

JRC *NCR-300A*

NAVTEX RECEIVER



INSTRUCTION MANUAL

PRECAUTION FOR OPERATION

- ◆ This equipment is not initialized by turning on because the contents of Random Access Memory (RAM) circuit are maintained by the back-up circuit (*Note 1, 2*). So everytime power is applied, the status should be confirmed by the following the procedure described in the para. 2.6.4 of this manual. (Refer to para. 2.6.2.)

Note 1: The contents of RAM maintained by the back-up circuit are as follows:

- 1 *Programmed Contents*
- 2 *Stored Preamble*

Note 2: The contents of the back-up RAM are kept more than 24 hours even if the main power is cut off.

CAUTION

Before making a new voyage, execute following operation so that the back-up RAM is initialized.

- Press **POWER** key while pressing and holding the **OFF** key to turn off the main power.
- Press **POWER** key while pressing and holding the **▽** and **△** keys.

- ◆ Care should be taken to the following points when handling thermal printing paper:
 - Thermal printing paper is special paper which is discolored by thermochemical reaction.
 - Since the paper is vulnerable to heat, moisture, light, etc. whether used or unused, store it in a cool and dry place.
 - Touching the paper with sweaty hands will leave fingerprints on the paper or make the recordings blurry.
 - Rubbing the paper with a hard object will discolor the paper.
 - When gluing the paper, generally use a water solvent glue. Starch, composite glue, etc. is suitable.
 - Since adhesive tape will discolor thermal printing paper, hold the back of the paper with double sided tape, etc.
 - Do not let the paper touch vinylchloride film for long time. The recordings will turn brown.
 - If diazo process or moist copies are attached immediately after copying, the thermal printing paper will be discolored.
 - Organic solvents will discolor the paper.
- ◆ When cleaning this equipment, take care following points:
 - When this equipment is wiped with thinner, gasoline and so forth, this equipment discolor.
 - Wipe this equipment with a clean and soft cloth with noting or synthetic detergent.

REQUEST

Please fill up the attached SHIP REGISTER LIST for making out our maintenance records.

1. Fill up procedure

After installation, fill up the ship register list of stencil paper in the carton.

2. Address

Return the ship register list to JRC after filling up.

Address: JAPAN RADIO CO., LTD

Mitaka Plant

1st. Engineering Department

3rd. Marine Radio Eng. Section

1-1-5, Shimorenjaku

Mitaka-shi, Tokyo

181 JAPAN

SHIP REGISTER LIST FOR NAVTEX RECEIVER	
Model: NCR-300A	Serial No. GD 10777
Ship's Name: JRC MARU	
Call Sign: JRCM	
Flag: JAPAN	Tonnage(gross): 1000
Ship's Type: Oil Explorer	
Active Antenna(NAV-300A): <input checked="" type="checkbox"/> With <input type="checkbox"/> Without	Type of Antenna:
Power Supply: 24 V DC	
or <input type="checkbox"/> V AC with power supply unit NBG-122	
Dockyard Hull No.: 777	
Installed Port or Dockyard: YOKOHAMA PORT	
Installer	Company: JRC TOKYO
	Technicians Name: T. YAMADA
Delivery Date: 24th APR., 1988	
Ship's Owner: JRC (TOKYO JAPAN)	
Remarks:	

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CHAPTER 1

GENERAL INFORMATION

1.1 INTRODUCTION

This manual covers the functions, operation and installation of the NCR-300A NAVTEX receiver.

The NCR-300A has been designed to automatically receive Navigational and Meteorological warnings and urgent information and to print out with the built-in printer.

The NCR-300A is compact and can be manufactured at a low cost, so that this unit can be installed in any type of ship easily.

NAVTEX means the system for the broadcast and automatic reception of marine safety information by means of narrow-band direct printing telegraphy.

NAVTEX is a component of IHO/IMO world-wide navigational warning service (WWNWS) defined by IMO Assembly resolution A.419 (XI), and NAVTEX has been included as an element of the Global Maritime Distress and Safety System (GMDSS) which will be implemented from 1st FEB. 1992.

In the GMDSS, NAVTEX receiving capability will become part of the mandatory equipment which is required to be carried in certain vessels under the provision of the revised chapter IV of the 1974 SOLAS convention from 1st AUG. 1993.

1.2 OUTLINE OF THE SYSTEM

1.2.1 Broadcasts

The navigational and meteorological warnings, Search and Rescue (SAR) and the other informations are collected to the NAVTEX coast station and are broadcasted in English at the 518 kHz frequency all over the world. The broadcasting time for one broadcast is less than 10 minutes. Usually for one station, the broadcasting time is allotted for 4-hour intervals. (Refer to Figs. 1, 2 and 3 in IMO NAVTEX MANUAL.)

1.2.2 Message format

ZCZC B ₁ B ₂ B ₃ B ₄
(TIME OF ORIGIN)
SERIES IDENTITY+CONSECUTIVE NUMBER
.....
MESSAGE TEXT
.....
NNNN

ZCZC: Defines the end of the phasing period

B₁B₂B₃B₄: Message ID (preamble)

B₁ (Transmitter identity): Letters from A to Z to identify the communication range of the transmitting station.

B₂ (subject indicator): Letters from A to Z to indicate the kinds of message

A: Navigational warnings *1

B: Meteorological warnings *1

C: Ice reports

D: Search And Rescue (SAR) information *1

E: Meteorological forecasts

F: Pilot service messages

G: DECCA messages

H: LORAN messages

I: OMEGA messages

J: SATNAV messages

K: Other electronic navaid messages

L: Navigational warnings—additional to letter A *2

V, W, X, Y: Special service—allocation by NAVTEX panel.

Z: Means that there is no message to be broadcasted.

*1 Cannot be rejected by the receiver.

*2 Should not be rejected by the receiver (continuation of B₂ subject group "A").

B₃B₄: Two-digit serial number allocated to each B₂. These numbers start from 01 excluding the special case where the serial number 00 is used.

B₃B₄=00 is used to print out the message compulsorily even if the station or of a kind of message is rejected from objects of reception at the receiver side. The receiver should receive and print out this message all the time when it receives this message.

NNNN: End of the message

1.2.3 Receiver

The receiver is composed of the 518 kHz receiver, microprocessor and printer. The received messages are stored in the message memory, edited and sent out to the printer according to the print format.

1.2.4 Print control of the receiver

- Operator can set up the unit so as to automatically reject information of the unnecessary areas for the ship's navigation from objects of printing by using the transmitter identification character B₁.
- Operator can set the unit so as to prohibit printing of the message which is not required for the ship, excluding the case where the subject indication characters are A, B and D, by using the subject indication characters B₂.
- The message ID (B₁B₂B₃B₄) of the message received at the character error ratio (CER) of 4% or less is stored in the memory, and even if the message with the same ID is received again within 72 hours, it is not printed out.

The store capacity of message IDs is 128. If over, the oldest ID is erased.

Thus, the message which has the same message ID as the one of the erased message ID will be printed out, even if within 72 hours. The stored message ID can be checked by pressing the **STATE** key.

1.3 FEATURES

The NCR-300A NAVTEX receiver has the following features:

- fully meets CCIR Recommendation 540-1, 476-3 and 625 and IMO Performance Standards.
- compact, light weight design
- full automated operation
- various operation functions
- high data processing ability using multiprocessor system
- legible print-out
- Message ID being received is displayed on the LCD simultaneously with the message reception.
- four kinds of audible alarms; paper out, when received message of category A, B, D, or L
- character error rate (CER) is printed out at the end of the message in a form of percents.
- can be used as a monitoring receiver for the coastal station using coastal station mode
- available displaying the reason of non-print-out message during receiving
- available printing out the status while receiving message and vice-versa
- available receiving message while printing out the formerly received message
- available programming while receiving message and vice-versa
- available storing 128 message IDs for 72 hours
- stored message IDs can be printed out, displayed and erased

1.4 EQUIPMENT SUPPLIED

The NCR-300A is normally supplied with the items listed in Table 1-1. When unpacking the unit carton, check that all items are included. If missing, please notify your dealer immediately.

Table 1-1 Equipment Supplied

Equipment	Part NR	Q'ty
NAVTEX Receiver	NCR-300A	1
Mounting Yoke	MPBX16298	1
Instruction Manual	6ZPAF00005	1
Operation Card	6ZPAF00007	1
Thermal Printing Paper	5ZPCU00003 (FH65BU-2 25 m)	1
Fuse	5ZFAD00044 (MF51NN-3A)	2
Mounting Screw	BRTG03217	4

1.5 SPECIFICATIONS

1.5.1 Electrical Specification

- RECEIVER

Receiving frequency: 518 kHz
Receiving mode: F1B NAVTEX Broadcasting
Sensitivity (50Ω input): CER better than 1×10^{-2} at 1 μV input
Frequency stability: ±15 Hz
External AF input: 1,700±85 Hz 0 dBm in 600 ohms
Antenna input: 50 ohms for active or wideband antenna and high impedance for wire antenna

- PROCESSOR

Signalling mode: 7 unit SITOR code and NAVTEX decoding procedure in accordance with CCIR Recommendations 476-3, 625 B-mode and 540-1

- PRINTER

Type of printing: Thermal
Character/line: 40
Roll paper: 80 mm wide thermal printing paper
Outer Diameter: 50 mm
Inner Diameter: 11.2 mm min.
Paper out: Audible alarm and flickering **ALARM** and **P-OUT** on the LCD

- CONTROLS

Power ON/OFF
Programming of AREA, MESSAGE, Logging mode and Save mode (option)
Paper feed
Alarm OFF
Print-out for programmed condition
Self-diagnostic test
Lighting for printing paper, display and switches

- INDICATIONS

Selected or rejected AREA (**AREA, ENABLED, DISABLED** and an ALPHABET)
Selected or rejected MESSAGE (**MESSAGE, ENABLED, DISABLED** and an ALPHABET)
Alarm OFF (**ALARM DIS**)
Receiving message (**RCV**)
Paper out (flickering **P-OUT** and **ALARM** simultaneously)
Receiving an urgent message (flickering **MSG** and **ALARM** simultaneously)
SAVE (option)

- ALARMS

Urgent message (audible sound and flickering **MSG** and **ALARM** on the LCD)
Paper out (audible sound and flickering **P-OUT** and **ALARM** on the LCD)
External alarm for Search and Rescue (SAR) information (open collector OUTPUT: 10 V, 400 mA max.)

- **POWER SUPPLY**

Power input: 10.8~35 V DC
Available 100/110/120/220/240 V AC using optional Power Supply Unit (NBG-122)

Power consumption: In case of 12 V,
4 Watts ... stand-by
6 Watts ... operating (peak current: 1.1 A)
In case of 24 V,
5 Watts ... stand-by
7 Watts ... operating (peak current: 0.6 A)

1.5.2 Mechanical Specification

- Temperature: -15°C to 55°C operating
-25°C to 75°C storage
- Humidity: up to 95% at 40°C
- Vibration: up to 500 cpm...3 mm
up to 1,800 cpm...1 mm
- Size: 242(W)×170(H)×128(D) mm
including Mounting Yoke
- Mounting: Bulkhead, Benchhead or overhead
- Weight: 2.5 kg including Mounting Yoke

1.5.3 Option

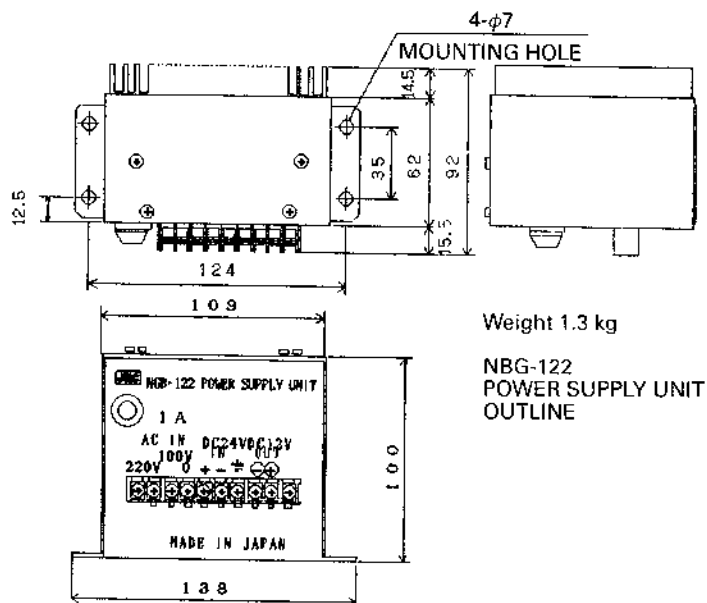
1) Power supply unit NBG-122

Input: AC 100/220 V
DC 24 V

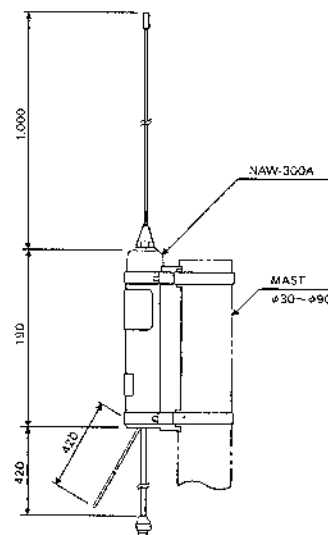
Output: DC 12 V

2) Active Antenna NAW-300A

Receiving frequency: 518 kHz
Output impedance: 50Ω
Bandwidth: 5 kHz
Weight: 0.5 kg



Weight 1.3 kg
NBG-122
POWER SUPPLY UNIT
OUTLINE

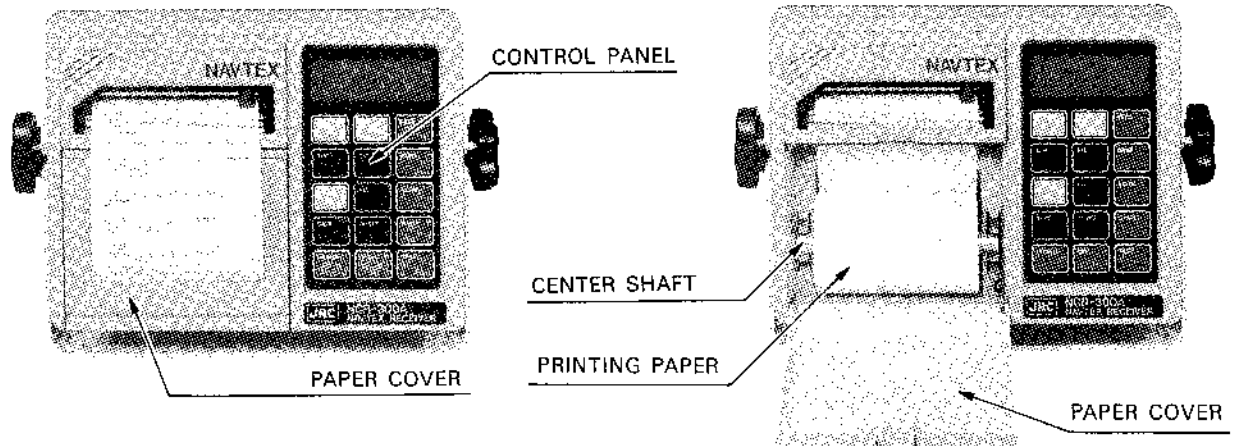


WEIGHT : Approx. 0.5kg
NAW-300A ACTIVE ANTENNA
OUTLINE

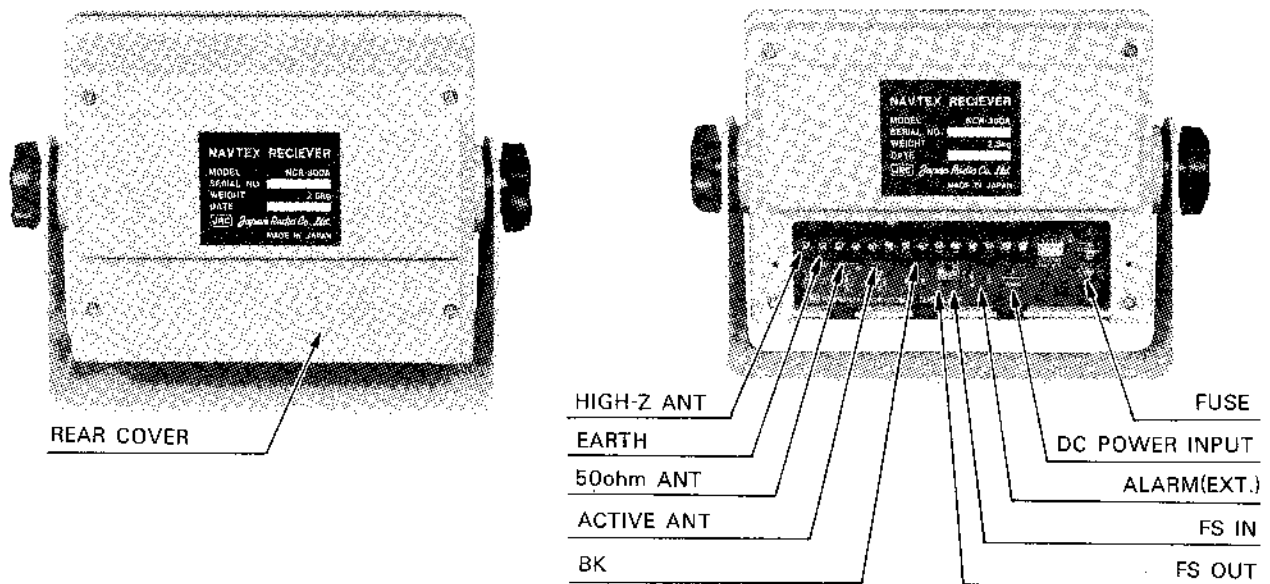
CHAPTER 2

OPERATION

2.1 FRONT VIEW



2.2 REAR VIEW



2.3 LCD DISPLAY





AREA
ENABLED *DISABLED*
MESSAGE
SAVE ALARM DIS


RCV
ALARM
MSG
P-OUT

2.4 CONTROL PANEL

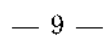
2.4.1 Key

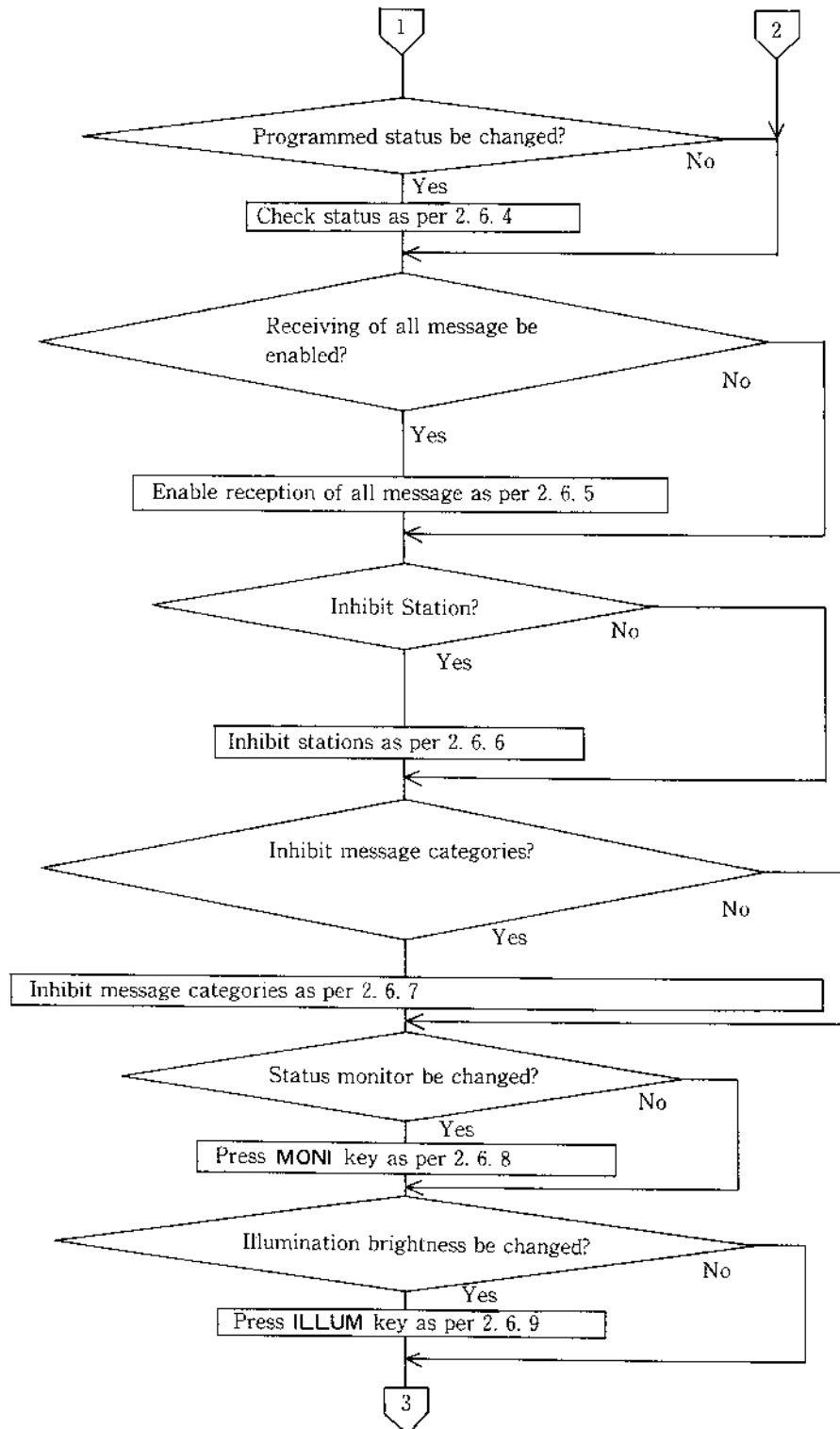
Key	Meaning	Function
POWER	Power On	Turns the main power ON. Turns the main power OFF, when the OFF key is pressed continuously.
OFF	Power off	Turns the main power OFF by using POWER key while OFF key is pressed continuously.
TEST	Test mode	Performs selftests.
FEED	Paper feed	Advances the printing paper.
MONI	Monitor	Turns the sound output of receiving signal from loud-speaker ON/OFF.
ILLUM	Illumination control	Controls the lightings of Liquid Crystal Display (LCD), switches and printer.
A/M	Area/Message	Changes selection of AREA and MESSAGE alternately while pressing and holding PROG key.
E/D	Enabled/Disabled	Changes selection of ENABLED and DISABLED alternately while pressing and holding PROG key.
PROG	Program	Makes A/M , E/D , ALL , AL OFF and SAVE keys effective while pressing and holding PROG key.
ALL	Selected all	Releases the rejection of AREA and MESSAGE while pressing and holding PROG key.
AL OFF	Alarm off	Stops an alert, without PROG key. Prohibits the alarm for message categories A, B and L OFF while pressing and holding PROG key.
STATE	Print-out status	Prints out the programmed status
SAVE	Store received messages	Prohibits printing of received message until pressing this key again. (Optional function)
	Move up	Moves the symbol alphabet indicated on the LCD up through the alphabet.
	Move down	

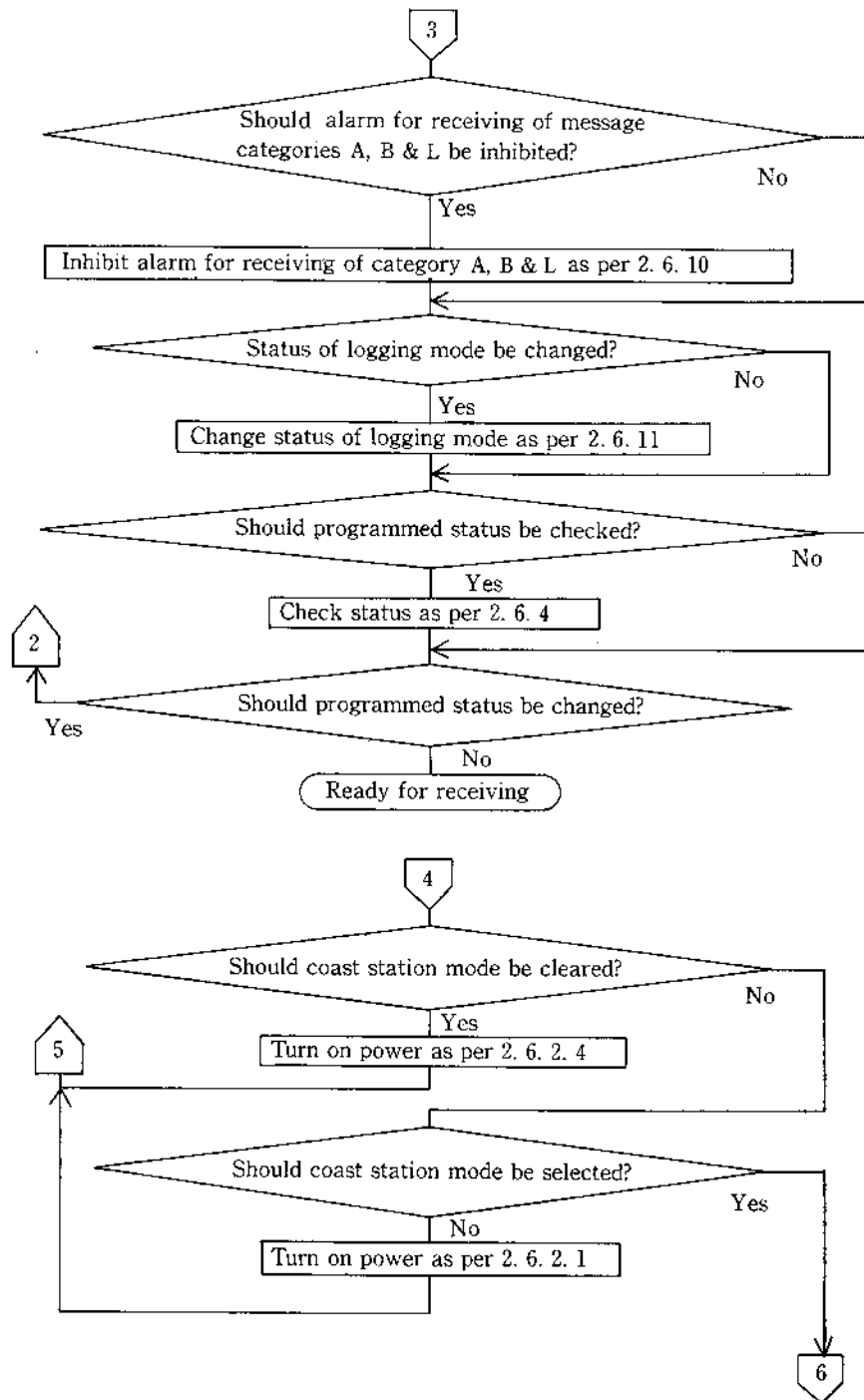
2.4.2 Display

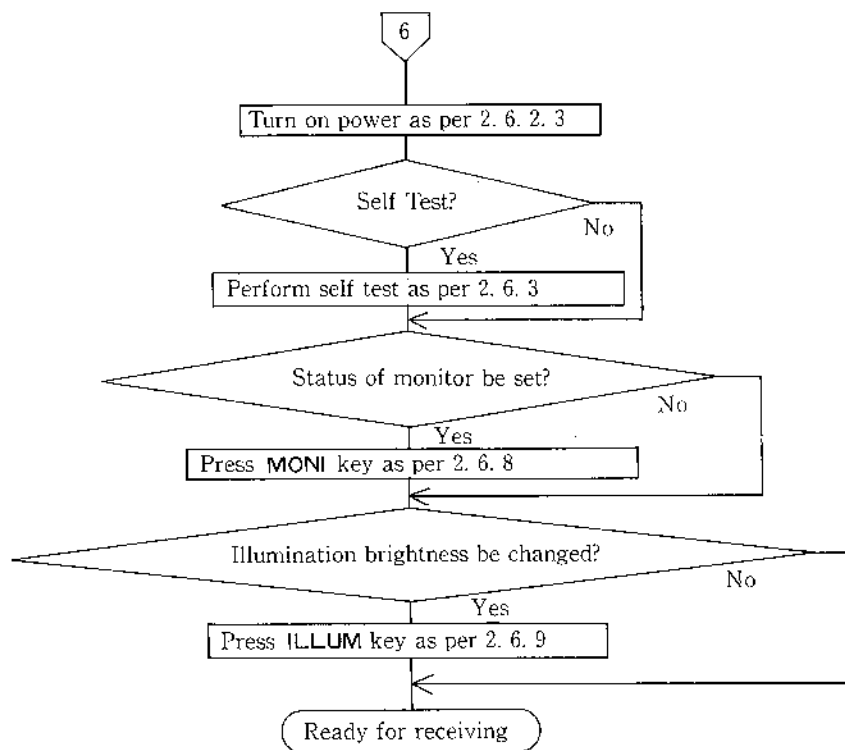
Display	Function
	Indicates the selected letter (B1 or B2), or indicates of the preamble being received during message receiving period.
AREA	Indicates that AREA on the LCD is being selected.
ENABLED DISABLED	Indicates whether the letter now being indicated is selected or rejected. DISABLED means rejected.
MESSAGE	Indicates that MESSAGE on the LCD is being selected.
ALARM DIS	(Alarm disabled) Indicates that the audio alarm for receiving message category A, B or L is prohibited.
RCV	Indicates that the equipment has been phased-in and is in receiving conditions.
ALARM and MSG (Flickering)	Indicates that the message category A, B, D or L has been received.
ALARM and P-OUT (Flickering)	Indicates that the printing paper have been running out.
SAVE	Indicates with lighting-up that the equipment has been under the SAVE mode, or indicates with flickering that the received messages are being stored in SAVE memory. (Optional function)

2.5.1 Start of Reception

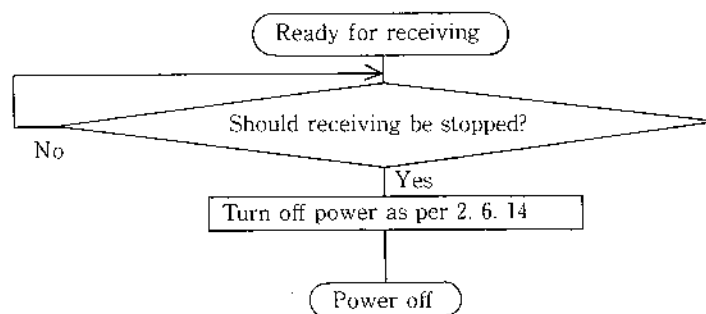








2.5.2 Power-off



CAUTION

Before making a new voyage, execute following operation so that the back-up RAM is initialized.

- Press **POWER** key while pressing and holding the **OFF** key to turn off the main power.
- Press **POWER** key while pressing and holding the **▽** and **△** keys.

2.6 CONTROL PANEL OPERATION

2.6.1 Thermal Printing Paper Loading Procedure

- 1) Cut straight the end of thermal printing paper perpendicular to the side. (When setting a new roll, this is not necessary.)

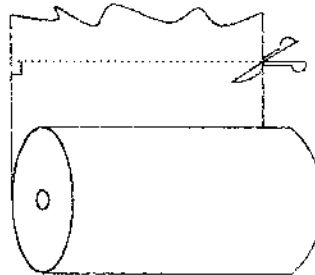


Fig. 1

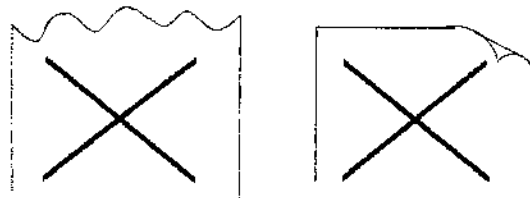


Fig. 2

If the wrinkled paper is inserted, there will be a paper jam around the printer.

If paper is jammed, dismount the main unit as per Paragraph 4.9, and remove the jammed paper.

- 2) Press **POWER** key to turn on the main power.
- 3) Open the paper cover and take out the center shaft.

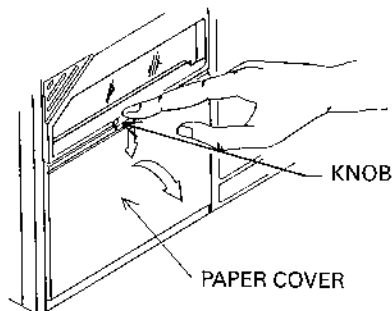


Fig. 3

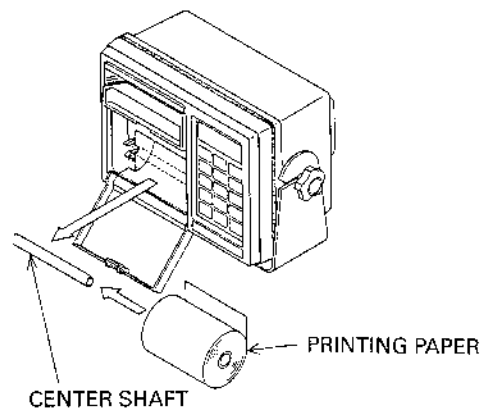


Fig. 4

- 4) Introduce the center shaft into the core of paper roll and insert the end of paper straight and deeply into the paper insertion slot until it will stop.
- 5) Until the paper is pulled in, hold the **FEED** key pressed.

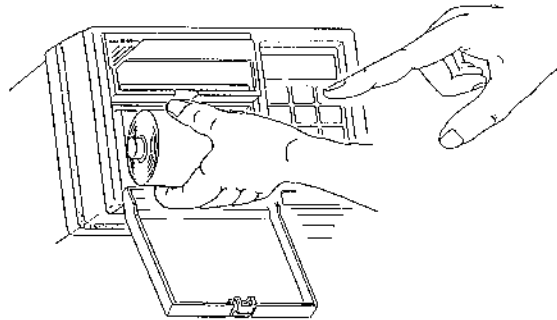


Fig. 5

- 6) When the paper is pulled in by the feeding mechanism, fix the center shaft to the holder. Press it firmly into place.
- 7) When the paper end comes out from the cutter, release the **FEED** key and press **AL OFF** key to release the paper out alarm. Close the paper cover, and depress the knob so that the paper cover is locked.

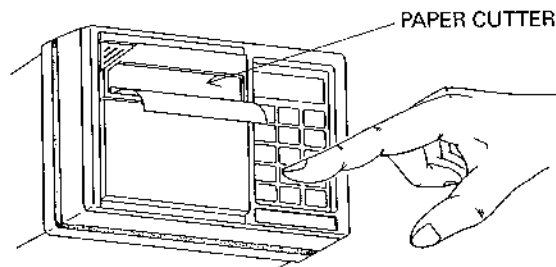


Fig. 6

2.6.2 Power on

2.6.2.1 Turn power on to keep a previous condition

- Press **POWER** key to turn on the main power.
- Following message is printed out on the printer.
 - 1) When a previous condition was normal receiving mode:

----- Navtex Receiver is Ready -----

- 2) When a previous condition was Logging Mode:

----- Logging Mode -----
----- Navtex Receiver is Ready -----

- 3) When a previous condition was Coast Station Mode:

----- Coast Station Mode -----
----- Navtex Receiver is Ready -----

- 4) When the contents of the back-upped RAM are broken:

----- Initialized -----
----- Navtex Receiver is Ready -----

2.6.2.2 Turn power on to initialize Back-upped RAM

- Press **POWER** key while pressing and holding the **▽** and **△** keys.
- Following message is printed out on the printer.

----- Initialized -----
----- Navtex Receiver is Ready -----

2.6.2.3 Turn power on to establish the Coast Station Mode

- Press **POWER** key while pressing and holding the **A/M** and **SAVE** keys.
- Following message is printed out on the printer.

----- Coast Station Mode -----
----- Navtex Receiver is Ready -----

2.6.2.4 Turn power on to cancel the Coast Station Mode

- Press **POWER** key while pressing and holding the **E/D** and **AL OFF** keys.
- Following message is printed out on the printer.

1) When a previous condition was normal receiving mode:

```
----- Navtex Receiver is Ready -----
```

2) When a previous condition was Logging Mode:

```
----- Logging Mode -----  
----- Navtex Receiver is Ready -----
```

2.6.3 Self-diagnostic Test

- Press **TEST** key.

COMMENTS

The test is automatically done by pressing **TEST** key. The output of internal test signal generator is input into the RF circuit of the receiving module to make up an internal self-diagnostic loop. The result is printed out. Most of the parts of the internal circuits will be checked by the above test. When the test is done, the following messages might be printed out:

```
----- Press "AL OFF" -----  
----- Self Test End -----  
  
----- ZCZC AB00 PAGE 1 -----  
THE QUICK BROWN FOX JUMPS OVER THE LAZY  
DOG 123456789,?()= /@+  
NNNN  
---- End of Message CER= 0.0% ----  
----- Overall Test Start -----  
ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890?@  
abcdefghijklmnopqrstuvwxyz@(),.=+*%  
----- Printer Test Start -----  
----- Main processor : Good -----  
----- 518KHz Receiver : Good -----  
----- Self Test Start -----
```

- The audible alarm is started to sound....*Note*
- Press **AL OFF** key.

If anything out of order is found, replace the unit according to para. 4.1.

*Note: The audible alarm is not started to sound under indicating **ALARM DIS**.*

CAUTION

When the powerful RF interference is being input to the antenna input terminal, there may be a case that the self-diagnostic test cannot be done properly.

Therefore, care should be taken to the sound from loudspeaker as there is no interferences to the antenna terminal.

2.6.4 Checking of Present AREA/MESSAGE Rejection Condition

- Press **STATE** key.
- Print out the programmed contents.

EXAMPLE:

```
--- Programmed Navtex Receiver Status ---
** Disabled Area :
      ---D---H---L---P-----V---Z
** Disabled Message Type :
      -----G--J--M--P--S-----
** Alarm (for Message Type A,B&L) : Enabled
** Logging Mode : OFF
** Save Mode (Option) : OFF
** Monitor : ON
** Illumination : ON
** Stored MSG ID :
    GA43 GA51 GA61 GA87 GA96 SA73 TA19 TA27
    TA26 TA30 OA95 OA07 FA89 FA90 DA60 ME06
    ME04 XL35 XL36 XL38 XL41 XL47 XL58 XL59
    NA81 NL15 BA54 BA65 BA71 BA72 BA73 ME62
    BA22 NL45 BL46 BL48 BL58
```

or

- Press **A/M** key while pressing and holding the **PROG** key to select AREA or MESSAGE to be confirmed.
- Press **▽** or **△** key.
- Confirm ENABLED/DISABLED with the letter displayed on the LCD.
- Repeat pressing **▽** or **△** key.

COMMENTS

The present setting condition of AREA and MESSAGE, Alarm, Logging Mode (option), Monitor, Illumination and Stored Message ID can be confirmed by above operation. The result is printed out on the printer.

2.6.5 Releasing of Rejected Condition

- Press **[ALL]** key while pressing and holding the **[PROG]** key.

COMMENTS

All the rejections of AREA and MESSAGE are released by the above operation. After releasing, all the AREA and MESSAGE rejection information in the memory are turned to ENABLED.

2.6.6 Rejection of AREA

- Press **[A/M]** key while pressing and holding the **[PROG]** key to turn the **AREA/MESSAGE** indication to **AREA**.
- Press **[▽]** or **[△]** key to change indication on the LCD to the suitable letter.
- Press **[E/D]** key while pressing and holding the **[PROG]** key to turn the **ENABLED/DISABLED** indication to the desired state.

2.6.7 Rejection of Message Category (MESSAGE)

- Press **[A/M]** key while pressing and holding the **[PROG]** key to turn the **AREA/MESSAGE** indication on the LCD to **MESSAGE**.
- Press **[▽]** or **[△]** key to change indication on the LCD to the desired symbol.
- Press **[E/D]** key while pressing and holding the **[PROG]** key to turn the **ENABLED/DISABLED** indication to the desired state.

2.6.8 Switching of Loudspeaker

- Press **[MONI]** key.
- Audio sound from loudspeaker may be heard.
- To stop the sound, by pressing the **[MONI]** key once more.

COMMENTS

The signal sound can be heard from internal loudspeaker by the above operation.

2.6.9 Setting of Illumination

- Press **ILLUM** key.
- Panel lightings change as follows:
.....→Light→Half-light→Turn-off→Light→.....

2.6.10 Prohibition of Alarm of Message Category A and B

- Press **AL OFF** key once or twice while pressing and holding the **PROG** key so as to **ALARM DIS** on the LCD is indicated.

COMMENTS

The audible alarm for message category A, B or L can be prohibited or permitted preliminary by the above operation.

2.6.11 Setting of Logging Mode

- Press **▽** or **△** key until **Lg** (Lg) is shown on the LCD. *Note 1*
The character **Lg** is displayed on the LCD.
- Press **E/D** key while pressing and holding the **PROG** key to turn the **ENABLED/DISABLED** indication to **ENABLED**. *Note 2*

COMMENTS

Under the Logging mode, every incoming message preamble will be printed out. The following service messages are automatically printed out:

Case 1—When an incomplete preamble is received:

```
----- ZCZC A*01    PAGE 1 -----  
----- Incomplete Preamble -----
```

Case 2—When a message has been already received with the CER less than 4%:

```
----- ZCZC AA01    PAGE 1 -----  
----- Already Received Message -----
```

Case 3—When a message has been rejected previously by its message category:

```
----- ZCZC AC01    PAGE 1 -----  
----- Rejected Message Type -----
```

Case 4—When a message has been rejected previously by its AREA:

```
----- ZCZC AA01    PAGE 1 -----  
----- Rejected Area -----
```


Note 1: The character [Q] (Lg) is located between A and Z in the sequence of alphabet to be displayed on the LCD.

*Note 2: If logging mode is not necessary, the indication must be set to **DISABLED**.*

2.6.12 Feed the Printing Paper

- Press **FEED** key.
- The printing paper is advanced one line.

COMMENTS

During a period of pressing **FEED** key, the paper is continued to advance.

2.6.13 Turn-off an ongoing Audible Alarm

- Press **AL OFF** key.
- The audible alarm is turned OFF.

COMMENTS

This equipment has the following two kinds of alarms; the audible alarm and the optical alarm.

These alarms raised when receiving a message of category A, B, D or L, or when the paper is out, can be stopped by the above operation.

2.6.14 Switch-off the Main Power

- Press **POWER** key while pressing and holding the **OFF** key. *Note*
- The main power for the equipment is turned to OFF condition.

*Note: **OFF** key should be continuously pressed until releasing **POWER** key.*

2.6.15 Alarms

Alarms are initiated by the following cases:

- 1) When an urgent message is received e.g., message categories A, B, D and L. ... *Note*

Indication: a) Optical alarm

After the preamble is received, **ALARM** and **MSG** on the LCD are flickering simultaneously.

b) Audible alarm

After the completion of receiving message, the audible alarm is started to sound.

c) External alarm

After the completion of receiving SAR information, the open collector output starts switching on and off.

2) When the printer paper has been running out.

- Indication:
- a) Optical alarm
ALARM and **P-OUT** on the LCD are flickering simultaneously.
 - b) Audible alarm
The audible alarm is started to sound.

*Note: In case of 1, alarms for message categories A, B and L can be prohibited by pressing **AL OFF** key while pressing and holding the **PROG** key.*

2.7 RECEIVING OF NAVTEX MESSAGE

COMMENTS

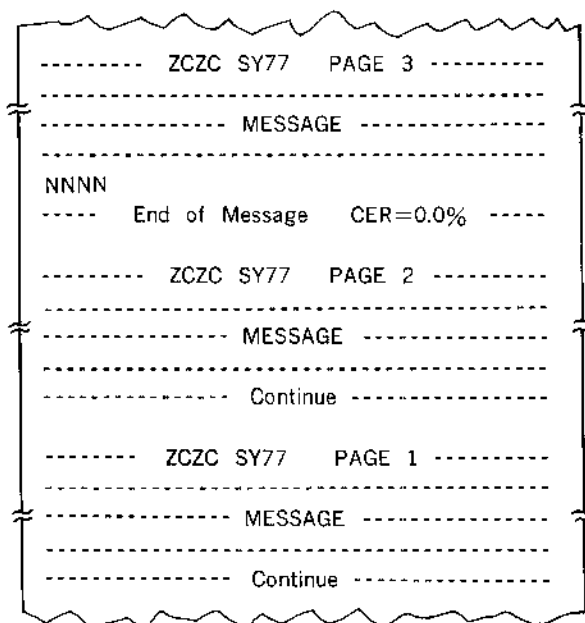
- 1) After the preamble is received, RCV is shown on the LCD, and the alphanumerical digits is flashing the letters and digits of the preamble, while the message is received.
- 2) When the message category is A, B, D or L, the indications **ALARM** and **MSG** on the LCD are flickering simultaneously. *Note 1*
- 3) After the completion of receiving message, RCV on the LCD is extinguished and printing is started. When the receiving message category is A, B, D or L, the audible alarm is started to sound. *Note 2, 3, 4, 5, 6*
- 4) For stopping audio alarm being sounded, press **AL OFF** key.

*Note 1: The above two indicators do not flicker under indicating **ALARM DIS** even if the received message category is A, B or L.*

Note 2: Paper out

- *When the paper is out receiving message:
The processing of receiving data is forcedly stopped and the message which has been received is deleted.*
- *When the paper is out during printing the message:
30 second after re-inserting the new paper to the printer, the message remained in the memory circuit is begun printing.*
- *During the period of paper-out, no data processing is done.*

Note 3: When the receiving message consists of more than 88 lines (40 characters/line max.), the message is printed out in accordance with the following format:



Note 4: The following messages are not printed out even if they have been received, the following message segments on the LCD indicate.

1) A message which has been rejected by AREA:

Indication: **AREA** and **DISABLED** are flickering simultaneously.

2) A message which has been rejected by MESSAGE Category:

Indication: **MESSAGE** and **DISABLED** are flickering simultaneously.

3) A message which has already been received under the Character Error Rate (CER) less than 4%:

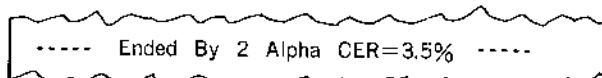
Indication: **MESSAGE** is flickering.

4) A message which preamble has not been detected error free:

Indication: **RCV** is not shown.

Note 5: If the "NNNN" at the end of the message is not printed out, the preamble is not stored in memory. Therefore in the following cases, the message is printed out if the same message is received once more:

1) When the message is ended is by two consecutive alphas in the DX positions*, the following service message is printed out at the end of message-print-out:



- 2) When the message is ended by detecting the phasing signal of following message, the following service message is printed out at the end of message-print-out:

----- Ended By Phasing SIG CER=2.7% -----

- 3) When the message is ended due to the phased out of the incoming signal before completion of receiving, the following service message is printed out at the end of message-print-out:

----- Incomplete Message CER=3.7% -----

* Each character is sent twice at DX position and RX position for the error correction. DX position is first transmission (Direct transmission) and RX is second (Re-transmission).

2.8 COAST STATION MODE

2.8.1 Setting

- Press **POWER** key while pressing and holding the **OFF** key to turn off the main power.
- Press **POWER** key while pressing and holding the **A/M** and **SAVE** keys.
- Following message is printed out on the printer.

----- Coast Station Mode -----
----- Navtex Receiver is Ready -----

COMMENTS

This mode will be used for monitoring the transmission of NAVTEX coastal station itself. Once the equipment is set to this mode, the status can be memorized by the memory circuit up to 24 hours even if the main power is cut off.

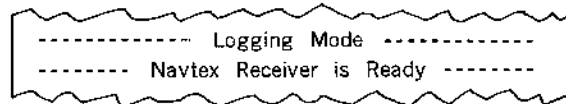
2.8.2 Return to the Normal Mode

- Press **POWER** key while pressing and holding the **OFF** key to turn off the main power.
.....NOTE
- Press **POWER** key while pressing and holding the **E/D** and **AL OFF** keys.
- Following message is printed out on the printer.

- 1) When a previous condition was normal receiving mode:

----- Navtex Receiver is Ready -----

2) When a previous condition was Logging Mode:



Note: **OFF** key should be continuously pressed until releasing **POWER** key.

2.9 ERASING OF THE STORED MESSAGE ID ($B_1B_2B_3B_4$)

The message ID which has been received with the character error ratio below 4% is stored in the memory. If the message with the same ID is received within 72 hours, it is not be printed. To print the same message which has the same ID as the one of the stored message ID again, erase the stored message ID which is to be printed again in the following procedure.

- 1) Press the **STATE** key to print the state. (Refer to 2.6.4.)
- 2) Confirm that there is the message ID to be erased among the stored IDs printed out by the item "****Stored MSG ID:**". (They are printed in the order from the oldest to the latest.)

- 3) By pressing the **ALL** key, the dividing line on the LCD display blinks and one of the stored message IDs is displayed on the LCD display in the following order and timing. Displaying the stored message ID is repeated until the **ALL** key is released.

⋮
⋮
⋮
B₁ (B₁ is displayed for 500 ms.)
Goes out (Nothing is displayed for 100 ms.)
B₂ (B₂ is displayed for 500 ms.)
Goes out (Nothing is displayed for 100 ms.)
B₃ (B₃ is displayed for 500 ms.)
Goes out (Nothing is displayed for 100 ms.)
B₄ (B₄ is displayed for 500 ms.)
Goes out (Nothing is displayed for 1500 ms.)
B₁ (B₁ is displayed for 500 ms.)
Goes out (Nothing is displayed for 100 ms.)
B₂ (B₂ is displayed for 500 ms.)
Goes out (Nothing is displayed for 100 ms.)
⋮
⋮
⋮

- 4) Select the stored message ID to be erased as follows:
 - a) By pressing the **▽** key while pressing and holding the **ALL** key, the message ID stored next to the displayed message ID is displayed. (However, if this operation is performed while the latest stored message ID is being displayed, the oldest message ID is displayed.)
 - b) By pressing the **△** key while pressing and holding the **ALL** key, the message ID stored before the displayed message ID is displayed. (However, if this operation is performed while the oldest message ID is displayed, the latest stored message ID is displayed.)

- 5) Confirm that the message ID to be erased is displayed and press the **E/D** key while pressing and holding the **ALL** key.
- 6) The displayed message ID is erased and the message ID stored after the cleared message ID is displayed. (However, if the latest message ID is cleared, the oldest message ID is displayed.)

CHAPTER 3

INSTALLATION

3.1 COMPOSITION

Refer to CHAPTER 1 Table 1-1 Equipment Supplied on page 3.

3.2 MAIN UNIT

The NCR-300A Main Unit may be mounted on table, shelf or overhead using the mounting bracket furnished. Select a convenient location suitable for easy viewing in a sheltered area out of direct sun rays if possible.

To mount the unit, remove the mounting yoke from the unit by loosening the knobs on each side of the NCR-300A. Attach the bracket to the desired mounting surface with attached screws. Slide the unit back into its yoke. At the desired position, secure the yoke knobs.

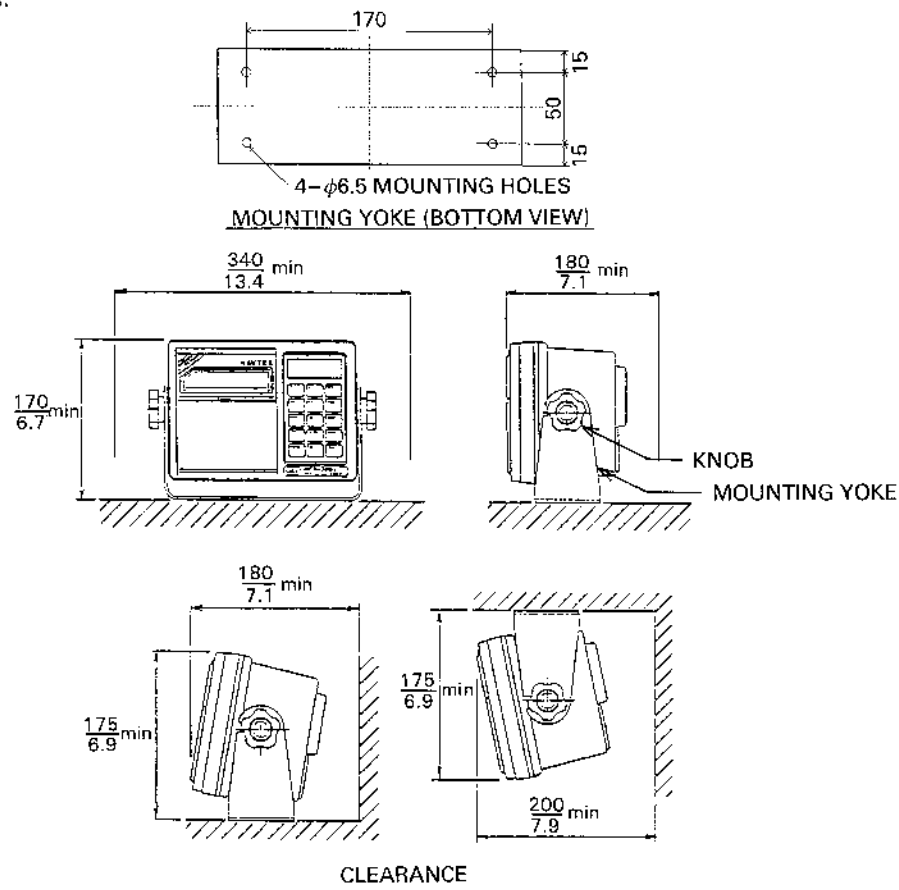
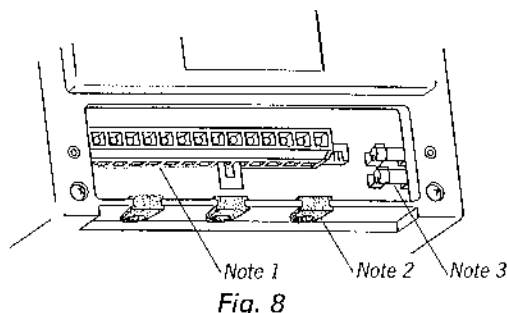


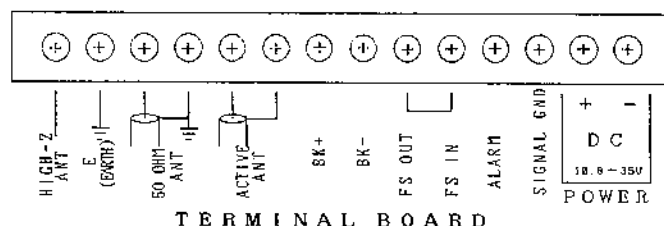
Fig. 7

3.3 ELECTRICAL CONNECTION

The connection with external equipment shall be performed as shown in Fig. below after the removal of the REAR COVER in the back lower part of the unit. As the terminal board is provided, with a simple tool like screwdriver, so that it can be easily connected.



Note 1: This terminal board is to connect the antenna, power supply, etc. The connection work can be performed with either cross-point screwdriver or flat tip screwdriver.



Note 2: This is water-resistant rubber packing. As shown in Fig. 9, break a rubber thinner part and pass the cable through it then fix the packing to the main unit.

Note 3: With floating power supply, the fuses for both polarities (+), (-) are provided. When abnormality occurs, this protects the receiver and power supply.

3.3.1 Power supply connection

Connect the power supply cable to the terminals of terminal board shown in Fig. below in paying attention not to connect wrong.

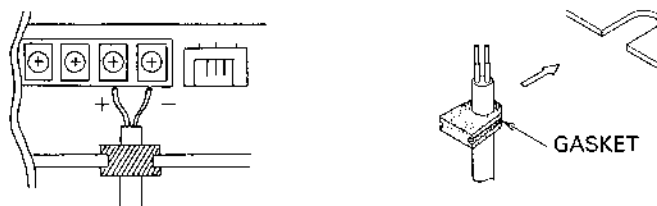


Fig. 9

When the power supply cable is of 2 wires with shield, and shield is connected to the ground, it shall be connected to the point E on terminal board.

Example of installation wiring

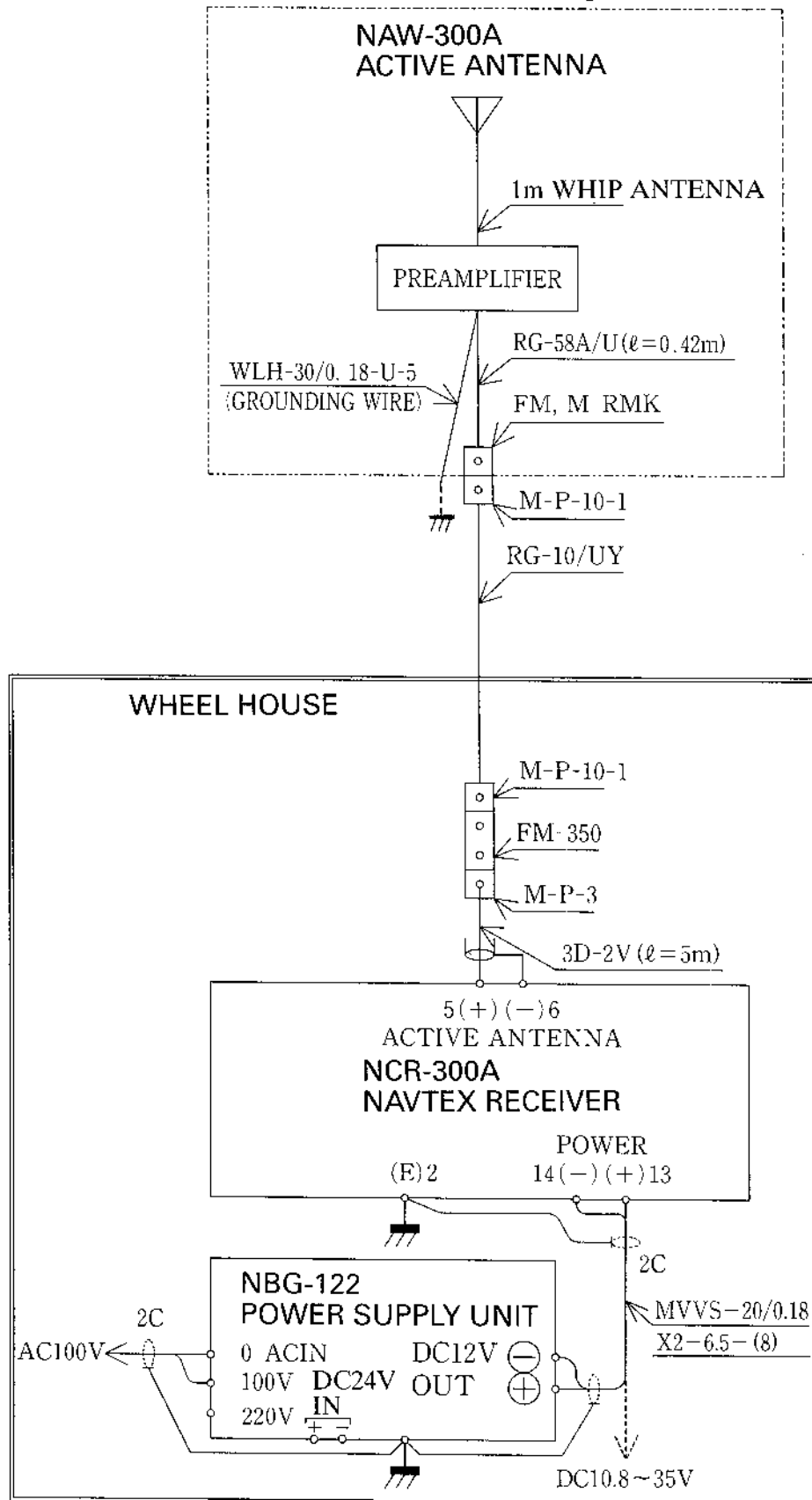


Fig. 10

3.3.2 Antenna connection

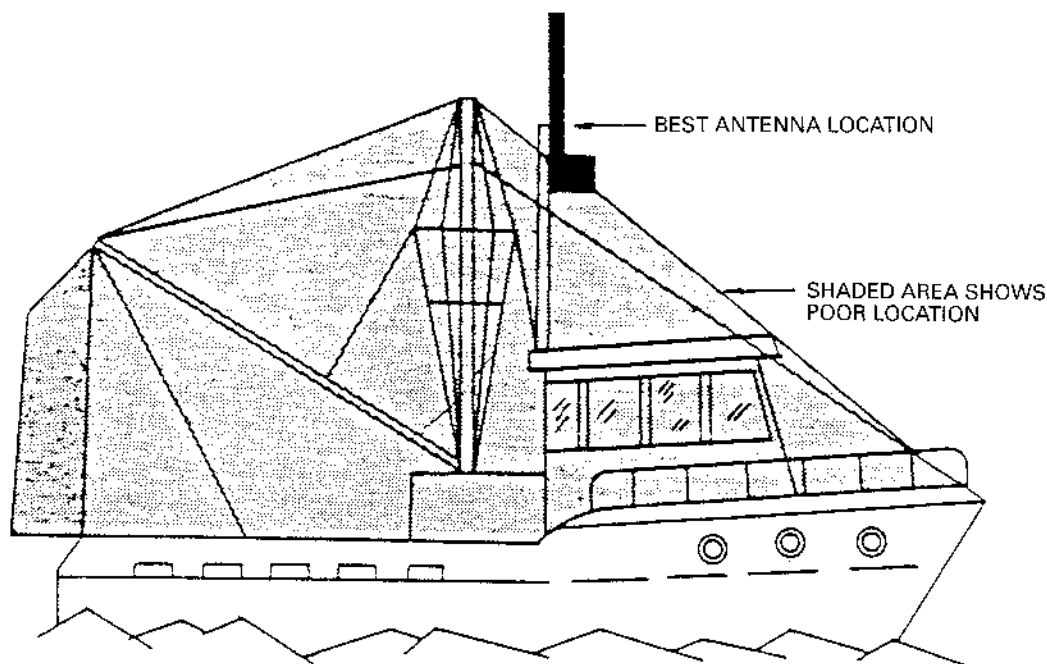
CAUTION

Selecting the Location of Antenna

The antenna should be mounted high up and in the clear so that it is not shielded by stacks, masts, bridge structures, or vertical stays. It should not be placed under horizontal wire antennas such as HF or MF communications antennas. The active antenna should be mounted away from stacks to keep heat, smoke and contaminating gases.

The antenna should be mounted vertically and in a location that is accessible for servicing. The active antenna should be separated as much as possible from the vessel's other antennas. In particular, try to obtain as much separation as possible from the HF and MF transmitting antennas to avoid damage to the receiver and loss of NAVTEX signal during communication transmissions. Also avoid placing the active antenna too close to other receiving antennas which may reradiate interference, such as radar or TV antennas.

Slow and/or incorrect cycle selection is sometimes caused by the antenna being mounted too close to metal objects. If there are several possible antenna locations, each can be evaluated by operating the receiver with the antenna placed temporarily in each location, and hearing receiving condition. The location with low noise and high signal level is the best location.



Typical Antenna Location

- 1) To connect 50 Ω antenna

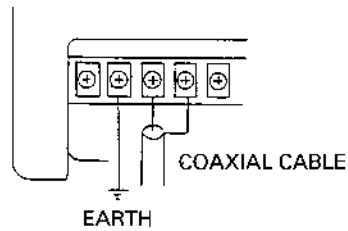


Fig. 11

- 2) To connect the dedicated active antenna, NAW-300A

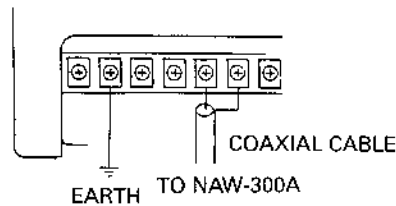


Fig. 12

- 3) To connect the wire antenna etc.

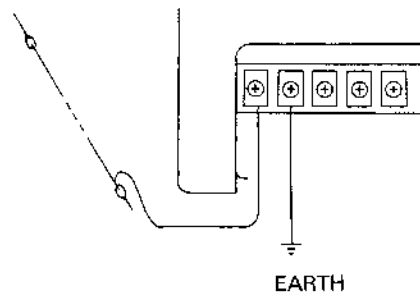


Fig. 13

3.3.3 BK (Key)

This terminal is required the voltage of 12 to 24 volts DC to terminal BK for making the relay contacts of the antenna input circuit off when it is required as a keying control to avoid heavy RF power inducing to the input circuit of main unit.

The necessary currents for driving the relay circuit is approximately 11 mA or 23 mA under the voltage of 12 volts or 24 volts respectively.

Note: This control is not necessary when NAW-300A is used.

CHAPTER 4

MAINTENANCE

4.1 SELF-DIAGNOSTIC TEST

4.1.1 Procedure

- Press **TEST** key.

The test is automatically done by pressing **TEST** key. The output of internal test signal generator is input into the RF input circuit of the receiving module to make up an internal self-diagnostic loop. The result is printed out. Most of the parts of the internal circuits will be checked by the above test when the test is done.

The following messages might be printed out:

```
----- Press "AL OFF" -----  
----- Self Test End -----  
  
----- ZCZC AB00 PAGE 1 -----  
THE QUICK BROWN FOX JUMPS OVER THE LAZY  
DOG 1234567890.,?()=/%+  
NNNN  
----- End of Message CER=0.0% -----  
----- Overall Test Start -----  
ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890.:;  
abcdefghijklmnopqrstuvwxyz.,=+*%  
----- Printer Test Start -----  
----- Main Processor : Good -----  
----- 518KHz Receiver : Good -----  
----- Self Test Start -----
```

- The audible alarm is started to sound....*Note*

- Press **AL OFF** key.

Note: The audible alarm is not started to sound under indicating ALARM DIS.

4.1.2 Receiver Test

The test result is printed out with one of the following comments:

1)

```
----- 518KHz Receiver : Good -----
```

Receiver is good condition.

2)

----- 518KHz Receiver : -----
Need Adjustment of RV1

It is necessary to adjust RV1 according to Para. 4.8.

3)

----- 518KHz Receiver : Failed -----

Replace CMN-2300A Demodulator according to Para. 4.4.

4.1.3 Main Processor Test

The test result is printed out with one of the following comments:

1)

----- Main Processor : Good -----

Main Processor is good condition.

2)

----- Main Processor : Failed -----

Replace CDJ-2300B Main processor according to Para. 4.5.

4.1.4 Printer Test

CDG-2300A Printer interface is normal when the print result is same as the following:

ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890-?@
abcdefghijklmnopqrstuvwxyz().,=+*%

Otherwise, replace CDG-2300A Printer interface according to Para. 4.6.

CAUTION

When the powerful RF interference is being input to the antenna terminal, there may be a case that the self-diagnostic test cannot be done properly.

Therefore, care should be taken to the sound from loudspeaker as there is no interferences to the antenna terminal.

4.2 REMOVING OF CABINET

- 1) Untighten screws ① and ② and remove the rear cover ③.
- 2) Remove the wiring if necessary.
- 3) Untighten screws ④, ⑤, ⑥ and ⑦.
- 4) As holding the both sides of cabinet with both hands as illustrated, press the terminal ⑨ with the thumb and remove the cabinet ⑧.

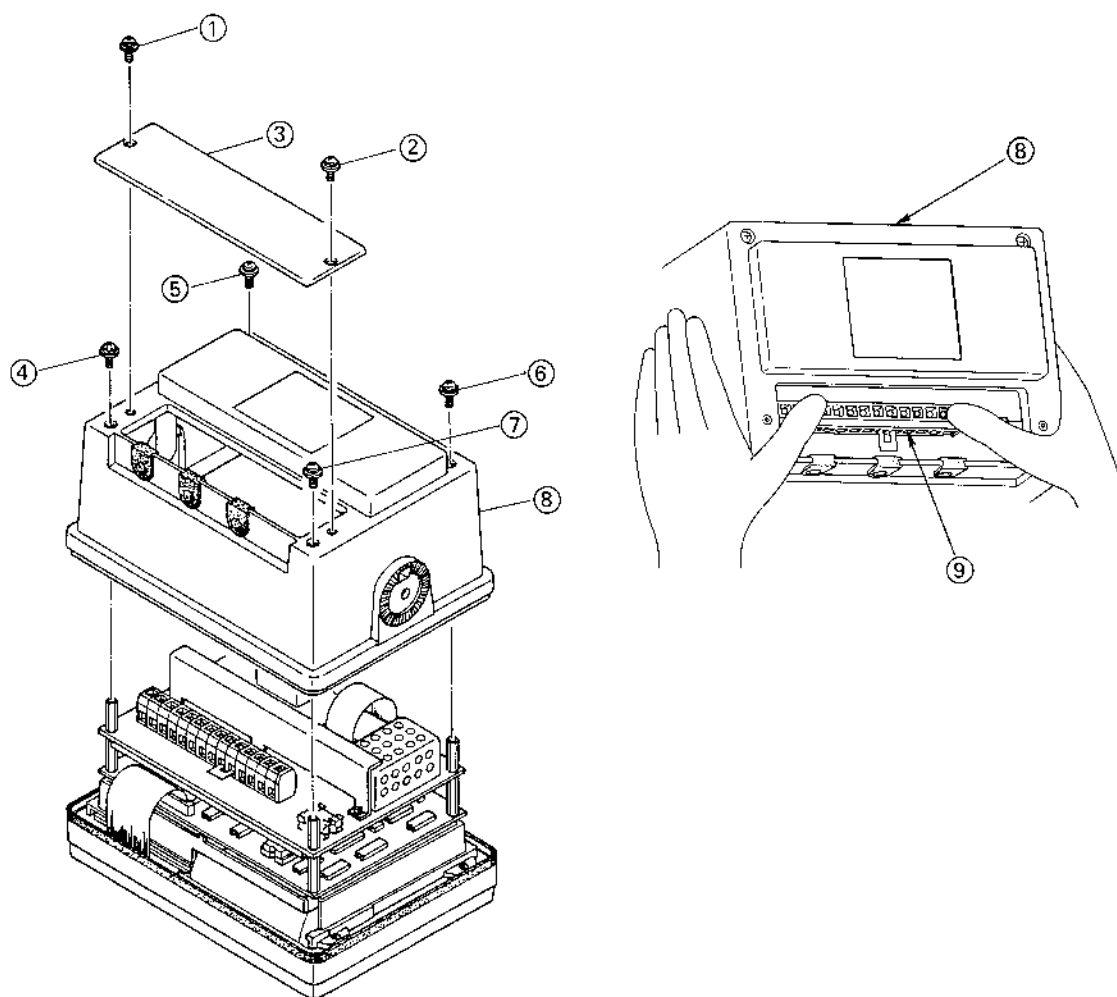


Fig. 14

4.3 REPLACEMENT OF FUSE

- 1) Remove the rear cover. (Refer to para. 4.2.)
- 2) Remove the blown fuse and replace it by good one. (See Fig. 15 below.)

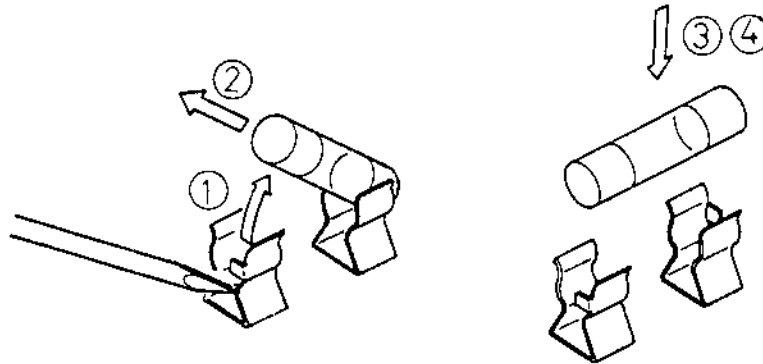


Fig. 15

- ① Raise one end with a slender tool like narrow tip screw driver.
- ② Pull out the fuse.
- ③ Put a new fuse on the fuse holder.
- ④ Push down the fuse to insert securely into the fuse holder.

Note: Fuses other than MF51NN-3A (3A, normal blow type) shall not be used.

CAUTION

To replace a fuse, pay attention not to cause short circuit of fuse holders for F1, F2 by touching with tip of screwdriver or fuse.

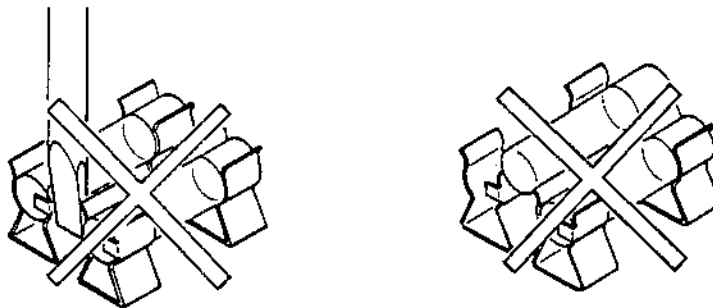


Fig. 16

4.4 REPLACEMENT OF CMN-2300A DEMODULATOR (Refer to Fig. 17)

- 1) Remove the cabinet. (Refer to para. 4.2.)
- 2) Pull out the cable 1 from the connector 2.
- 3) Pull out the connector 3 from the connector 4.
- 4) Remove spacers 5, 6, 7 and 8.
- 5) Remove Demodulator 9 and replace it by new one.
- 6) Fix spacers 5, 6, 7 and 8.
- 7) Insert the connector 3 to the connector 4.
- 8) Insert the connector 1 to the connector 2.
- 9) Fix the cabinet to the main unit. (Refer to para. 4.2.)

4.5 REPLACEMENT OF CDJ-2300B MAIN PROCESSOR (Refer to Fig. 17)

- 1) Remove the cabinet. (Refer to para. 4.2.)
- 2) Remove the Demodulator. (Refer to para. 4.4.)
- 3) Remove the shield cover 10.
- 4) Pull out the cable 15 from the connector 16.
- 5) Pull out the cable 17 from the connector 18.
- 6) Pull out the cable 19 from the connector 20.
- 7) Pull out the cable 21 from the connector 22.
- 8) Pull out the cable 23 from the connector 24.
- 9) Remove spacers 11, 12, 13 and 14.
- 10) Remove old Main Processor 25 and replace it by new one.
- 11) Fix spacers 11, 12, 13 and 14.
- 12) Insert the connector 23 to the connector 24.
- 13) Insert the cable 21 to the connector 22.
- 14) Insert the cable 19 to the connector 20.
- 15) Insert the cable 17 to the connector 18.
- 16) Insert the cable 15 to the connector 16.
- 17) Fix the shield cover 10 to the spacers 11, 12, 13 and 14.
- 18) Fix the Demodulator 9. (Refer to para. 4.4.)
- 19) Fix the cabinet to main unit. (Refer to para. 4.2.)

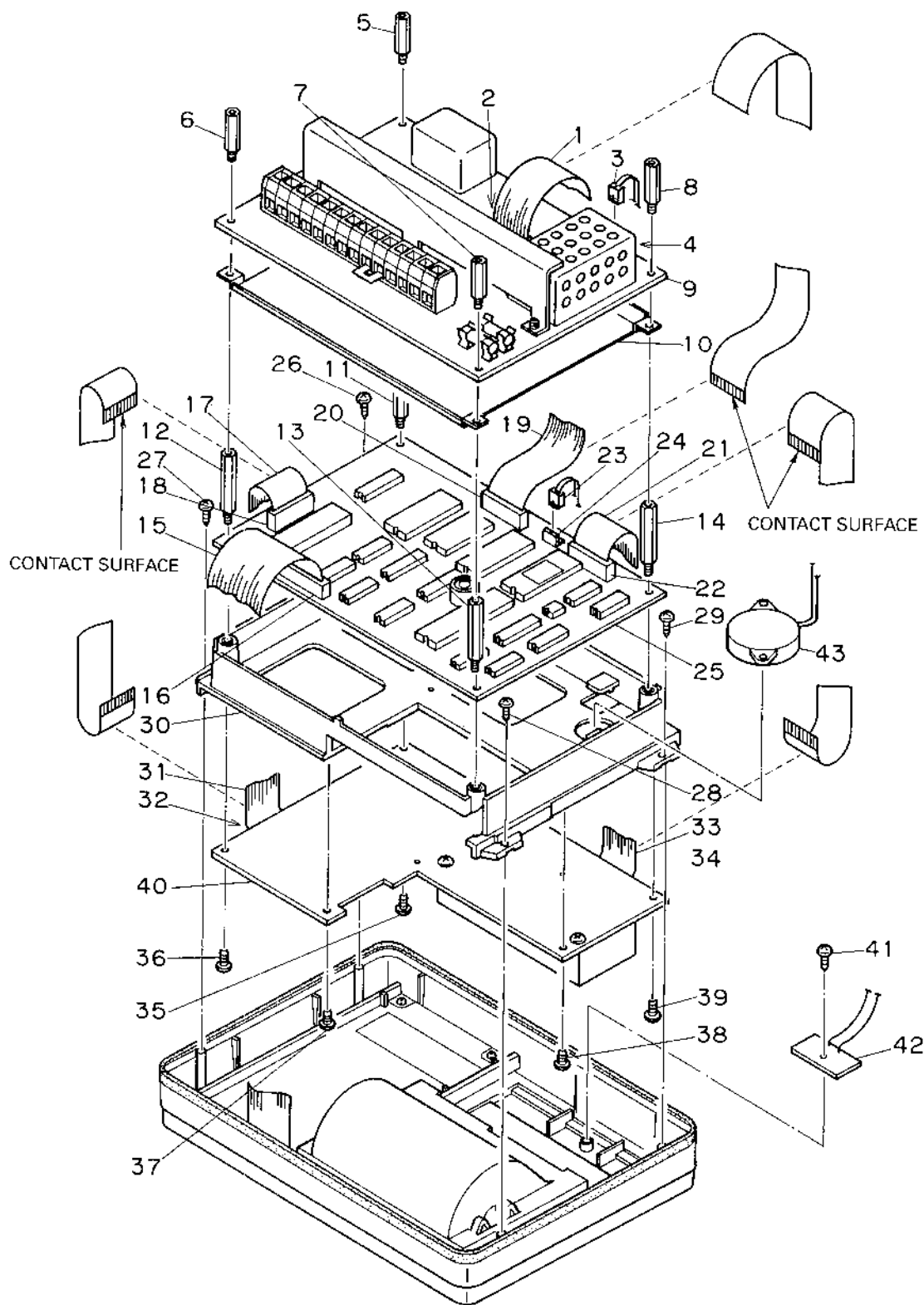


Fig. 17

4.6 REPLACEMENT OF CDG-2300A PRINTER INTERFACE (Refer to Fig. 17)

- 1) Remove the cabinet. (Refer to para. 4.2.)
- 2) Remove the Demodulator 9. (Refer to para. 4.4.)
- 3) Remove the Main processor 25. (Refer to para. 4.5.)
- 4) Loosen screws 26, 27, 28, and 29, and remove the mounting base 30.
- 5) Pull out the cable 31 from the connector 32.
- 6) Pull out the cable 33 from the connector 34.
- 7) Remove screws 35, 36, 37, 38, and 39.
- 8) Remove the old printer Interface 40 and replace it by new one.
- 9) Fix screws 35, 36, 37, 38, and 39.
- 10) Insert the cable 33 to the connector 34.
- 11) Insert the cable 31 to the connector 32.
- 12) Fix the mounting base 30.
- 13) Fix the Main processor 25. (Refer to para. 4.5.)
- 14) Fix the Demodulator 9. (Refer to para. 4.4.)
- 15) Fix the cabinet to the main unit. (Refer to para. 4.2.)

4.7 REPLACEMENT OF CML-2300A LIGHTING BOARD (Refer to Fig. 17)

- 1) Remove the cabinet. (Refer to para. 4.2.)
- 2) Remove the Demodulator 9. (Refer to para. 4.4.)
- 3) Remove the Main processor 22. (Refer to para. 4.5.)
- 4) Loosen screws 26, 27, 28 and 29 and remove the mounting base 30.
- 5) Remove a screw 41.
- 6) Remove the old Lighting Board 42 and replace it new one.
- 7) Fix a screw 41.
- 8) Fix the mounting base 30.
- 9) Fix the Main processor 22. (Refer to para. 4.5.)
- 10) Fix the Demodulator 9. (Refer to para. 4.4.)
- 11) Fix the cabinet to the main unit. (Refer to para. 4.2.)

4.8 ADJUSTMENT OF RV1 OF CMN-2300A DEMODULATOR

As a result of self-diagnostic test, if the following error message is printed out on the printer, follow steps below to adjust the demodulator:

----- 518Kz Receiver : -----
Need Adjustment of RV1

4.8.1 Method Using Oscilloscope

- 1) Remove the cabinet of the NCR-300A. (Refer to para. 4.2.)
- 2) Connect the power supply, and turn power on.
- 3) Connect the probe of the oscilloscope to pin 7 of IC2 on CMN-2300A to monitor the demodulated waveform.
- 4) When 518 kHz NAVTEX signal can be received clearly, connect the antenna and monitor the waveform. Otherwise, press the **TEST** key to perform self-diagnostic test, and monitor the waveform during execution of overall test.
- 5) The demodulated waveform is a rectangular wave with the width of 10 msec. Adjust RV1 so that the duration of the shortest waveform may be 10 msec. (See Fig. 18.)
- 6) Press **TEST** key to check a message:

----- 518KHz Receiver : Good -----

- 7) Mount the cabinet properly.

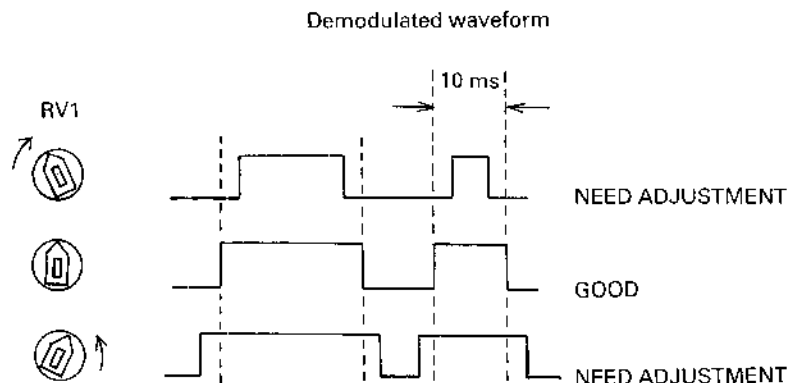


Fig. 18 State of RV1 and demodulated waveform

4.8.2 Method Not Using Oscilloscope

- 1) Remove the cabinet of the NCR-300A. (Refer to para. 4.2.)
- 2) Connect the power supply, and turn power on.
- 3) As shown in Fig. 19, the position of the variable resistor RV1 is correspondent to the demodulated waveform during self-diagnostic test to seek the point ②. Where the message:

----- 518KHz Receiver : Good -----

is changed to:

----- 518Kz Receiver : -----
Need Adjustment of RV1

Similarly, find the point ④ at the opposite side. Where the message:

----- 518KHz Receiver : Good -----

is changed to:

----- 518Kz Receiver : -----
Need Adjustment of RV1

If the position of RV1 exceeds from the point ① or ⑤ too far, a message:

----- 518KHz Receiver : Failed -----

is printed out. The RV1 should be fixed at the intermediate position ③ between the points ② and ④ where the self-diagnostic test result is good. Therefore it should be adjusted little by little until the intermediate position is found out.

4) Mount the cabinet properly. (Refer to para. 4.2.)

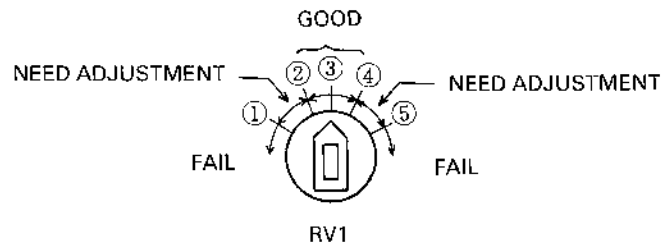


Fig. 19

4.9 CORRECTING PAPER JAMMING

If paper is jammed near the printer head when printing paper is loaded, remove the jammed paper and load the printing paper again by the following procedure:

Be careful because the printer will fail if the **FEED** key is continuously pressed under the printing paper jammed.

- 1) When you find paper jamming, turn off the power immediately.
- 2) Open the Paper Cover (Fig. 20-2), and cut off the printing paper.
- 3) After removing the power supply, disassemble the main unit, and remove the PRINTER I/F PCB according to para. 4.6.
- 4) Taking care not to damage the mechanical parts and printer head, pull out the jammed paper from the printer on the printer I/F PCB by hands.
- 5) Reassemble the main unit to the original state. (Refer to para. 4.6.)

4.10 MECHANICAL PARTS LIST (Refer to 5.1 MECHANICAL DETAILS)

Location	Description	JRC P/N	Q'ty
1	Bezel Assy consisting of:	MPBC07395	1
1a	Front Bezel	MTV000307	
1b	Paper Cutter	MTV000308	
1c	Packing, Rubber	MTT023560	1
2	Paper Cover	MTV000309	1
3	Cabinet	MTV000310	1
4	Mounting Base	MTV000311	1
5	Switch Assy consisting of:		
5a	Membrane Switch	6HCAF00039	1
5b	Switch Plate	MTV000312	1
6	Rear Cover	MTV000313	1
7	Packing, Rubber	MTT023561A	1
8	Gasket	MTT023562	3
9	Center Shaft	MTH004065	1
10	Demodulator PCB Assy	CMN-2300A	1
11	Shield Cover	MTB159034	1
12	Main Processor PCB Assy	CDJ-2300B	1
13	Printer Interface Assy consisting of:		
13a	Printer Interface PCB Assy	CDG-2300A	1
13b	Printer	5ZZMM00004	1
13c	LCD	6WSAF00001	1
14	Lighting Board	CML-2300A	1
15	Speaker	5UBAX00010	1
16	Spacer	MTK005046	4
17	Spacer	MTK005047	4

Location	Description	JRC P/N	Q'ty
18	Bracket consisting of:		
18a	Bracket, Mounting	MTB159036	1
18b	Washer, Serration	MTV002834	2
19	Knob	BRFD00400	2
20	Logo Plate	MPNM12620A	1
21	Screw, Tapping	BRTG03479	10
22	Sems Screw	BSNC03008B	6
23	Screw, Tapping	BRTG03684	4
24	Thermal Printing Paper	5ZPCU00003	1

CHAPTER 5

DRAWINGS

5.1 MECHANICAL DETAILS

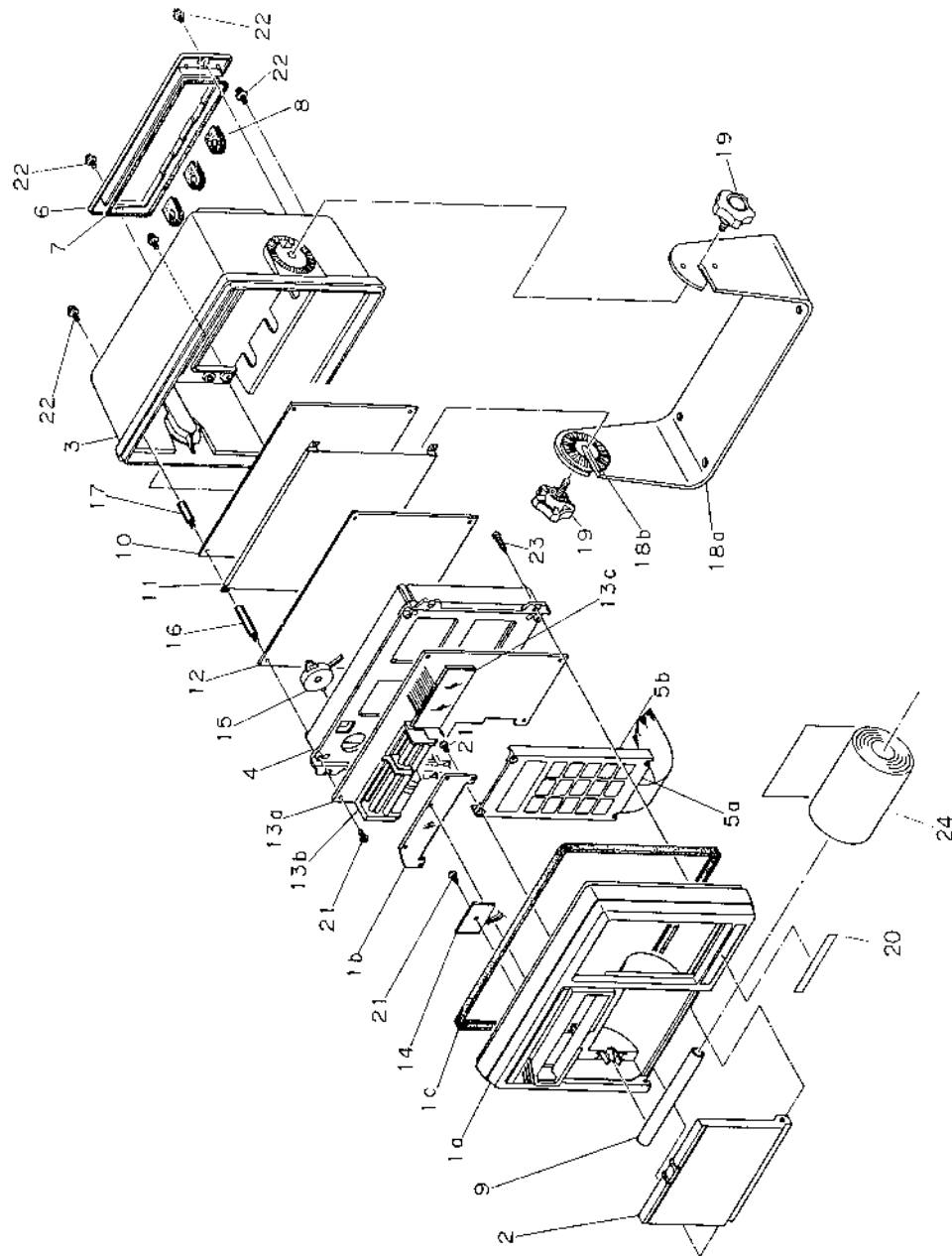


Fig. 20

5.2 OUTLINE

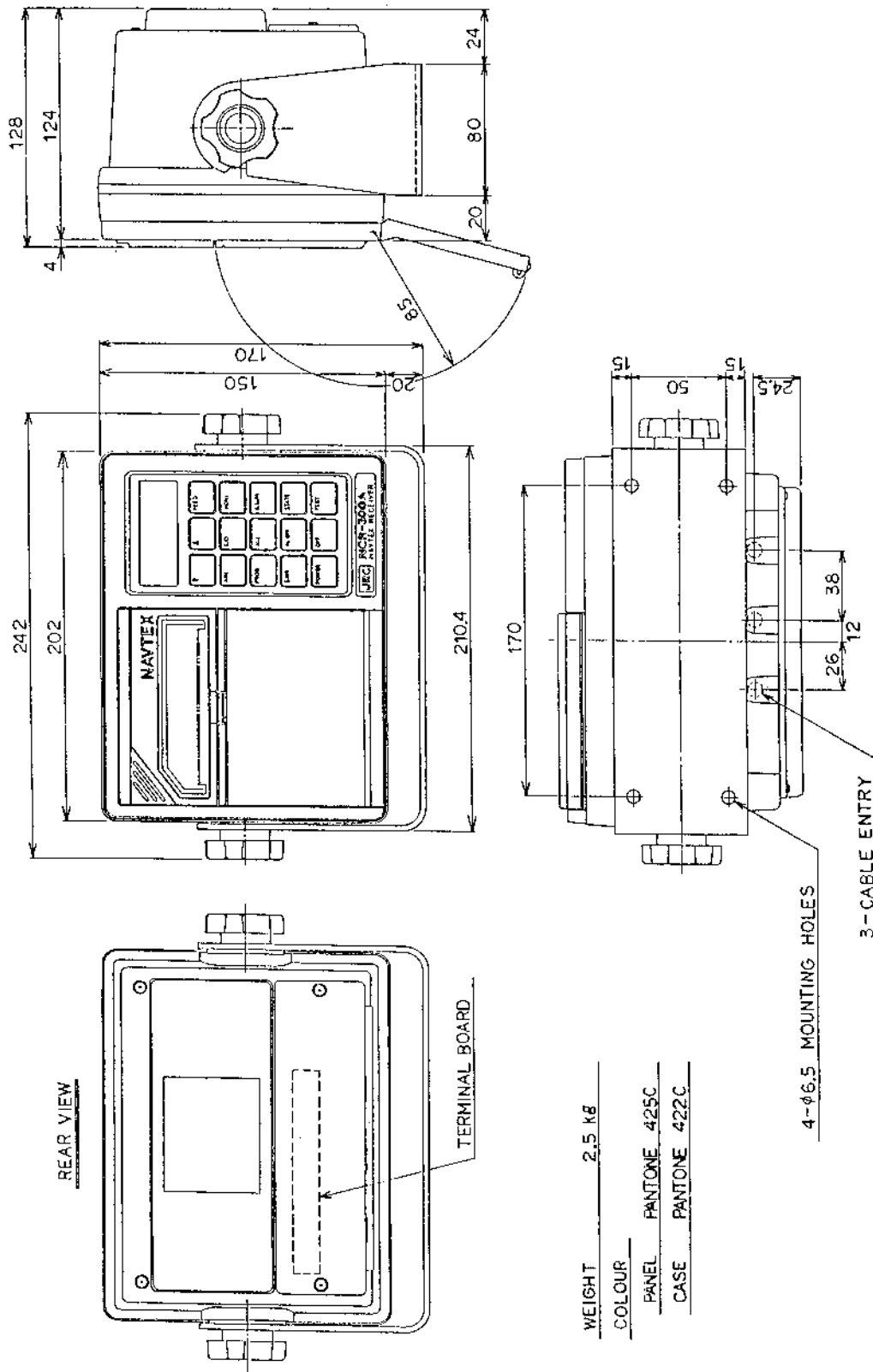


Fig. 21

5.3 SCHEMATIC DIAGRAM

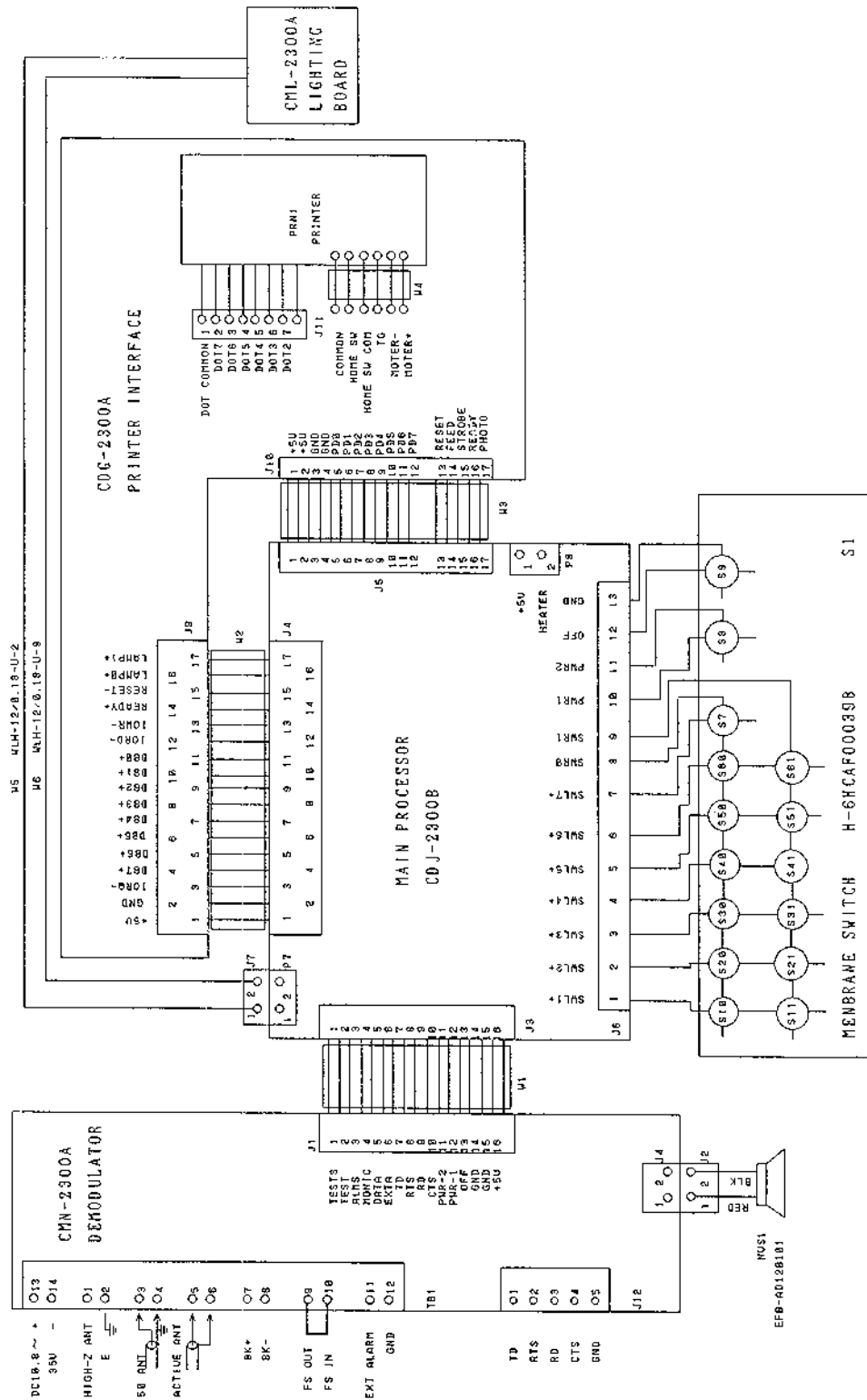


Fig. 22

For further information contact:



Since 1915

Japan Radio Co., Ltd.

**HEAD OFFICE &
SALES DEPT.**

Akasaka Twin Tower (Main),
17-22, Akasaka 2-chome, Minato-ku,
Tokyo 107-8432 JAPAN
Phone: +81-3-3584-8711
Fax : +81-3-3584-8715
Telex : 0242-5420 JRCTOK J

MAIN PLANT

1- 1, Shimorenjaku 5-chome, Mitaka-shi,
Tokyo 181-8510 JAPAN
Phone: +81-422-45-9111
Fax : +81-422-45-9110
Telex : 02822-351 JRCMTK J