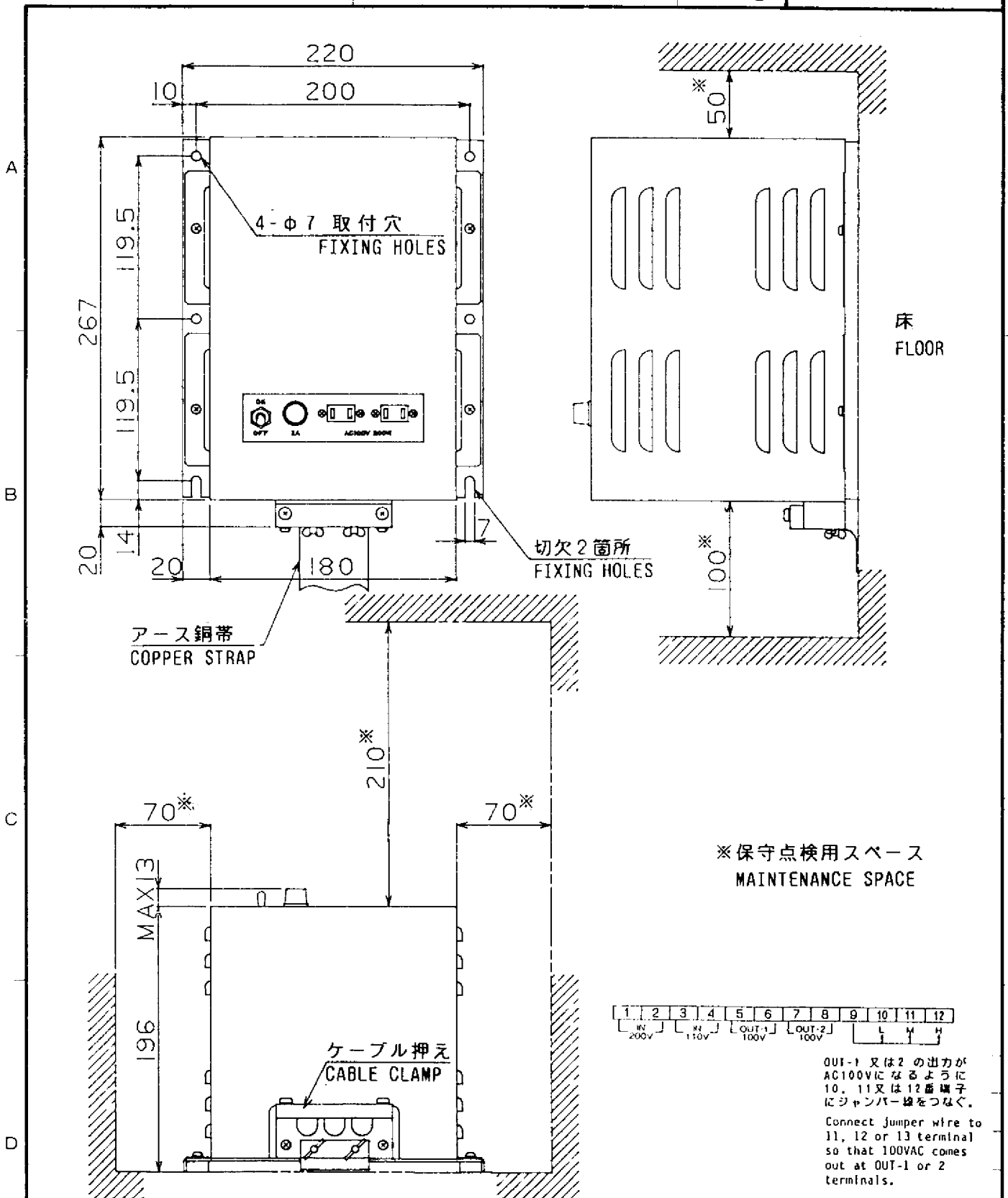
承認 APPROVED	品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.NO.	摘要 REMARKS
JUN. 19. 1985 <i>[Signature]</i>		三角法 THIRD ANGLE PROJECTION				
検査 CHECKED	17. June. 85 <i>[Signature]</i>	尺度 SCALE		1/10		名称 TITLE CSH-100 リモートディスプレイ外寸図 REMOTE DISPLAY UNIT
製 DRAWN	17th June. 85 <i>[Signature]</i>	重量 WEIGHT		24 kg	図番 DWG.NO.	C1257-060-A

A  
B  
C  
D



NOTE ケーブル導入用として\*印のスペースを最小限取る事。  
DIMENSION MARKED \* SHOWS RECOMMENDED SPACE FOR CABLING.

	品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.NO.	摘要 REMARKS
承認 APPROVED:	DEC. 2 . 1980	三角法 THIRD ANGLE PROJECTION				名称 TITLE CS-170 ネットゾンデ接続箱 FNZ JOINT BOX
検図 CHECKED:	Dec. 1 . 1980	R 度 SCALE				
製図 DRAWN:	Dec. 1 . 1980	重量 WEIGHT	2 kg		図番 DWG.NO. C1233-007-B	



承認	品番	品名	材質	数量	図番	摘要
APPROVED	ITEM	NAME	MATERIAL	QTY	DWG. NO.	REMARKS
承認 MAB. 8. 1. 25 <i>[Signature]</i>		三角法 THIRD ANGLE PROJECTION				
検図 CHECKED <i>[Signature]</i>		尺度 SCALE 1/4				
製図 DRAWN <i>[Signature]</i>		重量 WEIGHT 22 kg				
						名称 TITLE PT-400 電源変圧器 STEP-DOWN TRANSFORMER
						図番 DWG. NO. C0005-002-B





