FURUNO

OPERATOR'S MANUAL

NBDP TERMINAL

MODEL DP-5

(For Maritex Operation)

This manual is applicable to the sets having Program Version No. 2.02 (See page 2-13.)

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⚠ SAFETY INSTRUCTIONS

"**DANGER**", "**WARNING**" and "**CAUTION**" notices appear throughout this manual. It is the responsibility of the operator and 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.

SAFETY INFORMATION FOR THE OPERATOR

WARNING

Do not open the cover of the equipment.

This equipment uses high voltage electricity which can shock, burn, or cause death. Only qualified personnel should work inside the equipment.

Do not dissasemble or modify the equipment.

Fire, electrical shock or serious injury can result.

Immediately turn off the power at the ship's mains switchboard if water or foreign object falls into the equipment or the equipment is emitting smoke or fire.

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

CAUTION

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

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

Do not place heater near the equipment.

Heat can melt the power cord, which can result in fire or electrical shock.

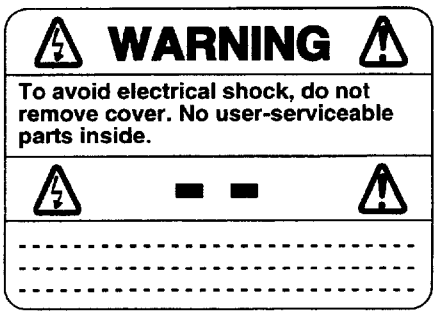
Do not operate the unit with wet hands.

Electrical shock can result.

Use the correct fuse.

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

WARNING Label attached



Name : Warning Label (1)
Type : 86-003-1011-0
Code No. : 100-236-230

SAFETY INFORMATION FOR THE INSTALLER

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.

Table of Contents

Foreword

Furuno Electric Company thanks you for selecting and purchasing the Furuno DP-5 NBDP (Narrow Band Direct Printing) Terminal. We are confident you will discover why the Furuno name has become synonymous with quality and reliability. To get maximum performance from your unit, please carefully read and follow the recommended procedures for installation, operation and maintenance.

The DP-5 is an advanced, microprocessor controlled NBDP Terminal designed to protect teleprinting communications from radio signal mutilation due to interference in the radio signal path. It provides dependable, fully automatic error-free telex communication with other ships, as well as with any telex subscriber, in full compliance with all GMDSS requirements for automatic radiotelex operation.

The microprocessor used in the DP-5 enables fully automatic operation of your radio station, including automatic frequency scanning, unattended reception and transmission of messages, automatic adjustment of transmitter frequency, and more. Operation is simplified by the use of menus: Simply move the cursor to items on the screen that you want to select.

The DP-5 provides a complete line of word processing facilities in its Text Editor, where you may create, edit and store multiple messages for later transmission.

FEATURES

- Simple operation by use of pop-up menus
- CRT displays information in easy-on-your-eyes white on black (color scheme is reversible)
- 3.5" floppy disk drive for storage of text, payroll lists, etc. on floppy disks
- Automatic frequency control and message handling permit unattended operation
- Real time printing of incoming messages
- Storage capacity for 100 user channels
- Remote control of a transceiver by commands entered via the keyboard
- Inputs for CIF or NMEA data – to display ship's L/L position, water temperature, and more on the CRT
- Built-in crypto device (scramble) for protected transmission and reception of confidential messages
- Fully automatic radiotelex by use of macro operation

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Specifications

1. Communications

Communication Mode	ARQ, FEC, DIRC (FSK)
Communication Protocol	CCIR Rec. 625, 476-3, 490, 491, 492
ID Code	4 unit, 5 unit and 9 unit
Line Code	4B/3Y fixed mark (International)
Modulation	AFSK
Tone Frequency (mark/space)	1615/1785 Hz, 1415/1585 Hz, 1815/1985 Hz (±0.5 Hz)
Tone Frequency Tracking Range	80 Hz
Line Input/Output	-30 dBm to + 10 dBm, 600 ohms balanced

2. Communication Features

- Timer transmission and receiving (maximum 10 stations)
- Scramble operation (maximum 5 different code sets)
- Frequency scanning (maximum 10 groups, 20 channels/group)
- Morse code conversion (transmit only)
- Storage for up to 100 user channels

3. Display

- 12" CRT display (white on black)
- 80 characters/line, 25 lines/screen
- Character construction 7 x 9 dots
- Selection shown in black on white

4. Ambient Temperatue Range	-15 to 55°C
5. Power Supply	Main Unit: 10-40 VDC (100/120/220/240 VAC operation by optional Rectifier PR-62), 40W Printer: 100/120/220/240 VAC (24 VDC operation by Inverter TR-2407), 33VA
6. Weight	Main Unit: 16 kg approx. Keyboard: 2 kg approx. Printer PP-500 (option): 5 kg approx. Rectifier PR-62 (option): 3 kg Inverter TR-2407 (option): 8.5 kg
7. Other Features	• Text editing screen • Floppy disk management • NMEA/CIF data input and display • Remote control of transceiver • Printing • Self-test
8. Equipment Connectable	
Transceiver	FS-8000, FS-5000, FS-1500/1550
Receiver	RV-118, RV-128, RV-107, RV-117
CIF/NMEA Data Input Terminal	LC-90, GP-500, FSN-70, etc.
9. Color	Cover: 2.5GY5/1.5 Panel: N-3

RADIOTELEX COMMUNICATION

General

Telex subscribers can attest to radiotelex as a reliable and efficient method for sending and receiving teleprinter connections. Telex subscribers, especially those who often use HF-band radio circuits, will also attest that the telex connection is subject to interference from a variety of sources, including atmospherics, fading and noise disturbance. This interference plays havoc with radio signals, resulting in the receiving of information different from the intended information. Thus a means must be provided to prevent mutilation of radio signals by interference on HF-band radio.

Radiotelex communication today owes its reliability and efficiency to error detection and correction. The CCIR (The International Radio Consultative Committee) defined both a constant-ratio code for automatic error detection and requirements for the error correction in Recommendation 476-3.

Code Description

The DP-5 employs a 7-element synchronous code providing $2^7 = 128$ combinations. Among these 128 combinations, there are 35 constant-ratio combinations having a ratio of 3 (Y) mark bits to 4 (B) space bits. This ratio is used to test the validity of each received character.

Of the 35 combinations, 32 are used for the required alphanumeric teleprinter signals. The remaining three 7-element codes are used exclusively for operational purposes. These are:

Idle Signal α (ARQ Mode), Phasing Signal 1 (FEC Mode)
Idle Signal β
RQ Signal (ARQ mode), Phasing Signal 2 (FEC Mode)

Transmission rate is 100 bauds. If the 4B/3Y ratio is disturbed due to interference, the output of the receiver is blocked to restrict the mutilated character from passing on to the teleprinter.

Frequency Shift

The frequency shift is 85 Hz with a center frequency of 1700 Hz, as specified in CCIR Recommendation 476-3.

Space Frequency..... 1700 + 85 = 1785 Hz
Mark Frequency..... 1700-85 = 1615 Hz

ARQ Mode (A-Mode)

Description

The ARQ (Automatic Re-transmission request, or Automatic Request for repetition) Mode allows private communications between any two stations using semi-duplex communication. Reception confirmation is done to assure that each character is received correctly. Since the two stations (automatically) exchange identities, this affords some degree of protection for confidential messages.

Traffic Exchange Sequence

In the ARQ mode two stations communicate directly with one another. One station sends information and receives controls signals, while the other station receives information and sends confirming controls signals. The first station is the ISS (Information Sending Station), and the second is the IRS (Information Receiving Station). These functions are interchangeable by a special control signal.

The station which initiates the call is the *Master Station (MS)*. The MS initiates the call by sending the selective identity code of the called station, consisting of an RQ signal and two traffic information signals, listening between blocks.

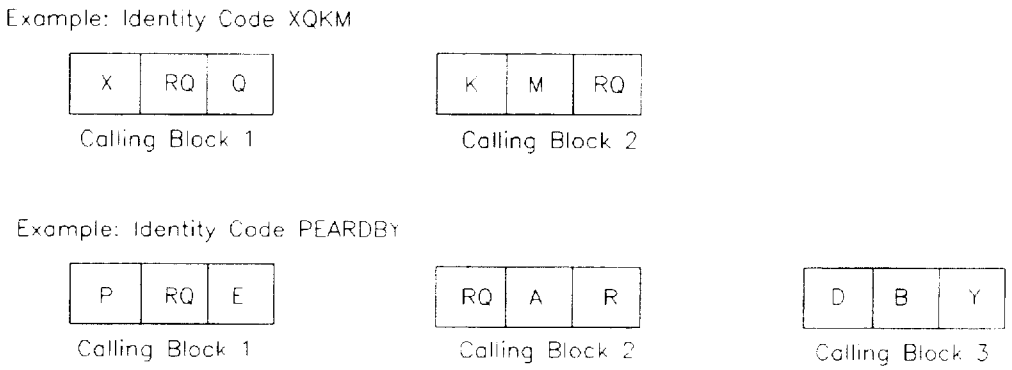


Fig. 1-1 Transmission of Identity Code

The *Slave Station (SS)* recognizes own identity code received and answers it is ready by sending a control signal. The calling station then initiates normal traffic.

The ISS sends information in blocks of three characters. Each character is sent at the rate of 100 bauds, amounting to 70 ms for one character or 210 ms for one character block. The block repetition cycle is 450 ms, so there is 240 ms during each cycle that the ISS is not sending. This time is taken up by propagation time from the ISS to the IRS, 70 ms for the IRS to send its service information signal, and the return trip back to the ISS.

The IRS listens between blocks and sends a control signal (CS1 or CS2) to request either the next block, or retransmission of the last block in the case of error. Request for retransmission may be repeated up to 32 times, until the completed block have been received error-free. After 32 times, the ISS automatically initiates a new call.

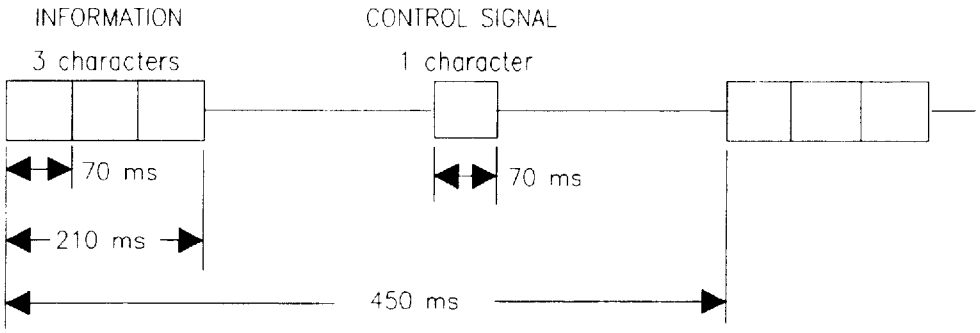


Fig. 1-2 ARQ Mode Traffic Exchange Timing

Once an entire message is received (error-free), a station may switch its function from the IRS to the ISS by means of a control signal (CS3). This change is done by either the ISS by the sequence of " Figure shift + ? ", or by the IRS operator by activating the "OVER" control. Upon receipt of CS3, ISS answers with a $\beta\alpha\beta$ block. This switches the ISS into IRS. However, the original Master and Slave stations' status remains unchanged, since the Master Station always controls the radio circuit.

Termination of Communication

Only the ISS may terminate the established circuit. It does this by sending three "idle signals α." The IRS and ISS exchange control signals, each reverting to standby after acknowledging each other's control signals. Then, the connection is cleared.

FEC Mode (B-Mode)

Description

The FEC mode is for one-way, uninterrupted transmission of messages, for example, weather forecasts and emergency bulletins, to no one particular station or stations. The sending station is known as the BSS (B-Mode Sending Station), the receiving station the BRS (B-Mode Receiving Station).

This mode uses a simple forward-error correcting (FEC) technique of sending each character twice at a 280 ms interval. The first transmission is termed DX (direct transmission), the second RX (repeated transmission).

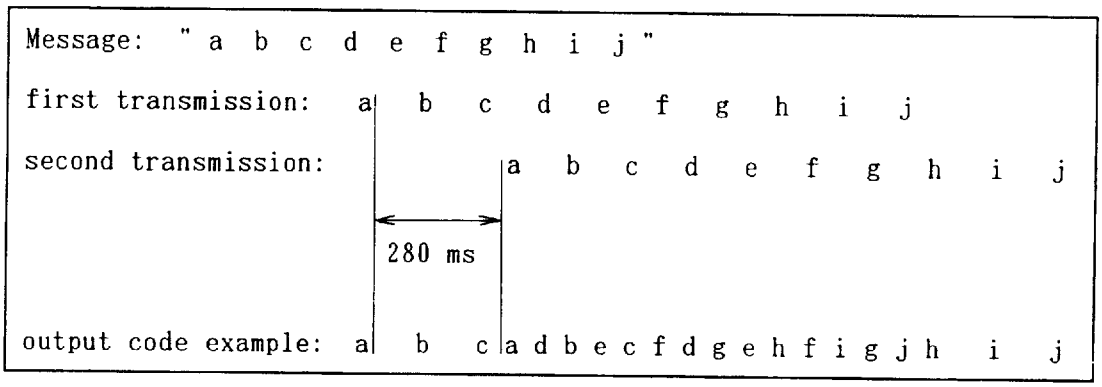


Fig. 1-5 FEC Mode Transmission Technique

The receiving station tests the DX and RX characters for adherence to the 4-mark/3-space constant ratio, and prints only unmutilated DX or RX characters, or prints a space if both are mutilated.

Another version of the FEC mode is the FEC-selective mode. This mode uses a call code for selective calling to one or more stations. Only those stations with the correct code will receive the data correctly.

Initiating a Call

When a BSS initiates a broadcast call it transmits synchronizing signals to align phasing of the BRS. Upon detection of this signal the BRS's are switched to the receiving condition and will remain in this condition until the completion of the message. If the mutilated character error rate exceeds a certain percentage, the BRS reverts to standby condition.

Termination of Communication

The sending station sends three consecutive idle signals α immediately after the last transmitted information signal in the DX position.

SYSTEM INTRODUCTION

General

The Furuno DP-5 Narrow Band Direct Printing (NBDP) Terminal consists mainly of a display unit and a keyboard. A printer is available optionally.

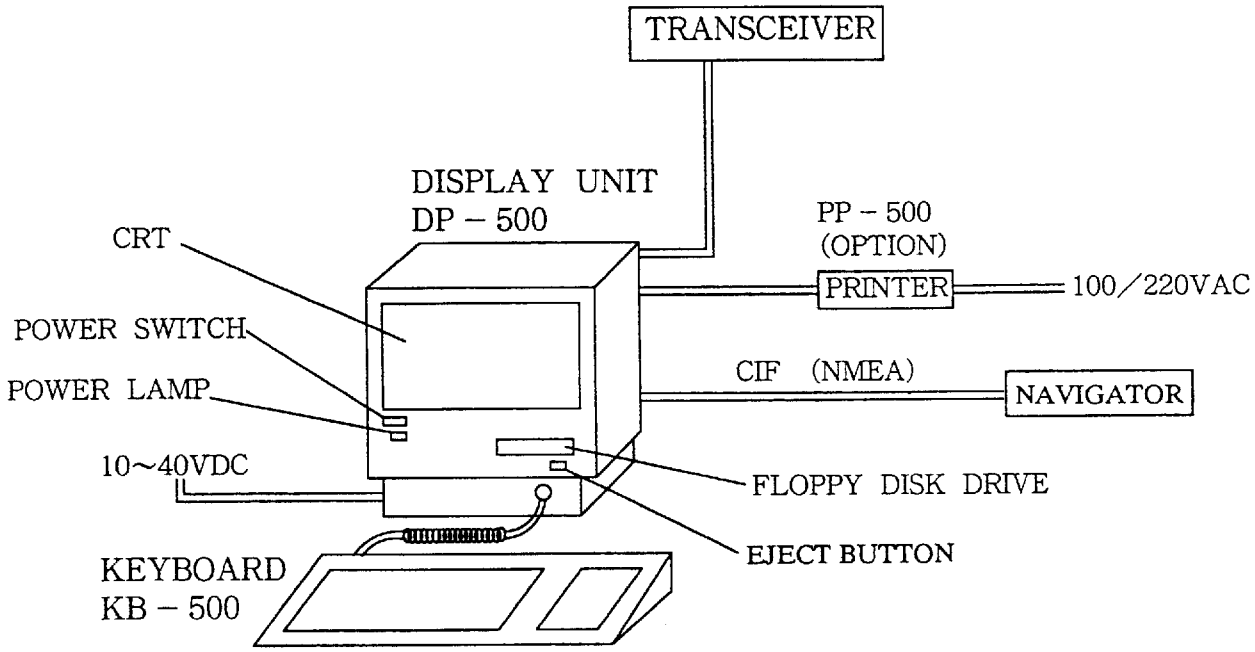


Fig. 2-1 System Configuration

Connected to a transceiver, the DP-5 functions as a narrow band printing terminal, transmitting and receiving radiotelex messages.

Display of ship's L/L position, speed, course, water temperature and depth on the CRT is possible when connected to a device or interface which outputs these data in CIF or NMEA data format.

Display Unit

The display unit contains a CRT and a floppy disk drive. Controls for power and CRT illumination are on the left-hand side of the unit. When you turn the power switch on, the (green) power lamp below the switch lights.

Screen color is available in two choices: normal, white on black, or reverse, black on white. For further details, see TEXT EDITOR PARAMETERS on page 3-12.

Floppy Disk Drive

The DP-5 provides a floppy disk drive for saving files to floppy disks. (Files can also be saved to an internal memory.) The type of floppy disk used is a (commonly available) 2DD type (double sided double density) 3.5" floppy disk.

Inserting and Removing a Floppy Disk

To set a floppy disk into the floppy disk drive, insert it such that the arrow on the disk is pointing forward and is on the left. Release hold when the eject button pops out, indicating the disk is properly inserted.

To remove a floppy disk, first confirm that the (orange) access lamp is off, then press the eject button. **Never remove a floppy disk while the access lamp is lit, or after turning the power off, since this may erase information stored on the disk.**

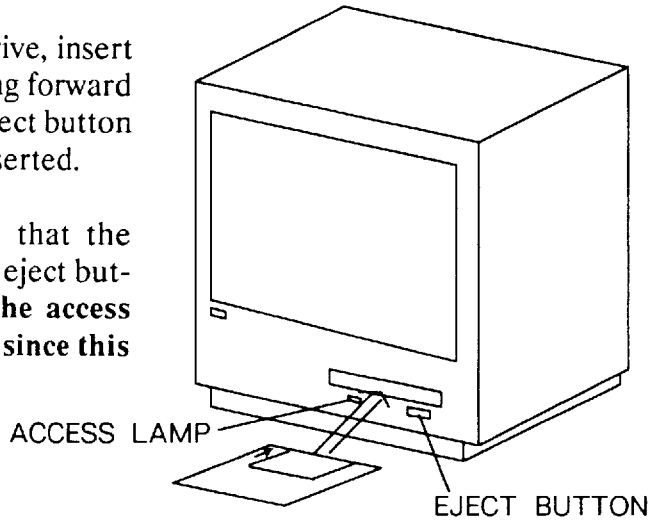


Fig. 2-2 Inserting a Floppy Disk

Care and Handling

Floppy disks must be handled with the utmost of care. Keep them away from direct sunlight, heat sources, and active gases. Do not place a disk near any magnetic field, since this erases all information stored on the disk. Television sets, telephones and large appliances are common objects which emit magnetic fields. Keep your disks at least a foot—preferably more—away from such devices. After use, replace the disk in its protective case and store it in a cool, clean place. You should always label your disks so you can know what you have stored on them and to help find the disk you need quickly.

Each floppy disk has a write protect tab which prevents accidental erasure of information stored on the disk. To disable writing to the disk, move the tab downward.

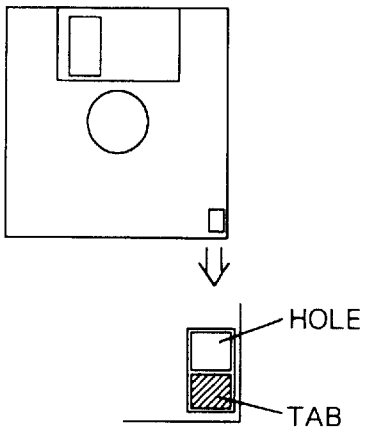


Fig. 2-3 Disk Write Protection Tab

Keyboard

The DP-5 provides a "IBM type" alphabet keyboard with cursor controls for operating the system. The keyboard is powered from the display unit through the supplied connection cable.

The DP-5 is operated from the keyboard, and is almost 100% keyboard controlled. Operation is simplified by the use of menus which you access by pressing a function key, numbered F1-F8 at the top of the keyboard. The figure below shows the function menu and its corresponding function keys.

NOTE: The function menus FILE, OPERATE, WINDOW, STATION, TERMINAL, EDITOR and SYSTEM appear in the highest level of illumination when the DUAL FONT feature is turned on in the TERMINAL menu. For further details see TERMINAL SETTINGS on page 3-12.

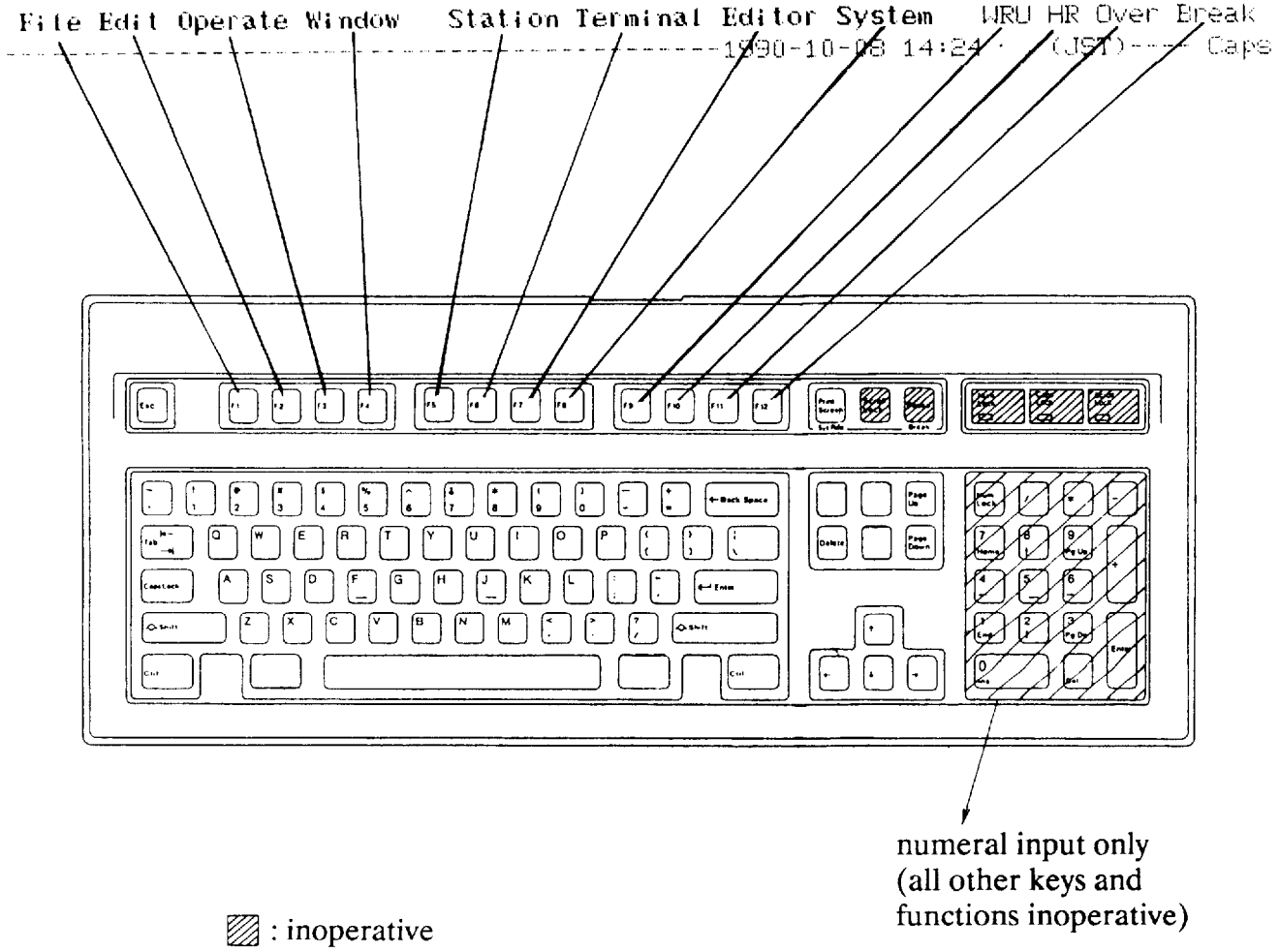


Fig. 2-5 Keyboard

Function Menus

The function menus, which you access by pressing the function keys at the top of the keyboard, control most operations of this unit. To familiarize yourself with each menu, turn the unit on and try operating the keys as you review this section, provided the unit has been installed.

Menu Conventions

Inverse Video

As you move the cursor down through a menu, each menu option, initially shown as white on black, inverses to black on white. This highlighting indicates that the item is available for selection.

Underline

The underline shows current selection on the menu screens. In the figure below, for example, the underline is beneath both MAIN (main memory) and RECEIVE, meaning that main memory is selected rather than disk memory and "receive" is selected rather than "send".

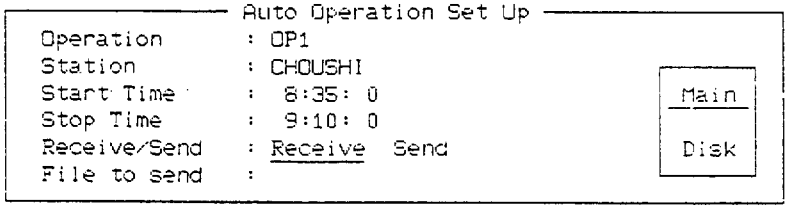


Fig. 2-6 The Underline

Keys You Will Commonly Use

FUNCTION:	Controls menu selection.
ENTER:	Terminates keyboard operation, or inserts a carriage return.
ESC:	Returns control to previous screen.
PAGE UP:	Goes to the previous page at edit screen.
PAGE DOWN:	Goes to the next page at edit screen. The above two keys are also used to view the contents of the communication buffer, which stores currently transmitted/received message.
CURSOR:	([←], [↑], [→], [↓]) Controls the cursor.
BACKSPACE:	Deletes the character to the left of the cursor.
CAPS LOCK:	Locks the keyboard for capital letters.
SHIFT:	Alternates between capital letters and small letters.
Ctrl + G:	Sounds on audible alarm to other party. (Press the keys simultaneously.)
PRINT SCREEN:	Prints contents of the current screen.

HOME: Moves the cursor to the top in an editing message.

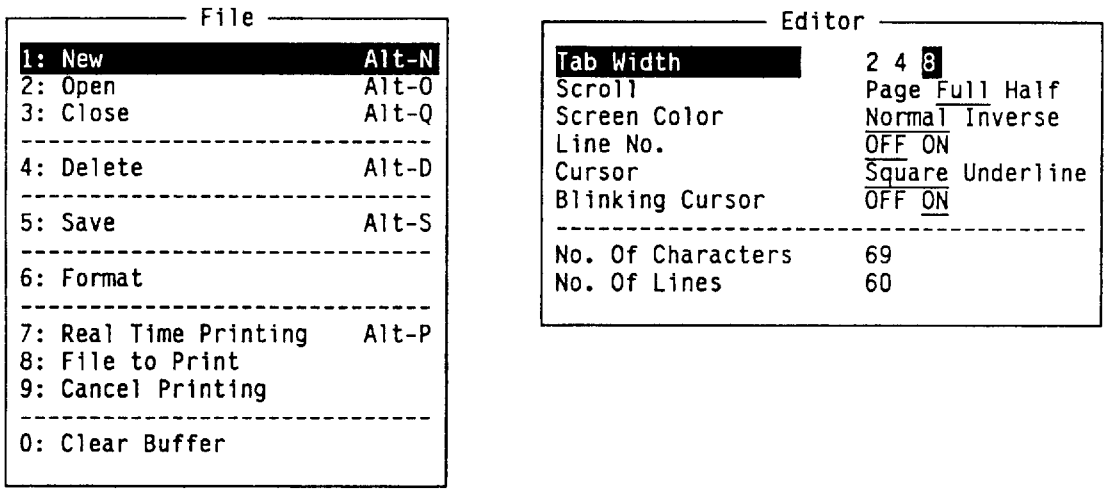
END: Moves the cursor to the bottom in an editing message.

ALT: Does the short-cut operation, combined with alphabet key.

INSERT: Works same as PASTE function.

Basic Operation

When a function key is pressed, the individual menu screen appears. The below shows the FILE menu and the EDITOR menu.



(a) (b)

Fig. 2-7

Numeric number is attached to each item of the menu for the menu screens used frequently as shown in the above figure (a). At this case, press numeric key you want to do then the item with numeric number will be executed. Instead of this method, the arrow keys and ENTER key can be used. Press the [↓] or [↑] key to select an item you want followed by the ENTER key.

For the menu without numeric number as shown in above figure (b), press the [↓] or [↑] key to select a desired item and then press the ENTER key to execute it.

Short Cut Key Operation

Short cut key operation is operative for some items of menus. Press an alphabetic key, holding down the [ALT] key. This is operative without pressing a function key. The short cut key operation is listed below.

Short Cut Key	
ALT + N	Same as New in File menu
ALT + O	Same as OPEN in File menu
ALT + Q	Same as CLOSE in File menu
ALT + D	Same as Delete in File menu
ALT + S	Same as SAVE in File menu
ALT + P	Same as REAL TIME PRINTING in File menu
ALT + X	Same as UNDO in Edit menu
DELETE	Same as in CUT in Edit menu
ALT + C	Same as in COPY in Edit menu
INSERT	Same as PASTE in Edit menu
ALT + A	Same as in SELECT ALL in Edit menu
ALT + F	Same as in SEARCH in Edit menu
ALT + R	Same as in REPLACE in Edit menu
HOME	Same as GOTO TOP in Edit menu
END	Same as in GOTO BOTTOM in Edit menu
ALT + L	Same as in GOTO LINE in Edit menu
ALT + V	Changes currently opened file on the CRT alternately.

Menu Description

FILE (function key F1)

The file menu controls the flow of information into and out of the DP-5. The figure below shows the file menu.

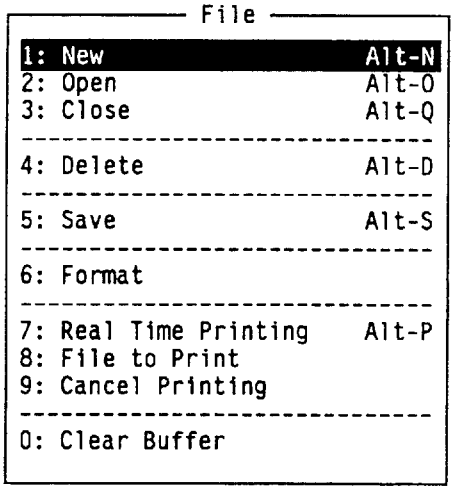


Fig. 2-8 File Menu

1: New — Opens a new file to create a message.

2: Open — Retrieves a previously stored file from the main memory or a floppy disk.

3: Close — Removes a file from a working area.

4: Delete — Deletes a file from the memory.

5: Save — Saves a file to the memory.

6: Format — Formats a floppy disk.

7: Real Time Printing — Turns real time printing (printing an incoming/outgoing message while it is being received/transmitted) on and off.

8: File to Print — Prints a file or the contents of the memory.

9: Cancel Printing — Stops the printer.

0: Clear Buffer — Clears both the screen and communication buffer memory.

EDIT (function key F2)

The edit menu allows you to cut, copy and paste text, search for words, position the cursor, etc. This function is operative at the message editing screen only.

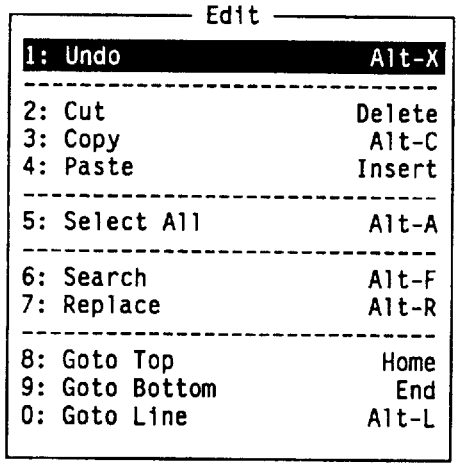


Fig. 2-9 Edit Menu

1: Undo — Cancels the last change (cut, copy or paste).

2: Cut — Removes the selected text and stores it in the paste buffer. (Previous text in the buffer is cleared.)

3: Copy — Copies the selected text and stores in the paste buffer. (Previous text in the buffer is cleared.)

4: Paste — Inserts the text stored in the paste buffer at the current location of the cursor.

5: Select All — Selects the entire current file for cut and copy.

6: Search — Searches a file for a character string.

7: Replace — Replaces a word with a different word or character string.

8: Goto Top — Brings the cursor to the top line of the current file.

9: Goto Bottom — Brings the cursor to last line of the current file.

0: Goto Line — Moves the cursor to the desired line in the current file.

OPERATE (function key F3)

The OPERATE menu controls transmitting and receiving.

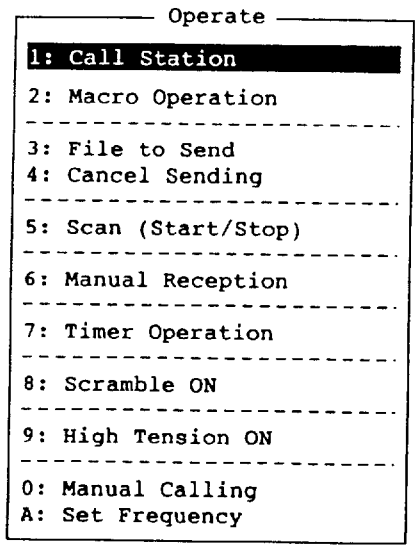


Fig. 2-10 Operate Menu

1: Call Station — Selects a station in the station list registered.

2: Macro Operation — Enables fully automatic operation.

3: File to Send — Selects a file for transmitting.

4: Cancel Sending — Stops sending a file during transmission.

5: Scan Start/ Stop — Starts and stops frequency scanning.

6: Manual Reception — Selects communication mode for reception; AUTO/ARQ/FEC/DIRC.

7: Timer Operation — Enables timer operation.

8: Scramble ON/OFF — Turns scramble (crypto) operation on and off.

9: High Tension ON/OFF — Turns on/off transmitter high voltage of Furuno make radio.

0: Manual Calling — Selects a mode for transmitting and sets ID number of other party for manual calling.

A: Set Frequency — Sets a transmission and reception frequencies for manual calling.

WINDOW (function key F4)

The window menu lets you display various data.

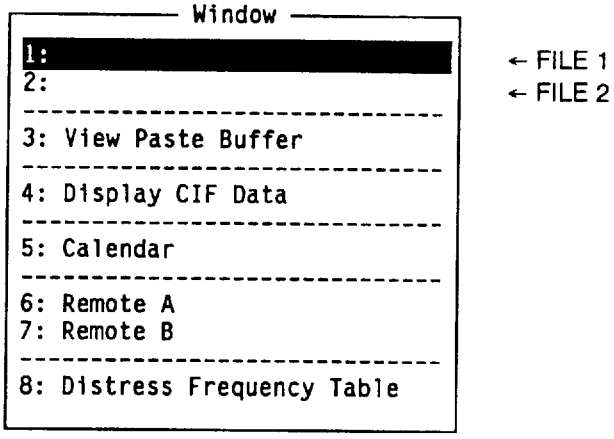


Fig. 2-11 Window Menu

FILE 1
FILE 2
Displays name of currently opened file(s).

View Paste Buffer
Displays the contents of the paste buffer memory. The paste buffer memory stores cut or copied text.

Display CIF (or NMEA) Data
Displays ships L/L position, speed, course, water temperature and depth when the DP-5 is connected to a device which can output this data in CIF or NMEA format.

Calendar
Displays desired calendar month and year.

Remote A/B
Entering commands to this screen enables remote control of a Furuno make radio transceiver connected to Remote A and Remote B terminal.

Distress Frequency Table
Displays all distress frequencies.

STATION (function key F5)

Selects communication conditions.

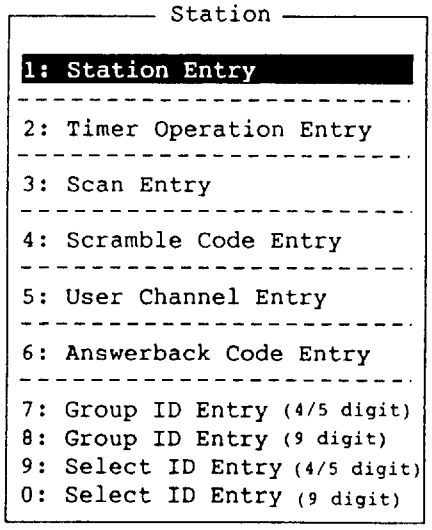


Fig. 2-12 Station Menu

1: Station Entry — Stores station list.

2: Timer Operation Entry — Sets parameters for timer operation.

3: Scan Entry — Creates scan groups for frequency scanning.

4: Scramble Code Entry — Creates scramble code groups for scramble (crypto) operation.

5: User Channel Entry — Registers user channels.

6: Answerback Code Entry — Registers own vessel's answerback code

7: Group ID Entry (4/5 digit)
8: Group ID Entry (9 digit) — Registers own vessel's group ID code.

9: Select ID Entry (4/5 digit)
0: Select ID Entry (9 digit) — Registers own vessel's selective ID code.

TERMINAL (function key F6) ..... Refer to page 10-5.

The TERMINAL menu sets communication conditions.

Terminal

Set Up	Lock Change Default
Rx MSG Save	OFF Main Disk
Active File Auto Send	OFF ON
Signal Tracking	OFF ON
Edit before Sending	NO YES
ARQ Error Count	OFF ON
Communication Time	OFF ON
Dual Font (Bold: Sending)	OFF ON
Echo	OFF ON
Sending Volume display	OFF ON
Comm. Status display	OFF ON
ARQ/FEC Center Freq	1500 1700 1900 0 (Hz)
Shift Freq	+ 85 + 0 (Hz)
DIRC Center Freq	1500 1700 1900 0 (Hz)
Shift Freq	+ 85 + 0 (Hz)
Rate (wpm)	60 66 75 100 132
CW Mod Freq	1615 1785 (Hz)
Rate (wpm)	10 12 14 16 18 20 22 24 26 28
Line Out Level (dBm)	0 (-30 – 10)
Remote A Mode	OFF RCVR XMT RT DSC
Rate (baud)	300 600 1200 2400 4800 9600
Start Bit	1 Bit
Data Bit	7 Bit 8 Bit
Stop Bit	1 Bit 2 Bit
Parity Bit	Even Odd None
Delimiter	CR CR + LF LF
MIF Tune	OFF ON
Freeze	OFF ON
AGC	OFF ON
Remote B Mode	OFF RCVR XMT RT DSC
Rate (baud)	300 600 1200 2400 4800 9600
Start Bit	1 Bit
Data Bit	7 Bit 8 Bit
Stop Bit	1 Bit 2 Bit
Parity Bit	Even Odd None
Delimiter	CR CR + LF LF
MIF Tune	OFF ON
Freeze	OFF ON
AGC	OFF ON
CIF/NMEA Mode	CIF NMEA
CIF Rate (baud)	600 1200 2400 4800

Fig. 2-13 Terminal Menu

EDITOR (function key F7)

The EDITOR menu formats the text editor screen.

```
                    Editor
Tab Width           2 4 8
Scroll              Page Full Half
Screen Color        Normal Inverse
Line No.            OFF ON
Cursor              Square Underline
Blinking Cursor     OFF ON
-----------------------------------
No. Of Characters   69
No. Of Lines        60
```

Fig. 2-14 Editor Menu

SYSTEM (function key F8) ..... Refer to page 10-9.

The SYSTEM menu selects system settings.

```
                              System
Set Up                        Lock Change Default
-------------------------------------------------
Monitor                       OFF   Line In Line Out
   Line In Level              0  1  2  3  4  5  6  7
   Line Out Level             0  1  2  3  4  5  6  7
   Beep Level                 0  1  2  3  4  5  6  7
CRT Economy Mode              OFF ON
File Partial View             OFF ON
* Slave Delay                  5 msec (0-50 msec)
* BK Timing PreTone           10 msec (0-100 msec)
*          PostTone            0 msec (0-20 msec)
* Mute Timing PreBK           0 msec (0-20 msec)
*            PostBK           0 msec (0-20 msec)
Reception Alarm               OFF ON
Time System                   OFF UTC SMT JST
Time & Date                   1990/ 1/ 1/ 20: 0
* Printer                     PP-500 OTHER
Header File Name              OFF ON
            Time              OFF ON
Footer                        OFF ON
* Language                    Normal Norway Sweden UK (]\[)
-------------------------------------------------
Self Test
-------------------------------------------------
Version No.                   Ver. 2.xx
Modem Version No.             Ver. 1.10
```

Fig. 2-15 System Menu

F9 (WRU: Who Are You?)

This key, when pressed in the ARQ mode, requests other station's answerback code.

F10 (HR: Here Is)

This key, when pressed in the ARQ mode, sends your vessel's answerback code.

F11 (OVER)

This key, when pressed in the ARQ mode, changes the direction of traffic; the information receiving station becomes the information sending station, the information sending station becomes the information receiving station.

F12 (BREAK)

This key disconnects the communication line.

PREPARATIONS

General

This section provides the procedures for preparing the DP-5 for transmitting and receiving. You will need to;

1) Register your vessel's ID code and answerback code
2) Create a list of stations
3) Provide parameters for timer operation
4) Enter frequency scanning groups
5) Prepare a scramble table (if required)
6) Register user channels
7) Format the text editor screen
8) Enter terminal settings
9) Enter system settings

Most of the system and terminal setting should be done by a installation engineer.

All other items are found in the STATION menu. Press function key **F5** to display the STATION menu.

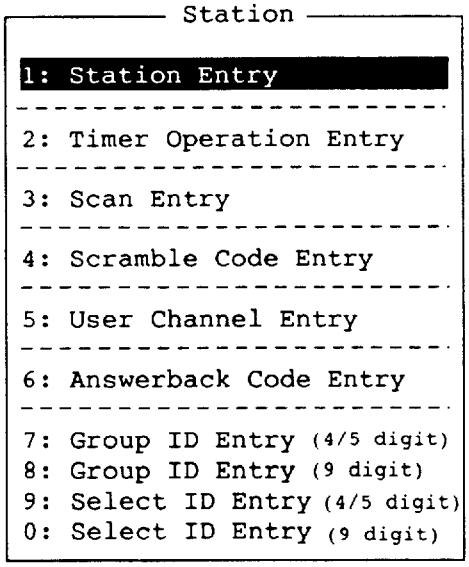


Fig. 3-1 Station Menu

Answerback Code & ID Code

Enter your vessel's answerback code and ID code as follows.

CAUTION

The answerback and ID code numbers can be written only once; be sure to enter the codes correctly.

Answerback Code

Procedure

1. Press function key **F5** and then the [6] key. The display something like Fig. 3-2 appears. (To select a menu you want, the [↓] or [↑] keys followed by the ENTER key can be used instead of a numeric key.)

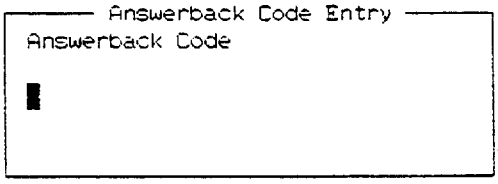


Fig. 3-2 Answerback Code Entry Screen

2. Enter your vessel's answerback code (max. 20 characters, including spaces). Press the **ENTER** key. The prompt OK/CANCEL asks for verification of data. If correct, press the **ENTER** key again.

Example

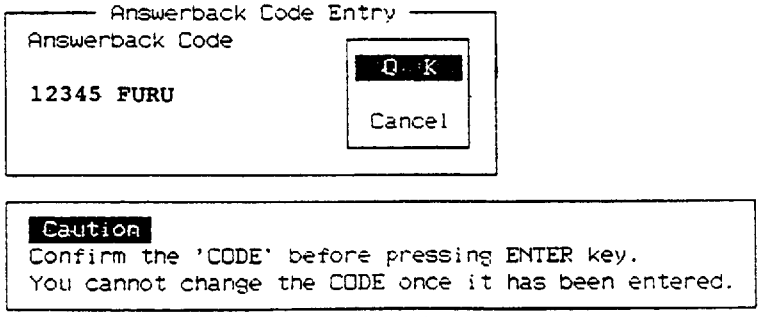


Fig. 3-3 Confirmation message

3. For final verification of the data, the above CAUTION appears. If correct, press the **ENTER** key again, then the registration of the answerback code is completed.

NOTE: Form of answerback depends on coast station. Some request ship name and/or callsign.

ID Code

Procedure

1. Press function key **F5** and then the [7], [8], [9] or [0] key to enter the Group ID Code (4 or 5 digits), Group ID Code (9 digits), Select ID Code (4/5 digits) or Select ID Code (9 digits) respectively.

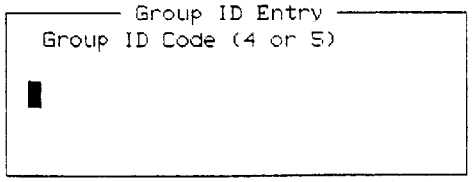


Fig. 3-4 ID Code Screen

2. Enter group ID or select ID. Then, press the **ENTER** key. A prompt asks for verification of data. If correct, press the **ENTER** key.

Example

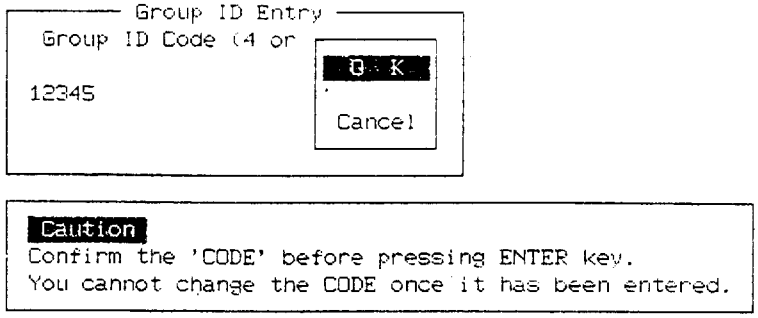


Fig. 3-5 Confirmation Message

3. For final verification of the data, the above CAUTION appears. If correct, press the **ENTER** key again, then the registration of the ID code is completed.

Station List

The station list provides abbreviated dialing with storage for up to 50 stations, one frequency pair (RX and TX) per station. For stations which have more than one frequency pair, you might add a suffix to the station name. For example, station name FURUNO followed by -1, -2, -3, etc. for each frequency pair required.

Procedure

1. Press function key **F5** followed by the [1] key. The STATION ENTRY screen appears on the CRT.

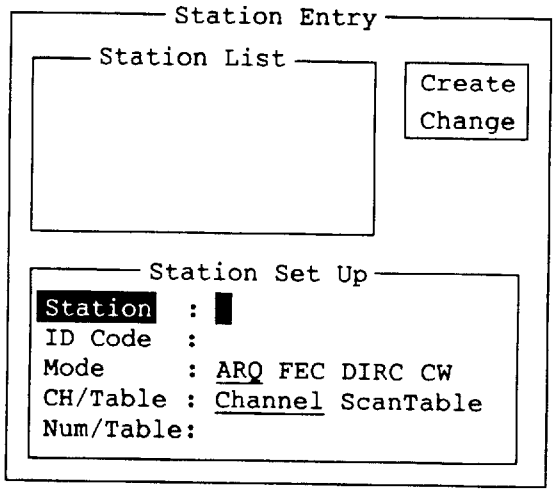


Fig. 3-6 Station Entry Screen

2. On the right-hand side on the screen you should see CREATE and CHANGE, and CREATE will be underlined. If not, place underline below CREATE by pressing [→], [↑] and ENTER in that order.

3. The cursor is on the STATION line. Enter station name, up to 20 characters.

4. Press the [↓] key to go to the ID CODE line. Enter station ID code. *(Currently ship station IDs have five digits and coast stations have four. In the future both will have nine.)*

5. Press the [↓] key to go to the MODE line. MODE appears in inverse video. Use the [→] key to select communication mode. Each time the key is pressed the communication mode changes in the sequence of ARQ, FEC, DIRC and CW.

   ARQ ..... automatic retransmission request
   FEC..... forward error correction
   DIRC ..... direct FSK (five unit code, no error correction)
   CW..... Morse code

6. Press the [↓] key to go to the CH/TABLE line. CHANNEL appears in inverse video. If you want to select the SCAN TABLE, press the [→] key.

7. Press the [↓] key to go to the NUM/TABLE line.

8. Enter channel number [ITU channel number or user channel number registered (See page 3-11)]. If you select the SCAN TABLE, press the space bar to display the scan group list and select a desired scan group. (When calling a station, the station call is first done about one minute on a TX frequency in the scan group. If there is no reply from the station, TX frequency is automatically changed to next one to call the station again. Thus, TX frequency is changed in order until connection is established.)

9. Press the **ENTER** key. The prompt OK/CANCEL asks for verification of data.

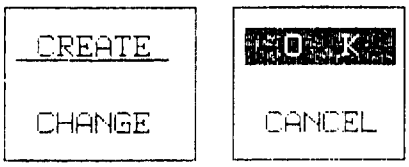


Fig. 3-7 OK/CANCEL Prompt

10. If the data are correct, press the **ENTER** key. (To cancel, place cursor on CANCEL by pressing the [↓] key, and then hit the **ENTER** key. *Data entered are erased.*) The station name has been registered and appears in the STATION LIST.

11. To enter other stations, select CREATE again by pressing the [→] key followed by the **ENTER** key. Repeat steps 3-10 for each station. Each newly entered station appears in the STATION LIST.

12. To confirm the data registered, pressing the [↓] key, view the station name and its particulars in the STATION SET UP.

NOTE: If you enter a station which exists the indication STATION BY THAT NAME ALREADY EXISTS appears. To view the contents of the station list, press any key once to go to the previous screen. Then, check the data for correctness. To change the data of an existing station;

Changing the Contents of a Station

1. Press the [↓] key to place the cursor on a station (name) you want to change the contents in the STATION LIST.
2. Press the [→] key to select CHANGE (CHANGE appears in inverse video).
3. Press the **ENTER** key. The cursor appears on the STATION line in the STATION SET UP.
4. Use the [↑] and [↓] keys and the **BACKSPACE** to make corrections.
5. Press the **ENTER** key. The prompt OK/CANCEL asks for verification of data.
6. If the data are correct, press the **ENTER** key to terminate keyboard operation. The last-entered station appears on the top line of the STATION LIST and its particulars appear in the STATION SET UP window.

Timer Operation

The DP-5 can transmit or receive a file, turning itself off and on at a predetermined time. Up to 10 timer operations can be registered.

Procedure

1. Press function key **F5**. Select TIMER OPERATION ENTRY by the [2] key. The screen should look something like Fig. 3-8.

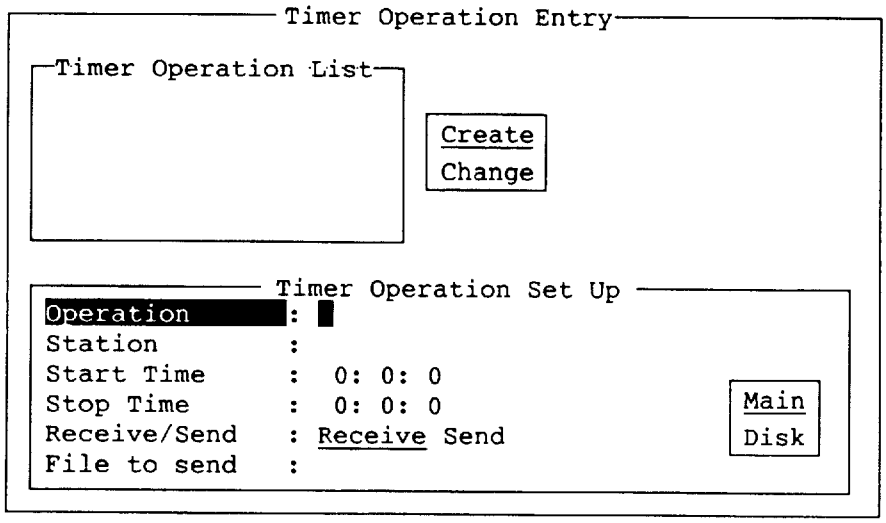


Fig. 3-8 Timer Operation Entry Screen

* At this time, if one or more timer-operation name has been registered, the "Change" is underlined. Press [→] and [↑] keys in that order, then the "Create" is underlined.

2. Enter a suitable operation name on the OPERATION line. All alphanumeric characters are valid. See note 2.

3. Place the cursor on the STATION line. Press the space bar, then the Station List (described at the previous section) appears. Select a desired station by pressing the [↓] key followed by the ENTER key. Then the station name selected is listed at the Timer Operation Set Up.

4. Press the [↓] key to advance the cursor to the START TIME line. Enter start time, the time the operation is to begin, using 24-hour notation. To have the set turn on at 8:35, for example, the keying sequence would be;

   8 → 3 5

5. Press the [↓] key to advance the cursor to the STOP TIME line. Enter stop time, the time the operation is to end.

6. Press the [↓] key to advance the cursor to the RECEIVE/SEND line. Select receive or send.

7. For send, designate the file to be sent. Press the [↓] key to advance the cursor to the FILE TO SEND line. To enter a file name, press the space bar to display the file list and select a desired file name followed by the ENTER key.

* Before selecting a desired file, if necessary, designate the location of the file. For floppy disk, press the [→] and [↓] keys followed by the **ENTER** key. (DISK is underlined.)

8. When all timer operation data are entered, press the **ENTER** key. The prompt OK/CANCEL asks for verification of data.

9. If the data is correct, press the **ENTER** key to terminate keyboard operation. The operation name appears in the TIMER OPERATION LIST. See note 2 and 3.

10. To enter another timer operation, press the [→] key to change the CREATE to inverse video, followed by the **ENTER** key. OPERATION of TIMER OPERATION SET UP appears in inverse video, indicating you may enter data. Repeat steps 2 to 9 for each timer operation parameter.

NOTE: 1) To alter a timer operation, select it on the TIMER OPERATION LIST, and then press the arrow keys followed by the **ENTER** *key (CHANGE is underlined and OPERATION appears in inverse video). Enter new data.*

2) If the same operation name which is already registered is entered, the following alarm indication appears.
OPERATION NAME ALREADY EXISTS.
PRESS ANY KEY TO ESCAPE.
At this time, press any key and change the operation name.

3) If the station name which is not registered at the STATION ENTRY is entered, the following alarm indication appears.
STATION BY THAT NAME DOES NOT EXIT.
PRESS ANY KEY TO ESCAPE.
At this time, press any key and re-enter the station name correctly.

Frequency Scanning

The DP-5 can automatically control radio equipment through frequency scanning. The radio equipment scans a number of frequencies (according to your selection), stopping when your own ID code is detected in an incoming signal. The transmitter is tuned to the corresponding transmitter frequency, the communication link is established and the traffic is automatically exchanged. Scanning resumes once the link is disconnected.

You may store a maximum of 10 groups/20 channels per group. *Remember that frequency scanning is possible only in the ARQ and FEC modes.*

Procedure

1. Press function key **F5**. Select SCAN ENTRY by pressing the [3] key. The SCAN ENTRY screen appears.

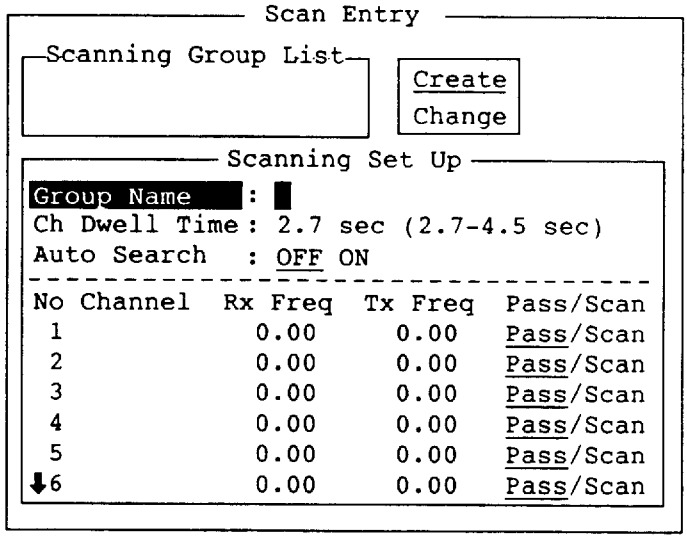


Fig. 3-9 Scan Entry Screen

* At this time, if one or more scanning group has been registered, the "change" is underlined. Press [→], [↑] and ENTER keys in that order to register a new scanning group.

2. The cursor is on the GROUP NAME line, where you may enter group name.

3. Press the [↓] key to advance the cursor to the CH DWELL TIME line. Enter channel dwell time in seconds. The dwell time is the time the receiver waits on each channel before it selects the next frequency.

4. Press the [↓] key to advance the cursor to AUTO SEARCH. To have your radio equipment stop scanning when it finds the strongest signal (highest S/N ratio), select AUTO SEARCH ON. And to have it stop scanning on the first signal it finds, turn the AUTO SEARCH OFF. The [→] and [←] keys turn AUTO SEARCH on and off.

5. Advance the cursor to line no. 1 in the SCANNING SET UP window. Enter channel number (ITU or user channels).

6. Press the [↓] key to advance the cursor to line No. 2. Enter channel number. Repeat this procedure to enter other channel numbers.

7. After entering all channels required, press the **ENTER** key.

8. The unit asks for verification of data. If the data are correct, press the **ENTER** key to save the data. The scan group name entered appears in the SCANNING GROUP LIST.

9. To enter another scan group, press the [→] key followed by the **ENTER** key. Repeat steps 2-8 for each scan group.

NOTE: When the scan group memory is full the DP-5 displays SCAN GROUP INFORMATION FULL.

Editing, Adding, Deleting, Disabling Scan Channels

General Procedure

1. Place the cursor on a group name in the SCANNING GROUP LIST. The particulars of that scan group appear in the SCANNING SET UP window.

2. Press the [→] key to change CHANGE to inverse video, followed by the **ENTER** key.

3. Position the cursor on the line (channel) to be changed.

4. Do one of the below operations, and then press the **ENTER** key. A prompt asks you to verify changes. If correct, press the **ENTER** key to terminate keyboard operation.

Editing

To edit channel number, hit the **BACKSPACE** key to delete the channel number. Then, enter channel number.

Adding

To add a channel number enter it on a vacant line.

Deleting

To delete a channel number hit the **BACKSPACE** key until it disappears.

Disabling

To temporarily delete a channel from scanning, press the [←] key to underline PASS.

Scramble Operation

The DP-5 can exchange enciphered information with another receiving station. Up to five scramble groups can be entered.

Procedure

1. Press function key **F5** followed by the [4] key to display SCRAMBLE CODE ENTRY screen.

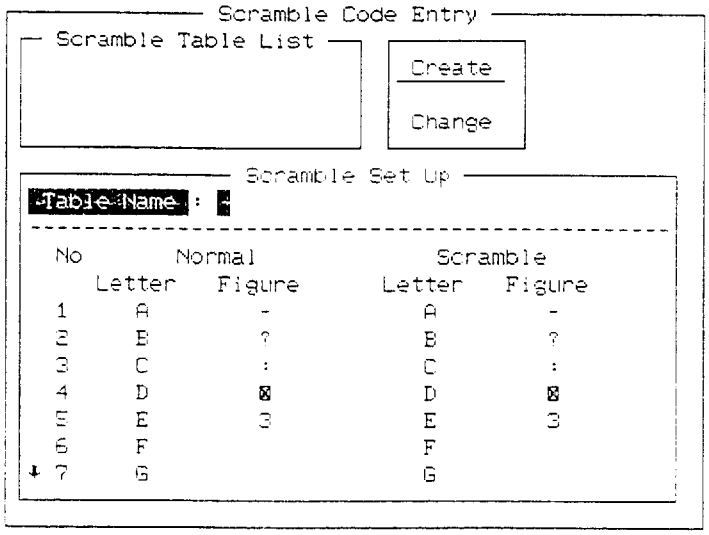


Fig. 3-10 Scramble Code Entry Screen

* At this time, one or more Scramble Table has been registered, the "Change" is underlined. Press the [→], [↑] and ENTER key in that order to register a new scramble table.

2. Enter group name on the GROUP NAME line.

3. Press the [↓] key to advance the cursor to "No. 1."

4. Using the [→] and [←] keys, select a scramble code combination.

5. Repeat steps 3 and 4 to select a scramble code for each letter of the alphabet.

6. Press the **ENTER** key. You are asked to verify data.

7. If the data are correct, press the **ENTER** key again. The GROUP NAME corresponding to the scramble code entered appears in the SCRAMBLE GROUP LIST.

8. To enter another scramble group, press the [→] key followed by the **ENTER** key. Repeat steps 2-7 for each group.

User Channel

The user channel list provides storage for up to 100 user channels, numbered 0-99. Note that user channels may be used in frequency scanning.

Procedure

1. Press function key **F5** and then the [5] key. The USER CHANNEL ENTRY screen appears.

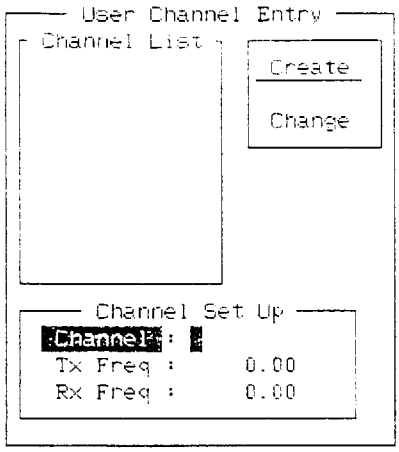


Fig. 3-11 User Channel Entry Screen

* At this time, one or more User Channel has been registered, the "Change" is underlined. Press the [→], [↑] and ENTER key in that order to register a new User Channel.

2. Enter channel number on the CHANNEL line.

3. Advance the cursor to the TX FREQ line. Enter TX frequency.

4. Advance the cursor to the RX FREQ line. Enter RX frequency.

5. Press the **ENTER** key. A prompt asks for verification of data.

6. If correct, press the **ENTER** key. Channel number entered appears in the CHANNEL LIST.

7. To enter another user channel, press the [→] key followed by the **ENTER** key. Repeat steps 2 thru 6.

8. To alter user channels, place the cursor on the channel to be altered (in the CHANNEL LIST). Select CHANGE by pressing the [→] key and the **ENTER** key. Then, make changes. Press the **ENTER** key twice to terminate keyboard operation.

Text Editor Parameters

The TEXT EDITOR screen is where you will compose and edit file messages. This screen can be formatted according to your needs with the EDITOR menu.

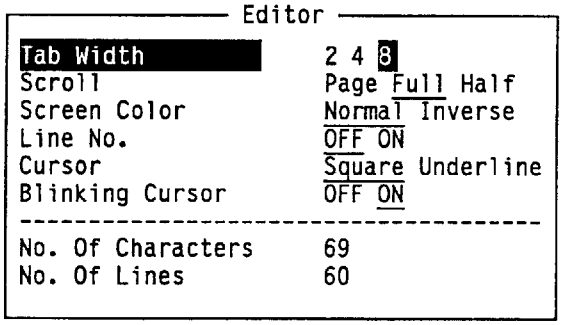


Fig. 3-12 Editor Screen Parameters

Procedure

Press function key **F7** to display the EDITOR screen. Use the cursor keys to select the settings you require. After completion, press the **ENTER** key to terminate keyboard operation.

Menu Description

Tab Width — Sets the quantity of character spaces between horizontal tabs.

Scroll — Sets how much the screen moves up over the page, when the **PAGE UP** or **PAGE DOWN** keys are operated, in increments of page, full screen and half screen.

Screen Color — Selects screen color; normal, white characters on black background, or reverse, black characters on white background.

Line No. — Turns the line number display on and off.

Cursor — Selects cursor style; square block or underline.

Blinking Cursor — Turning the blinking cursor item on causes the cursor to blink.

No. of Characters — Indicates the number of characters per line.

No. of Lines — Indicates the number of lines per page.

CREATING AND EDITING FILES

General

This chapter describes how to create new text files, update existing files, delete, move and edit text, search for a word in a file, replace every occurrence of a word or phrase with another word or phrase, and printing.

Creating a File

You will create files on the text editor screen, which provides a complete line of editing facilities.

Procedure

1. Press function key **F1** to display the FILE Menu. Fig. 4-1 shows the FILE menu.

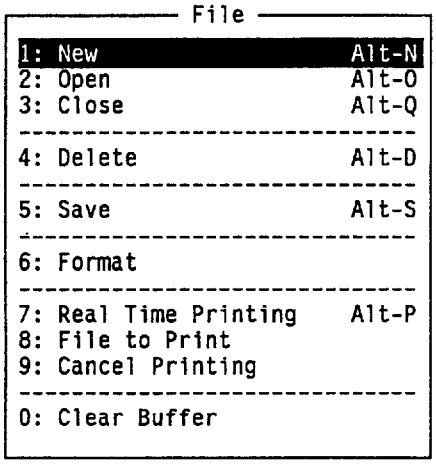


Fig. 4-1 File Menu

2. Press the **ENTER** key or the [1] key. The default screen for file making (UNTITLED 1 or UNTITLED 2) appears.

3. Type your message as you would with an ordinary typewriter or word processor.

*Note: Do not use small letters, #, &, *, $ and % for message text. Do not put "$$$" (three successive $'s) in the middle of a sending message, but at the end. The communication line is automatically disconnected when the DP-5 detects this string.*

USEFUL KEYS	
BACKSPACE	Deletes the character to the left of the cursor.
ENTER	Advances the cursor to the next line.
CURSOR ([←], [↑], [→], [↓])	These keys control the cursor.
DELETE	Deletes the character to the right of the cursor.

Saving a File

You can save a file to the main memory or a floppy disk. The main memory is useful for automatic storage of incoming files and holding files which will be sent through automatic operation; but its storage capacity is limited (100,000 characters). The floppy disk, however, can store 720,000 characters.

To save a file to a floppy disk the disk must be formatted. Formatting prepares the disk so information can be written onto its surface. You have to format a disk only once. You can reformat a disk you have used before, however, in which case all prior information on the disk is erased.

Formatting a Floppy Disk

Procedure

1. Press function key **F1** to display the FILE menu.

2. Press the [6] key. The message PLACE FD FOR FORMATTING. PRESS ENTER KEY TO START appears on the CRT. Insert a floppy disk to be formatted.

3. Press the **ENTER** key.

4. The prompt YES/NO asks you if you want to format the disk. Press the **ENTER** key to begin formatting, or press the [↓] key to escape.

5. When formatting is completed, FORMATTING COMPLETED appears on the CRT.

6. To format another disk, remove the just formatted disk. Insert a new disk and press the **ENTER** key.

Saving and Closing a File

You can save a file two ways: Save it without losing your place on the screen (called "save"), or save it before clearing the screen or exiting (called "close").

Saving

1. Press function key **F1** to display the FILE menu.

2. Press the [5] key. The screen should look something like Fig. 4-2.

* Instead of the procedures of 1 and 2 above, press the [S] key holding down the ALT key, then Save Screen as shown below appears.

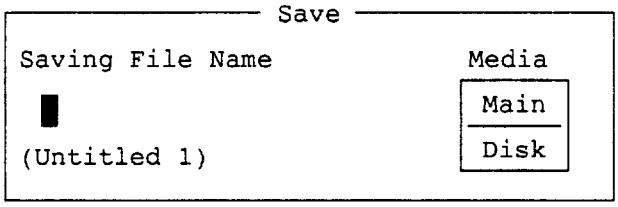


Fig. 4-2 Save Screen

3. To store to the main memory enter a file name, up to eight characters.

   You may use any letters or numbers on the keyboard. But you may not use the following punctuation symbols;

   | . : " > < ;

   To store to a floppy disk, press [→], [↓] and **ENTER** keys in that order to underline DISK. Enter the file name.

   (Ex) FURUNO-1.TXT
   (It is better to enter extension name to distinguish text file from macro file.)
   (Max. 8 characters)

4. Press the **ENTER** key. The message is saved to the memory or floppy disk without clearing the screen.

Closing

1. Press function key **F1** to display the FILE menu.

2. Press the [3] key. The prompt FILE CLOSED, SAVE? appears on the screen.

3. To save the file, press the **ENTER** key. (If you do not need to save file, press [↓] followed by the **ENTER** key.)

4. The remaining steps are the same as that for Save (on the previous page).

NOTE: Instead of the procedures of 1 and 2 above, press the [Q] key holding down the [ALT] key then the prompt FILE CLOSED, SAVE? appears.

Opening and Closing a File

The main memory of this unit provides two working areas (called working area 1 and working area 2) to which you can load a file; but only one file may be displayed on the CRT.

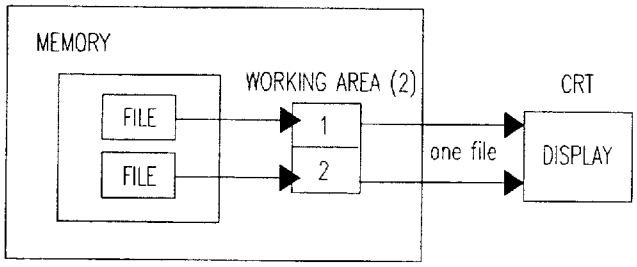


Fig. 4-3 Configuration of Main Memory

Opening

Procedure

1. Press function key **F1** to display the FILE menu.

2. Press the [2] key. A chronological list of the files stored in the main memory appears.

3.If you want to sort the files by name, press [→] twice, [↑], and the **ENTER** key in that order.

4. To view the contents of a floppy disk, press [→], [↓], and the **ENTER** key in that order. If you want to sort the files by name, press [→] twice, [↑], and the **ENTER** key in that order.

5. Select a file by using the [↑] and [↓] keys. Press the **ENTER** key.

6. If the file has a password, enter the password and then press the **ENTER** key.

7. The contents of the file appear and the title bar shows the file name. You may repeat this procedure to load another file into a working area.

NOTE 1: When the working area is full, the message FILE CAN'T OPEN appears. Then, you would close a file to clear a working area.

NOTE 2: Instead of the procedures of 1 and 2 above, press the [O] key holding down the [ALT] key.

Closing

Procedure

1. Press function key **F4** to display the WINDOW menu. The first and second lines show the names of the files loaded in working areas 1 and 2.

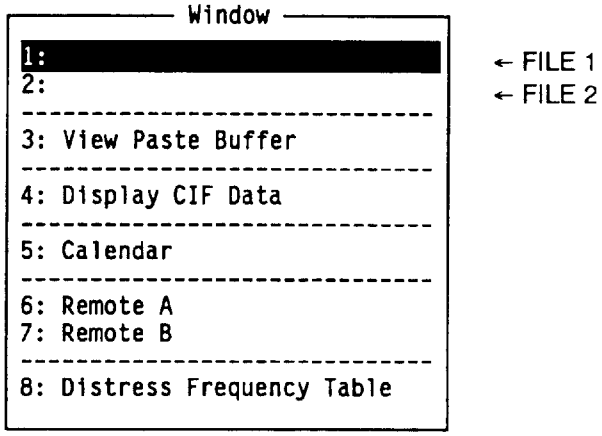


Fig. 4-4 Window Menu

2. Press function key **F1** to display the FILE menu.

3. Press the [3] key to display the file name of the working areas 1 and 2.

4. Select a file to be closed by using the [↓] or [↑] key. Press the ENTER key. The prompt SAVE FILE? YES or NO appears on the screen.

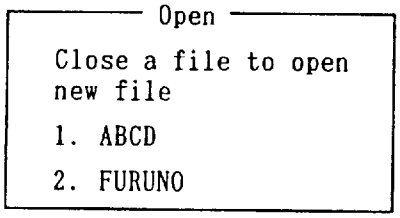
5. To save the file, press the **ENTER** key. If you don't need to save the file, press the [↓] key followed by the **ENTER** key.

6. To save the file, enter a file name and then press the ENTER key.

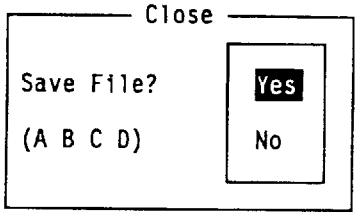
7. The first or second line of the WINDOW menu will now be blank, meaning the file has been removed from a working area.

Opening a file when working area full

When the working areas 1 and 2 are loaded, if you press the [F1] key followed by the ENTER key to open a new file, the following appears to indicate that a loaded file in the working areas should be closed.



Select a file to be closed by using the [↓] or [↑] keys followed by the ENTER key.



To save the file, press the ENTER key. If you don't need to save the file, press the [↓] key followed by the ENTER key.

Saving a File Under a New Name

You may want to use a portion of an existing file in a new file, and save the file under a new name.

Procedure

1. Call up a file.

2. Edit the file.

3. Press function key **F1**.

4. Then, press the [3] key (to clear the screen) or [5] key (to keep your place on the screen).

5. The prompt FILE ALREADY EXIST, OK TO OVERWRITE appears on the screen. To save the file under its original name, press the **ENTER** key.

6. To store the file under a new name, select NO. Press the **BACKSPACE** key to erase the original name and then enter a new name.

7. Press the **ENTER** key.

8. If you want to confirm that the file was saved under a new name, press **F1** and [2] in that order to view the OPEN screen.

Printing a File

You can print out a file stored in the memory or a floppy disk or the contents of the paste buffer.

Procedure

1. Press function key **F1**.

2. Press the [8] key. The display should look something like Fig. 4-5.

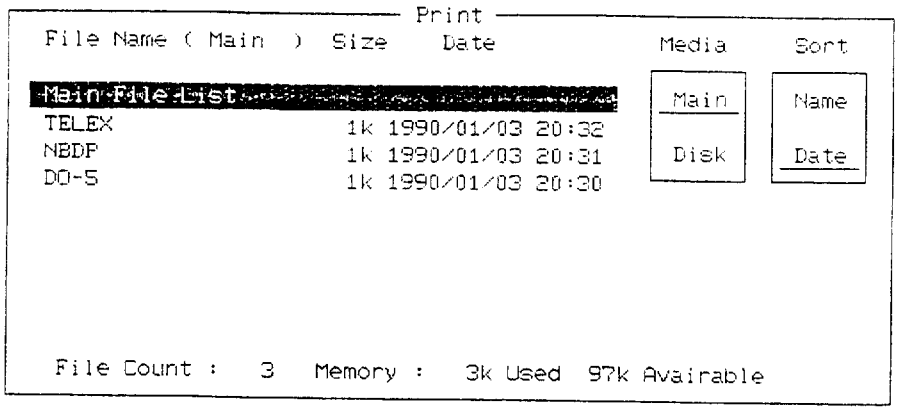


Fig. 4-5 Print Screen

3. If necessary, select a media (main memory or floppy disk) by arrow keys, and then press the **ENTER** key.

4. To print, select a file list or file. Press the **ENTER** key.

Real Time Printing

An incoming or outgoing message can be printed out while it is being received or transmitted. This is called real time printing.

Procedure

1. Press function key **F1** to display the FILE menu.

2. Press the [7] key to turn real time printing on. PRINT appears on the screen. Then, when receiving or transmitting a message, at the same time it is printed.

3. To turn real time printing off, do steps 1 and 2. The PRINT disappears on the screen.

NOTE: Instead of the procedures of 1, 2 and 3 above, press the [P] key holding down the ALT key. The real time printing alternating changes ON and OFF.

Deleting a File

Procedure

1. Press function key **F1**.

2. Press the [4] key. The screen should look something like the one in Fig. 4-6.

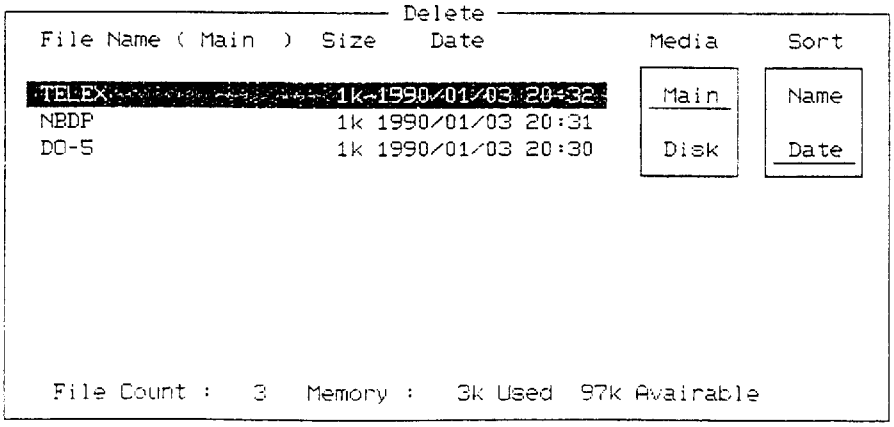


Fig.4-6 Delete Screen

3. Select a file by pressing the [↓] or [↑] key. Then, press the **ENTER** key. The prompt FILE DELETE OK? asks you if you want to delete the file.

4. To delete the file, press the **ENTER** key. (To cancel, press the [↓] key followed by the **ENTER** key.)

NOTE: Instead of the procedures of 1 and 2 above, press the [D] key holding down the ALT key.

Text Editing

You can delete, move and copy text by using the CUT, COPY and PASTE functions in the EDIT menu (function key **F2**). Note that this key functions only when a file is displayed.

Cursor Placement

The EDIT menu provides commands which let you place the cursor at the top, bottom, or desired line of the current file.

COMMAND	MEANING
Goto Top	Places the cursor at the top line of the current file. (Same as the HOME key.)
Goto Bottom	Places the cursor on the last line of the current file. (Same as the END key.)
Goto Line	Places the cursor on the line desired. (Same as the ALT + L keys.)

Cutting and Pasting

Procedure

1. Place the cursor on the first character of the text to be cut.

2. Highlight the text to be cut by pressing and holding the **SHIFT** key while pressing the [→] key. If you highlight text which you do not want to cut, press the [←] key to adjust the highlight.

3. Press the **F2** and [2] keys in that order (Instead of this method, the DELETE key is operative.)

4. The highlighted text is cut and the remaining text is reformatted. If a mistake is made, you can restore the text by immediately selecting UNDO in the EDIT menu.

To move text to a new location after it has been cut, place the cursor at the exact spot in the message where the cut text is to start. When the text cursor is placed correctly, press the [4] key in the EDIT menu (Instead of this method, the INSERT key is operative).

Copying and Pasting

Procedure

1. Select the text to be copied (see step two of the previous procedure).

2. Press function key **F2** and then press the [3] key. (Instead of this method, it is operative to press the [C] key holding down the ALT key.)

3. Place the cursor at the exact spot on the message where the copied text is to start.

4. Press function key **F2** and then [4] key.

Undo

If you are editing a file and you want it to look like it did when you started use the UNDO feature to return the file to its most recent state. For example, you have cut text but want to restore it. Then, you would select UNDO in EDIT menu to restore the text to its most recent location. (Pressing the [X] key holding down the ALT key executes the same function of the UNDO.)

Select All

At times you may want to select an entire file automatically. The SELECT ALL feature lets you select an entire file without having to select it by highlighting it manually. This feature can be useful when you want to combine files. The procedure below explains how to tack the file loaded in working area 1 onto the end of the file loaded in working area 2.

Procedure

1. Load a file in working area 1 by pressing function key **F4** followed by the **ENTER** key. The file in working area appears.

2. Press function key **F2** and then [5] key. (Instead of this method, the ALT key + [A] keys are operative.)

3. The entire file appears in inverse video.

4. Press the [C] key holding down the ALT key. The file is placed in the paste buffer memory.

5. Press function key **F4**. To select the file loaded in working area 2, press the [2] key. The file in the working area 2 appears on the display screen.

6. Place the cursor at the exact spot in the message where the text now in the paste buffer memory is to start.

7. Press the INSERT key. The pasted text begins where the cursor is placed.

Finding Text

The find feature lets you search for text in a forward or reverse direction.

Procedure

1. Press function key **F2** and then the [6] key. The SEARCH screen appears. (Instead of this method, the ALT + [F] keys are operative.)

Fig. 4-7 Search Screen

2. Type the word or code you want to find. Select FORWARD or REVERSE to search the file in a forward or reverse direction respectively from the cursor position. Press the **ENTER** key to begin the search.

3. When the unit finds the word, the cursor stops at the first character of the word.

4. Press the **ENTER** key to continue the search.

Replacing Text

The replace feature helps you replace every occurrence of a word or phrase with another word or phrase in a file.

Procedure

1. Press function key **F2** and then the [7] key. (Instead of this method, it is operative to press the [R] key holding down the ALT key.)

2. The REPLACE screen appears.

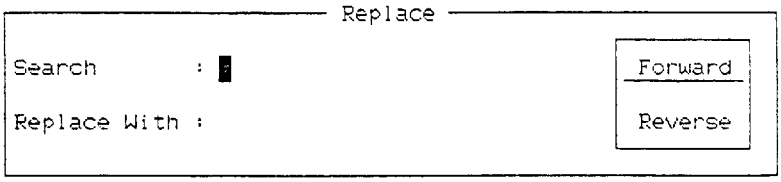


Fig. 4-8 Replace Screen

3. Type the word you want to replace (SEARCH).

4. Hit the [↓] key. Type the new word (REPLACE WITH). Select FORWARD or REVERSE to search the file in a forward or reverse direction respectively from the cursor position. Press the **ENTER** key to execute the replacement. The unit searches for the "SEARCH" word forward or reverse from the cursor position and replaces it with the "REPLACE WITH" word.

Communication Record (Logging)

Transmission/Reception date, time, ID, mode, TX/RX frequencies and station name are recorded each communication and stored in the main memory. See the Fig. below.

To see these data;

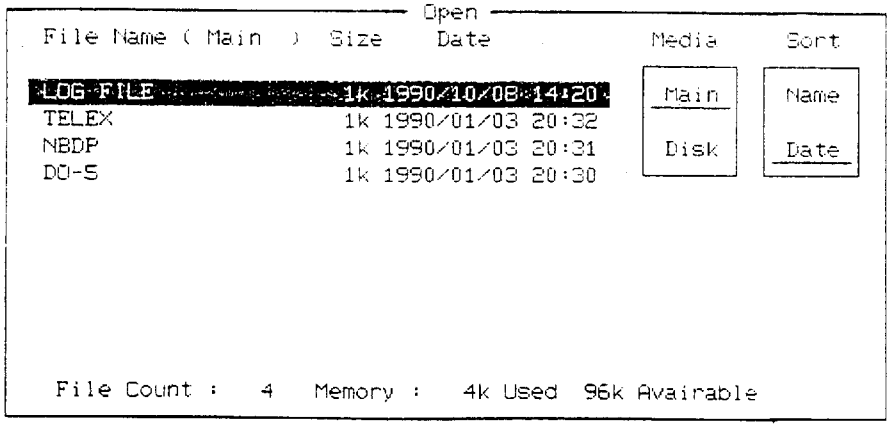
1. Press function key **F1** and then the [2] key. (Or press the [O] key holding down the ALT key.)

2. A list of the files stored in the main memory appears.

3. Select LOG FILE by pressing the [↓] key and then press the **ENTER** key. The communication record appears.

Note: You can print out the communication record by selecting LOG FILE on the print screen.

Note: The LOG FILE can store about 230 communication records. When the FILE is full, an error message appears to alert you. If this occurs, delete all communication records. (Before deleting the records, print them out or store with another file name if required.)



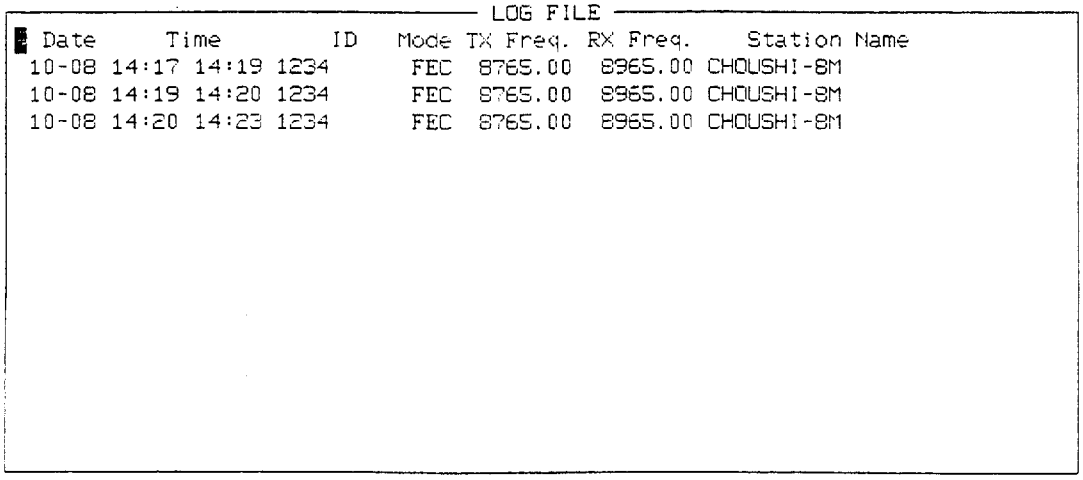


Fig. 4-9 Log File

Printing Communication Buffer

When Tx/Rx MSG Save is set to OFF (see page 10-5), all messages received are entered to the communnication buffer.

To print out a contents of the communication buffer;

1. Press the PAGE UP or PAGE DOWN key to display the contents of the communication buffer.

2. Locate the cursor to the position where you want to initiate print out.

3. Press the arrow key while holding down the SHIFT key so taht the part you want to print out appears in inverse video.

4. Press the [C] key, holding down the ALT key to execute "COPY".
   The text pointed out in above procedure is entered to the paste buffer.

5. Press the [F4] key and [3] key so that the content of the paste buffer appears.

6. Press the ENTER key so that the designated part of the communication buffer is printed out.

TRANSMITTING AND RECEIVING

General

This section shows you how to transmit and receive in the standard radiotelex modes ARQ and FEC, radiotelegraphy CW and direct frequency shift keying DIRC. Also included are the procedures for frequency scanning, scramble operation, and automatic operation.

Manual Calling

The simplest way to communicate with a desired party is described here. It is called "Manual Calling."

When ACTIVE FILE AUTO SEND is ON (refer to page 10-6), a message edited on the screen will be transmitted as followed;

Procedure

1. Edit a message.

2. Press function key [F3] to display the OPERATE menu.

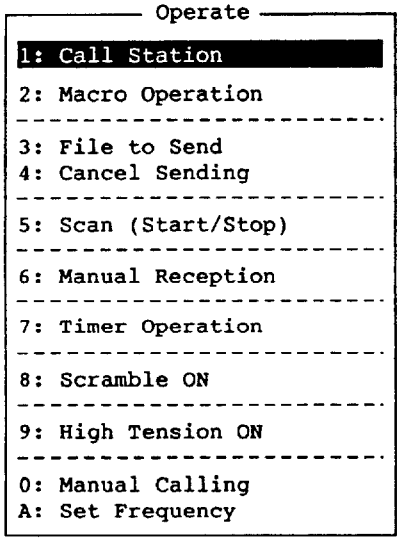


Fig. 5-1 Operate Menu

3. Press the [A] key. The following appears.

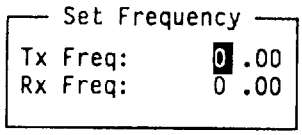


Fig. 5-2 Set Frequency Screen

4. Input a pair of communication frequency. This can be made only for Furuno transceiver connected.

5. Press the ENTER key.

* For other maker's transceiver connected, set a pair of frequency at the transceiver, instead of the above procedure 2, 3 and 4.

6. Press the function key [F3] again and then the [0] key. The following appears.

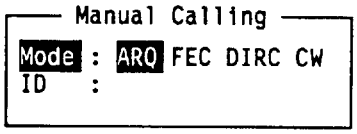


Fig. 5-3 Manual Calling Screen

7. Select the communication mode. The ARQ appears in inverse video. If the other mode is required, press the [→] key, so that a desired mode appears in inverse video.

8. Press the [↓] key and input a ID number of party.

9. Press the ENTER key. Then the line will be connected a short while.

10. When a message edited is displayed on the screen, it is transmitted immediately (after automatically exchanging the WRU and HR code for the ARQ mode).

    In the FEC mode, press the ENTER key, then the edited message is transmitted.

11. When a message is not edited, you can directly type a message after manually exchanging the WRU ([F9]) and HR ([F10]) code for the ARQ mode).

12. To disconnect the communication line, press the [F12] key.

Calling a Station

Procedure

1. Press function key **F3** to display the OPERATE menu.

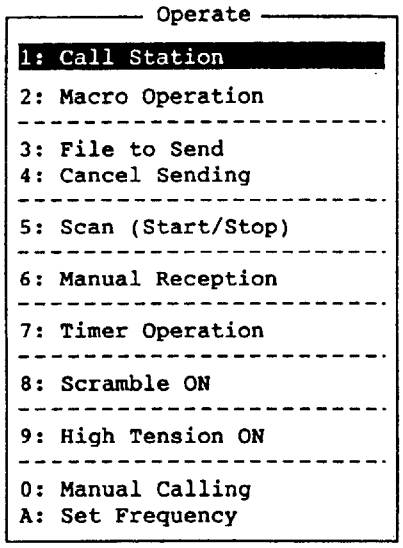


Fig. 5-4 Operate Menu

2. Press the [1] or **ENTER** key. The STATION LIST appears on the CRT.

3. Select the station you wish to call by pressing the [↓] key.

4. Press the **ENTER** key to establish connection with the station.

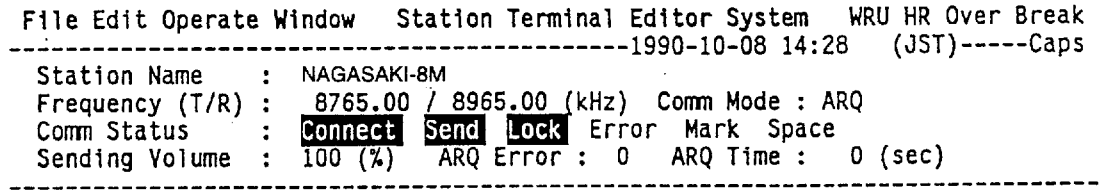


Fig. 5-5 Communication Status Display

CONNECT appears in inverse video on the COMM STATUS line when an acknowledge signal from the station called is detected. *(In the ARQ mode connection may be delayed due to signal condition. In the FEC mode, however, inverted display of CONNECT appears several second later since the acknowledge signal is not required.)*

5. When ACTIVE FILE AUTO SEND is set to ON (refer to page 10-6), the message dislayed on the screen is transmitted immediately. If it is set to OFF, follow the next section.

Transmitting a File Message from the Memory or a Floppy Disk

You may send a message file that you have stored in the main memory or a floppy disk. Execute the below procedure after calling a station.

Procedure

1. Connecting the line, press function key **F3** and then [3] key.

2. The SEND screen appears.

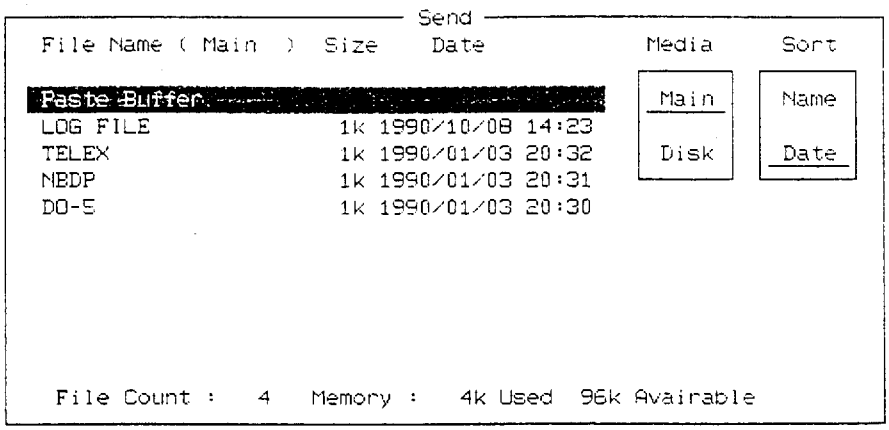


Fig. 5-6 Send Screen

3. Select the file you wish to send by using the [↓] key. Then, press the **ENTER** key to transmit the file.

Stopping a Message During Transmission

Procedure

1. Press function key **F3** and then the [4] key.

2. SEND CANCELED appears on the screen. The sending message stops but the line is still connected.

Selecting Reception Mode

Procedure

1. Press function key **F3** and then the [6] key.

2. Using the left and right arrow keys, select reception mode.

AUTO ..... Automatic operation in radiotelex modes ARQ and FEC
ARQ ..... International radiotelex ARQ mode
FEC..... International radiotelex FEC mode
DIRC ..... Direct FSK

3. Press the ENTER key. The reception mode appears on the screen.

All messages received are entered to the communication buffer. When REAL TIME PRINTING is ON (refer to page 2-8), messages received are printed out on real time. If it is set to OFF, these are referred on the communication buffer. The PAGE UP and PAGE DOWN key are used to view the contents of the buffer.

When Tx/Rx MSG SAVE is set to MAIN or DISK, messages received are stored in the main memory or floppy disk. These are recalled at OPEN screen, attaching a file name as LOG01, LOG02... .

ARQ Operation

In ARQ operation one station (information sending station) sends data to another in block by block, then listens the acknowledge signal between blocks from the information receiving station which requests either the next block or retransmission of the last block if there is error. The request may be repeated up to 32 times, until the complete block is received free of error.

Procedure

1. Press function key **F3** and then press the **ENTER** key. The CALL STATION menu appears.

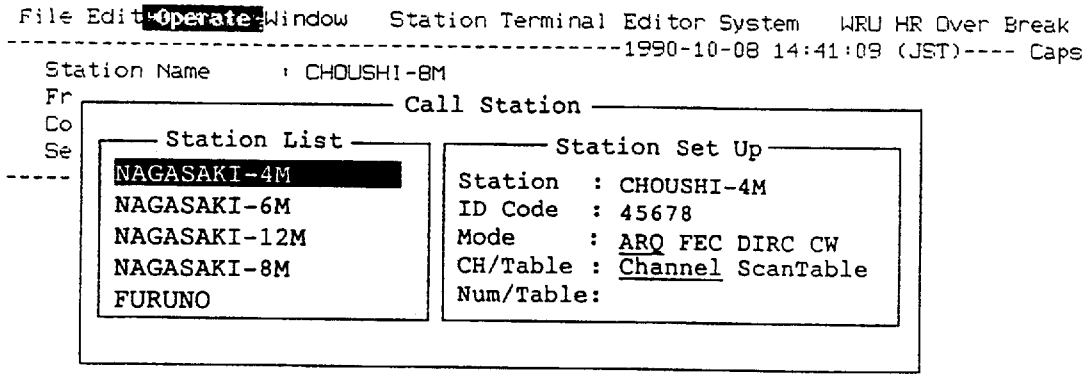


Fig. 5-7 Station Call Menu

2. Select a station which you wish to connect (must be registered for the ARQ mode). Then, press the **ENTER** key. The message CALLING STATION appears.

   If the following message appears, check the power of a radio connected and interconnections between the radio and the DP-5.

   Station calling suspended. Check radio and interconnections.
   Press any key to escape.

3. When an acknowledge signal is detected, CONNECT at the communication status display area lights in inverse video (see Fig. 5-9).

   If signal conditions are poor connection may take a while. If the connection does not succeed after elapsing one minute, the calling stops and CALLING FAILED is indicated. At this time, try the step 2 again one ninute later. Should signal conditions worsen during message transmission, ERROR appears in inverse video and 30 seconds later the line is disconnected.

4. When a message for transmission is displayed on the screen, the WRU code, HR code and the message just compiled is automatically sent immediately after calling and establishing a connection with the other station.

5. To send a message from a file, first press function key **F9** (WRU) to receive the answerback code of the other station. Verify that the code is correct from the station called.

6. Press function key **F10** (HR) to transmit your own identity (answerback).

7. You may now transmit a file stored in the main memory or a floppy disk. Press function key **F3** and then the [3] key to open SEND screen. Select a file to send and press **ENTER** key. SEND appears in inverse video while the file is being transmitted.

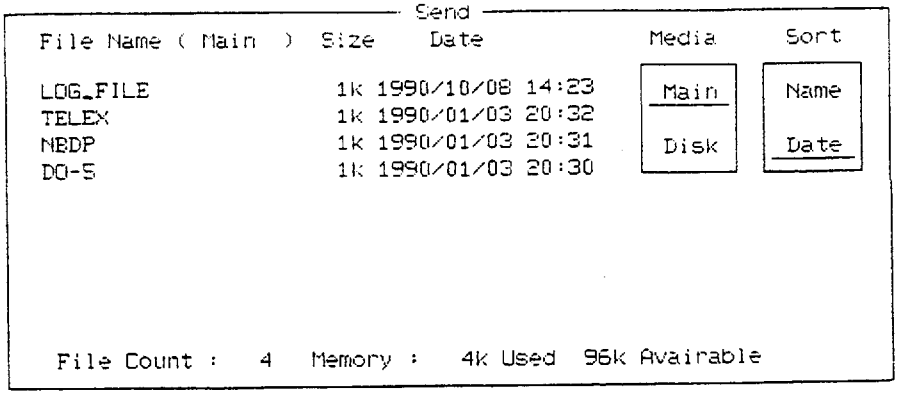


Fig. 5-8 Send Screen

Further, the SENDING VOLUME indication, showing percentage of message transmitted, counts upward as the message is being transmitted. ARQ error count and ARQ transmission time are also shown.

```
File Edit Operate Window  Station Terminal Editor System  WRU HR Over Break
-------------------------------------------1990-10-08 14:28  (JST)-----Caps
  Station Name     :  NAGASAKI-8M
  Frequency (T/R)  :   8765.00 / 8965.00 (kHz)  Comm Mode : ARQ
  Comm Status      :  Connect  Send  Lock  Error  Mark  Space
  Sending Volume   :  100 (%)   ARQ Error :  0   ARQ Time :   0 (sec)
-------------------------------------------------------------------------
```

Fig. 5-9 Communication Status Display

8. To change direction of traffic, press either function key **F11** (OVER), or [+] and [?]. Then, the other station becomes the information sending station, your station the information receiving station.

9. Receive a message from the sending station, if any.

10. After completion of communication, press the **F9** (WRU) key to receive the answerback code of the other station and then press the **F10** (HR) key to transmit your own answerback code.

11. Press function key **F12** (BREAK) to disconnect the line.

Communication example

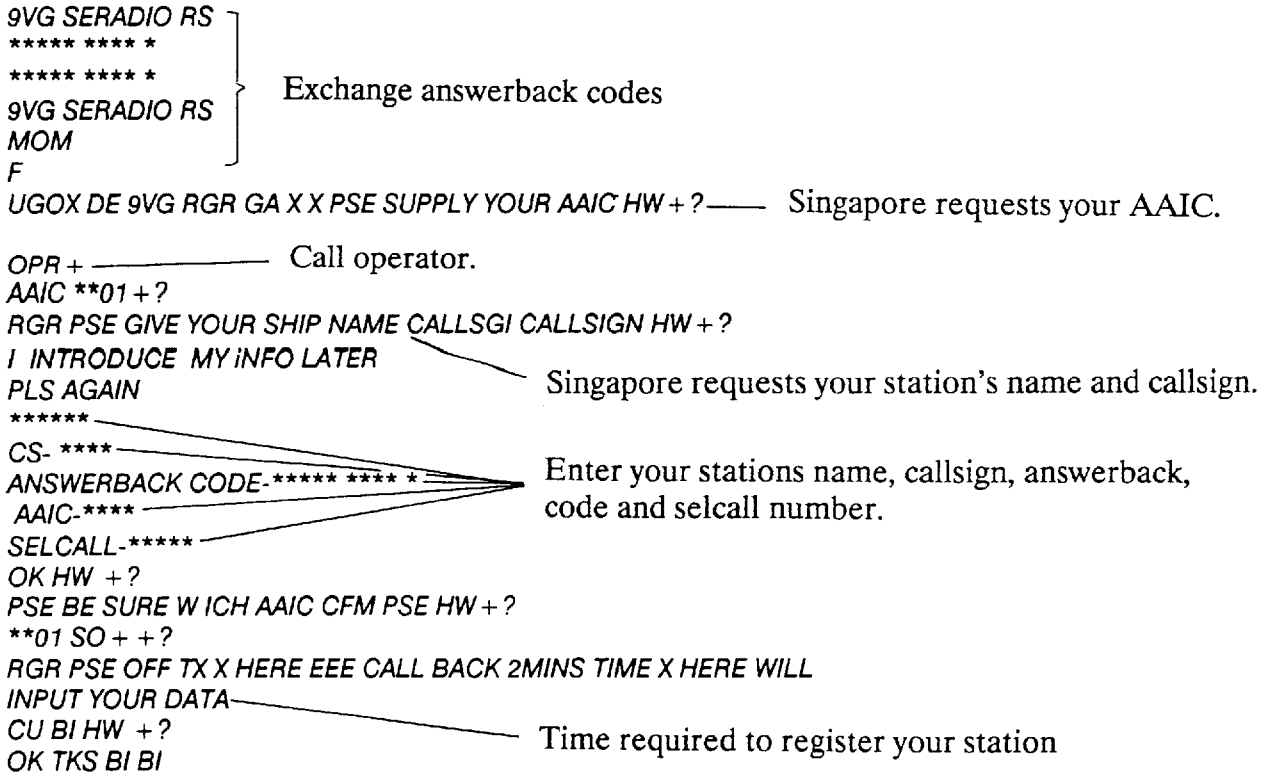
This section shows how to register your station with a coast station (Singapore), in order to connect with a land line and send messages to other stations.

Contact the coast station following the procedure on page 5-3. Then, register your station's name, call sign, answerback code and selcall number and AAIC with the coast station.

You can call the Singapore coast station on ITU channels 809, 821 or 1201 (other channels may also be used). Use communication mode ARQ. The Singapore coast station ID no. is 4620.

Registration procedure

1. Call Singapore coast station following the procedure on page 5-3.
2. Singapore requests your AAIC.
3. Type your AAIC.
4. Singapore asks for your callsign. Send your station's name, callsign, answerback code and selcall number.
5. Singapore sends time required to register your station.
6. Transmit end code.



Transmitting message directly (DIRTLX)

The procedure which follows shows how to transmit a Telex message directly to a station.

1. Execute "Calling a Station" on page 5-3.
2. After GA + and DIRTLX appear on your display, type Receiving station's Telex number.
3. Singapore coast station sends its Telex number. Type receiving station's answerback code.
4. Type MSG + ?
5. Type your message.
6. Type WRU. Receiving station and your station mutually exchange answerback codes automatically.
7. Type KKKK (end code) at end of message. Your answerback code, receiving station's Telex number and communication time appear on your display.
8. Receiving station sends GA + ?.

To send another message by DIRTLX, start at step 2. To finish, type BRK +

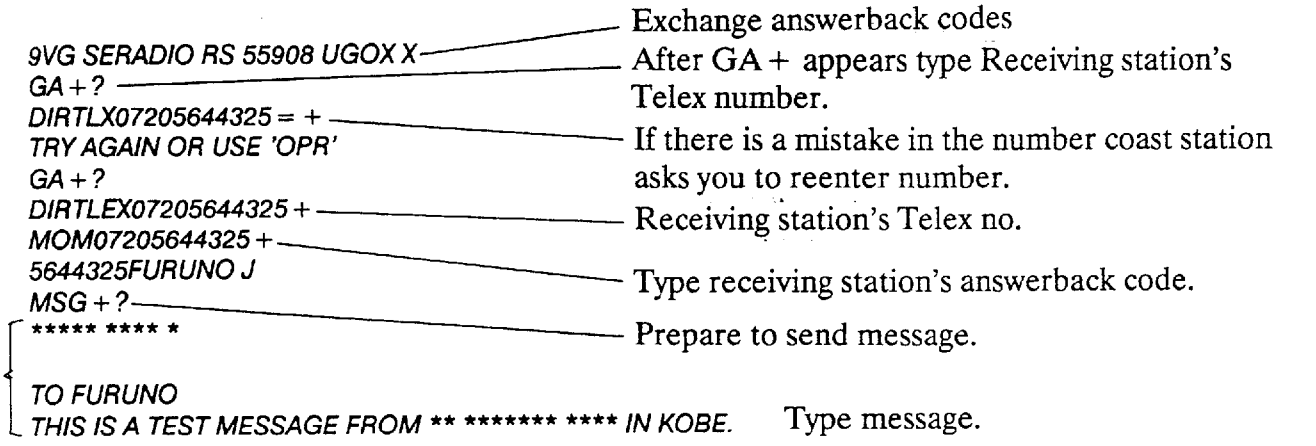


Table of Abbreviations

Abbreviation	Question	Answer or Advice
QRA	What is the name of your station?	The name of my station is ····.
QRC	By what private enterprise are the accounts for charges for your station settled?	The accounts for my station are settled by the private enterprise ····.
QRU	Have you anything for me?	I have nothing for you.
QRV	Are you ready?	I am ready.
QRX	When will you call me again?	I will call you again at ···· hours [on ···· kHz].
QSJ	What is the charge to be collected to ccincluding your internal charge?	The charge to be collected to ···· including my internal charge is ···· francs.
QSL	Can you acknowledge receipt?	I can acknowledge receipt.
QSX	Will you listen to ···· [call sign] on ···· kHz?	I am listening to ···· [call sign] on ···· kHz.
QTC	How many messages have you to send?	I have ···· message for you.
QTU	What are the hours your station is open?	My station is open from ···· to ···· hours.
Abbreviation	Definition	
BK	Signal used to interrupt a transmission progress.	
CFM	Confirm	
DE	"From ····"	
K	Invitation to transmit.	
NIL	I have nothing to send to you.	
NW	Now	
PSE	Please	
R	Received	
REF	Reference to ····.	
SVC	Prefix indicating a service telegram.	

Command and Abbreviation

Command	Function
TGM +	To indicate that the following message is a radiotelegram.
MSG +	To indicate that the ship station needs to be connected immediately any message held.
OPR +	Call operator.
URG +	Safety, urgency and distress message.
MED +	Request medical advice.
TEST +	Request coast station to send a test message for checking the ship station
BRK +	To clear the connection with the coast station.
Abbreviation	
GA +	I am ready. Transmit your command.
MOM	Wait a moment.
MSG +	Request pending messages from the shore.
KKKK	Terminate a message.

FEC Operation

The FEC method of error correction is used when there is more than one receiving station, and no replies are required by the other station. Each message is sent twice, the characters of the first message interleaved with those of the second. The receiving station thus has two chances to receive each character correctly. If both characters are in error, an asterisk (*) is printed.

Procedure

1. Press function key **F3**.

2. Press the **ENTER** key to display the CALL STATION menu.

3. Select a station which is registered for the FEC mode. Then, press the **ENTER** key. CONNECT lights in inverse video.

4. When an editing message is displayed on the screen, it is transmitted by pressing the **ENTER** key.

5. To transmit a file message stored in the main memory or a floppy disk, press function key **F3**, and then [3] key to open SEND screen. Select a file to send and press the **ENTER** key to transmit the message. SEND appears in inverse video while the message is being transmitted.

6. After the message is transmitted, press function key **F12** (BREAK) to disconnect the line.

Other Modes of Operation

CW

Morse converter automatically transmits Morse signals translated from stored messages in the memory or floppy disk; a morse key is not required to transmit messages in morse code.

DIRC

This mode is for reception and transmission using direct Frequency Shift Keying (direct FSK; five error code with no error correction).

Procedure

1. Press **F3** key to display OPERATE menu.

2. Press [6] to display MANUAL RECEPTION screen.

3. Press [→] to select DIRC.

4. Press **ENTER** key.

5. Press **F3** key to display OPERATE menu.

6. Press [9] to set HIGH TENSION on.
   HT appears on the screen.

7. Press **F3** to display OPERATE menu.

8. Press [1] to display the CALL STATION menu.

9. Select the station registered which is CW or DIRC mode.

10. Press **ENTER** key.

11. When an editing message is displayed on the screen, it is transmitted by pressing the **ENTER** key.

12. To transmit a file message stored in the main memory or a floppy disk, press function key **F3**, and then [3] key to open SEND screen. Select a file to send and press the **ENTER** key to transmit the message. SEND appears in inverse video while the message is being transmitted.

13. After the message is transmitted, press function key **F12** (BREAK) to disconnect the line.

Timer Operation

The DP-5 can automatically send or receive telex messages when the predetermined time comes (See page 3-6).

Procedure

1. Press function key **F3** to display the OPERATE menu.

2. Press the [7] key. The TIMER OPERATION LIST appears.

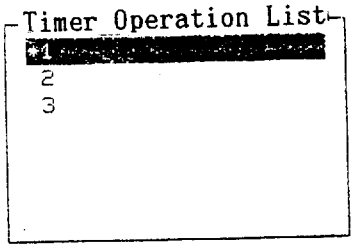


Fig. 5-10 Auto Operation List

3. Select the operation (name) you wish to execute. Press the **ENTER** key. An asterisk appears beside the operation selected. At the same time, the T.OP appears in inverse video at the communication status display area (see fig. 5-14). *If a floppy disk-stored file is to be sent, be sure the floppy disk containing the file is inserted in the floppy disk drive.*

4. Select another operation (name) if desired as the same way.

5. Press the **ESC** key.

6. When the predetermine time comes, the DP-5 automatically send or receive messages.

   The results of timer operation are displayed as either OK or NG at the Timer Operation List.

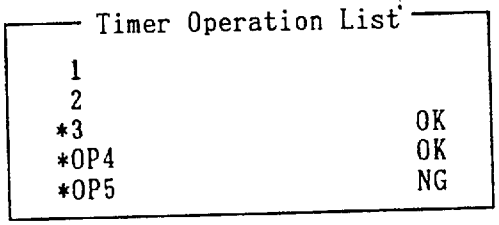


Fig. 5-11 Timer Operation List

7. To stop timer operation;

   a) Press function key **F3**.
   b) Press the [7] key.
   c) Select the operation (name) which an asterisk is attached and then press the ENTER key. Remove the all asterisks then the timer operation is cancelled.

Scramble Operation

The DP-5 can be operated in the scramble (crypto) mode, exchanging enciphered information with a receiving station.

Procedure

1. Press function key **F3** to display the OPERATE menu.

2. Press the [8] key. The SCRAMBLE TABLE LIST appears.

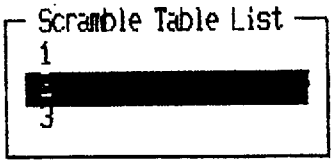


Fig. 5-12 Scramble Table List

3. Select a scramble group by using the [↓] key. And then press the **ENTER** key. The SCRA appears in inverse video at the communication status display area (See Fig. 5-14).

   Your message will be transmitted and encrypted as designated on the scramble code menu. Therefore the scramble code of the station which is to receive the message must be in agreement with your own.

4. To stop an encrypted message;

   a) Press function key **F3**.
   b) Press the [8] key.
   c) The SCRA disappears and the scramble operation stops.

Transmitter High Tension Control

The transmitter high tension of a Furuno make radio which has the high tension control at operation panel can be switched on and off from the keyboard at the DIRC and CW mode.

Procedure

1. Confirm that the communication mode is DIRC or CW at the communication status display (See Fig. 5-14).

2. Press function key F3 and then the [9] key.

3. The HT in inverse video appears and the high tension is applied to the transmitter unit.

4. To switch off the transmitter high tension, do the same procedure above. The HT disappears.

Frequency Scanning

Radio equipment scans a group of operator-selected frequencies, and stops scanning when an incoming signal is received.

Procedure

1. Press function key **F3** and then the [4] key. The SCANNING GROUP LIST appears on the screen.

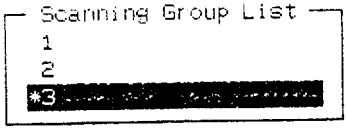


Fig. 5-13 Scan Entry Screen

2. Select a scan group. Then, press the **ENTER** key.

3. The scanning starts and the indication SCAN appears in inverse video at the communication status display area. (The name of the scan group appears at the "Station Name".)

4. To stop scanning;

   a) Press function key **F3** and then the [4] key.
   b) The scanning stops and the indication SCAN disappears.

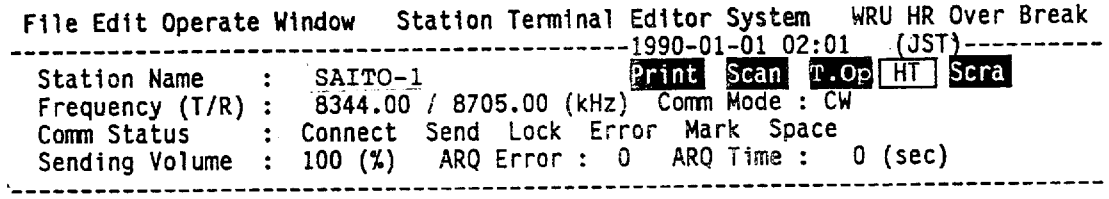


Fig. 5-14 Communication Status Display

WINDOW MENU

General

The WINDOW menu allows you to display one of the following together with the current screen:

1) working file
2) contents of the paste buffer memory
3) Navigation data (CIF or NMEA format input data)
4) calendar
5) remote controller screen
6) distress frequencies

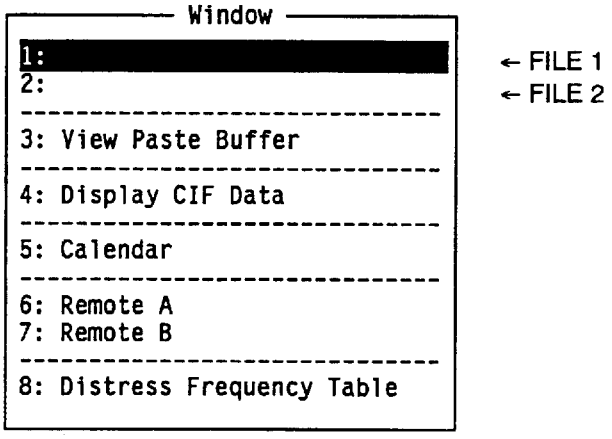


Fig. 6-1 Window Menu

Window Menu Description

File 1/File 2

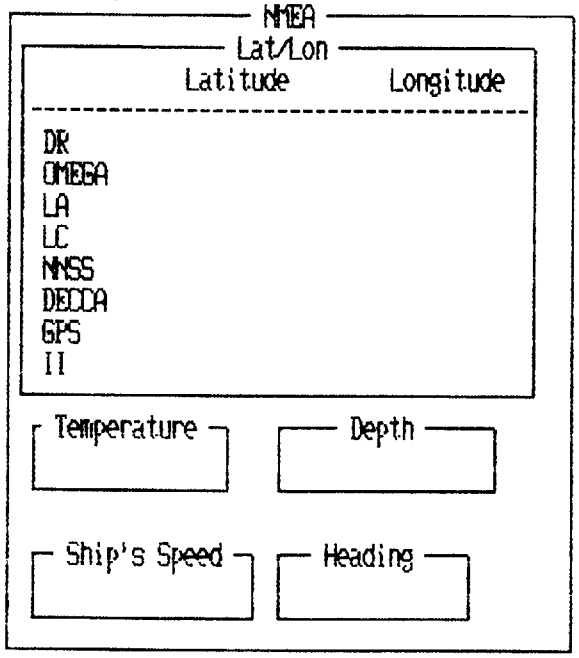
This menu selects which one of two opened files to display on the screen. Press function key **F4**. Press the [1] or [2] keys to select the file.

View Paste Buffer

This menu displays the contents of the paste buffer memory, which stores a text cut or copied on the text editor.

Display CIF (NMEA) Data

When this unit is connected to a device which outputs data in CIF or NMEA format, that data (for example, ship's L/L position, speed and course) can be displayed on the CIF (NMEA) screen. Press function key **F4** and then press the [4] key. (CIF or NMEA is selected at the TERMINAL menu.)



Data displayed depends on devices connected.

Fig. 6-2 CIF (NMEA) Screen

CALENDAR

The calendar menu can display the calendar of any combination of month and year you desire.

Press function key **F4** and then the [5] key. Enter a month. Press the [↑] key to advance the cursor to the year location. Press the **BACKSPACE** key to place the cursor at the beginning of the line and then enter (four digits) year desired.

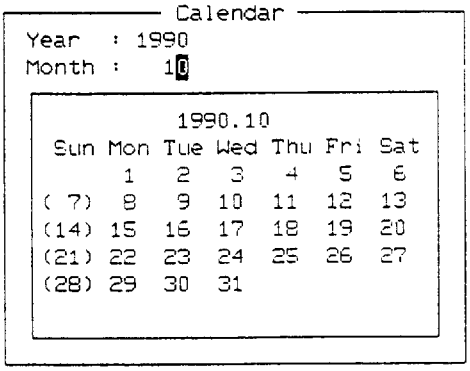


Fig. 6-3 Calendar

REMOTE A and REMOTE B

This menu permits remote control of a Furuno make transceiver, receiver or transmitter connected to Terminal REMOTE A or REMOTE B. For further details, see the Service Manual of DP-5 (Publication No. SM-E5520-0x).

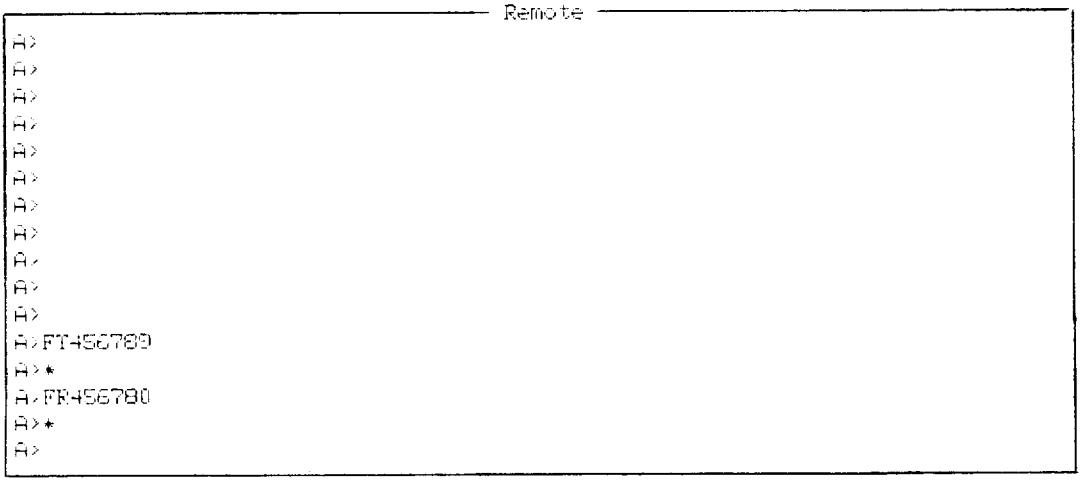


Fig. 6-4 Remote Screen

Distress Frequency Table

This menu displays all current distress frequencies. Press function key **F4** and then the [8] key. The display should look something like the figure below.

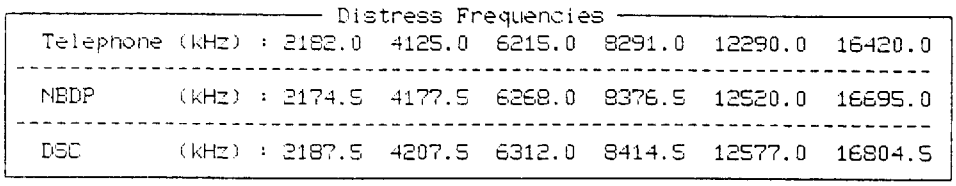


Fig. 6-5 Distress Frequency Table Screen

MARITEX

General

This chapter provides an overview to the MARITEX system. For further details, consult your MARITEX *Traffic Manual.*

What is MARITEX?

MARITEX, an acronym meaning MARItime TEleX, is a worldwide, round- the-clock, fully automatic and computerized network for maritime radiotelex. The MARITEX system is operated jointly by the Telecom Administrations of Denmark, Finland, Iceland, Norway and Sweden. The system consists of the Central Computer System in Gothenburg, Sweden, run with two high technology computers, and sub-stations in Scandinavia, Panama, Manila, and Argentina (begins operation September 1, 1992). The Central System does all the message switching and co-ordinates the sub-station resources.

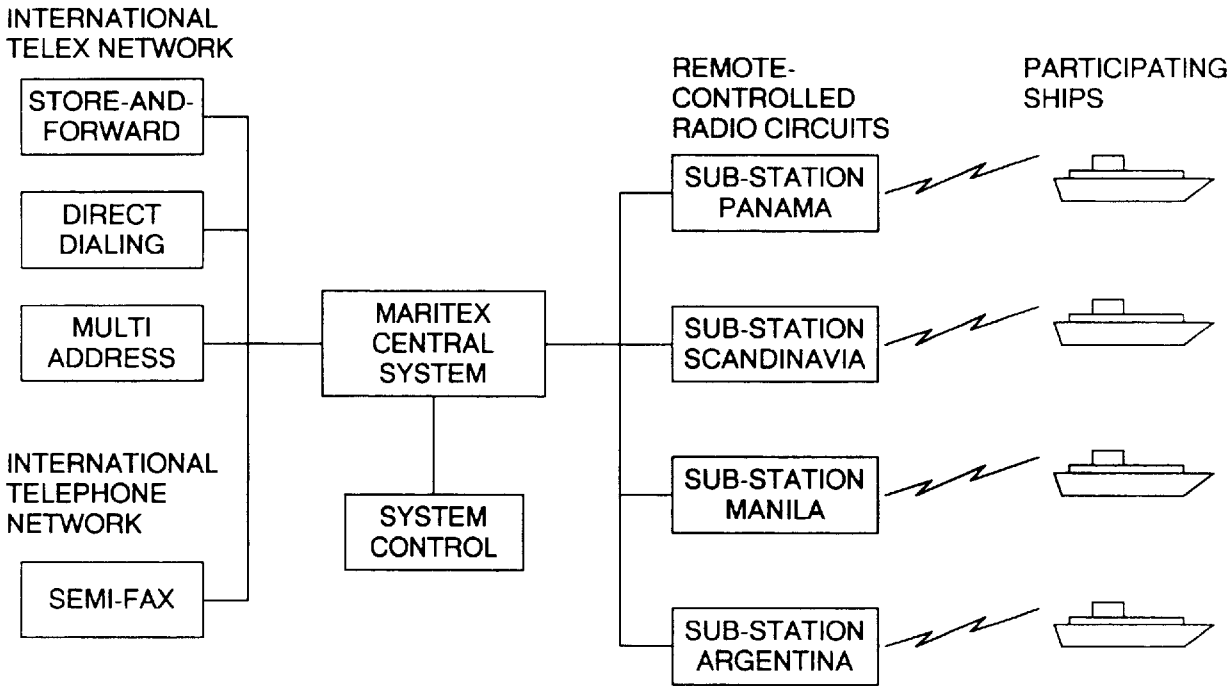


Fig. 7-1 MARITEX System and Services

MARITEX Services

MARITEX provides four main services to MARITEX subscribers:

- Store-and-forward telex
- Direct dialing
- Multi address
- Semi-fax

NOTE: *MARITEX provides both shore-to-ship and ship-to-shore services. This manual, however, describes only the ship-to-shore communication procedures.*

Preparation for Transmission

To transmit a message in the MARITEX system, you will need to register three items:

- Answerback code
- Scan group
- Station name

Answerback Code

MARITEX assigns a Telex number to all MARITEX subscribers. This number functions as answerback code. An answerback code contains the following:

OOOOO SHIP X

OOOOO: MARITEX-assigned five digit Telex code
SHIP: Ship name
X: For shipboard station, normally X is input.

The procedure for registering answerback code is the same as which appears on page 3-2. If an answerback code was registered before the commissioning of the MARITEX station a new answerback code must be entered. To enter new answerback code, contact FURUNO or authorized FURUNO agent or dealer.

Scan Group

The Central System emits a free-signal to indicate a MARITEX radio channel is in idle condition and available for ship-to-shore calls. The free-signal is detected and recognized by the shipboard equipment as a permission to start the transmission. Then, the shipboard operator initiates a call.

You can scan search for the free-signal automatically by registering MARITEX radio channels in scan group(s). The procedure for registering scan groups for MARITEX use is the same as that which appears on page 3-8.

1. Press function key **F5** to display the STATION menu.

2. Press [3] to select Scan Entry. The screen should look something like Fig. 7-2.

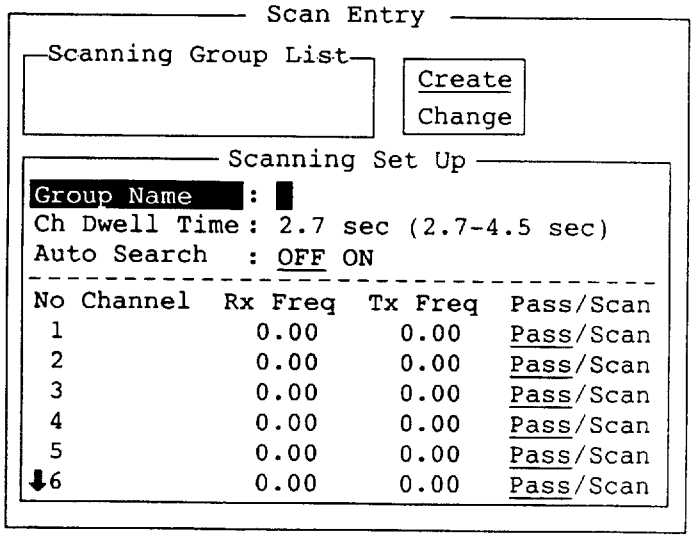


Fig. 7-2 Scan Entry Screen

The top right-hand side box contains the words "Create" and "Change" and one is underlined. If there are scan groups registered "Change" is underlined. Otherwise, "Create" is underlined. If "Create" is not underlined, set the underline beneath it by pressing [→], [↑] and **ENTER** in that order.

3. "Group Name" appears in inverse video, meaning you can enter scan group name. Enter scan group name; for example, MARITEX-A.

4. Press the [↓] key to advance the cursor to "Ch Dwell Time." The dwell times is the time the receiver waits on each channel before it selects the next channel. The factory is setting is 2.7 seconds. If you do not need to change dwell time, go to the next step.

5. Press the [↓] key to advance the cursor to "Auto Search." To have your radio equipment stop scanning when it finds the strongest (S/N ratio) free-signal frequency, turn on Auto Search. In the off setting, scanning starts and stops with the first-received free-signal frequency. Adjust the underline by the arrow keys to select ON or OFF.

6. Press [↓] to place the cursor on the No.1 line. Enter scan group name; for example, MARITEX-A. Then enter ITU channel or user channel. Refer to Table 7-1 (on the next page) for MARITEX radio channel information.

7. Press [↓] to advance the cursor to the "No.2" line. Enter channel number. Repeat this procedure for other channels, up to 20.

8. Press **ENTER**.

9. Press **ENTER** again to register scan group.

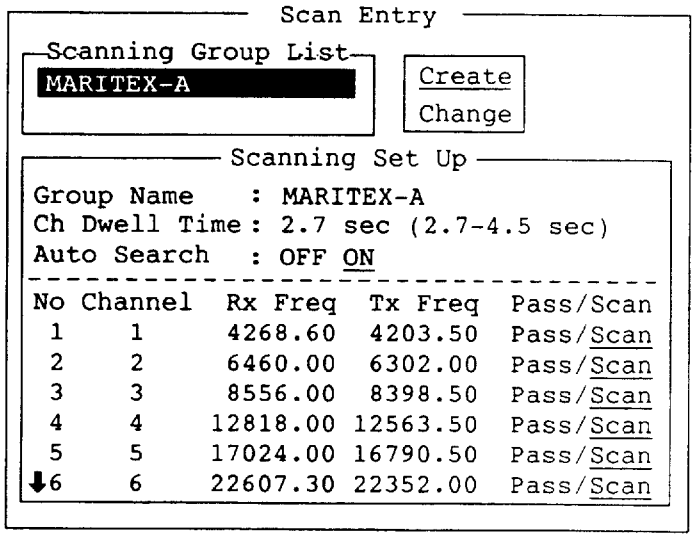


Fig. 7-3 Scan Entry Screen

10. To enter another scan group, press the right arrow key to select "Create" and press **ENTER**. Repeat steps 3 through 8 above.

Table 7-1 MARITEX Channels

ITU Channel	MARITEX No.	Coast Station TX (kHz)	Ship Station TX (kHz)	Location
UP	A7	2423.5	3267.5	SWEDEN
UP	B7	2716.0	2477.0	SWEDEN
UP	D7	1905.0	2222.0	SWEDEN
UP	A1	4268.6	4203.5	SWEDEN
409	B1	4214.5	4176.5	SWEDEN
414	C1	4216.5	4179.0	SWEDEN
UP	A2	6460.0	6302.0	SWEDEN
601	B2	6314.5	6263.0	SWEDEN
619	C2	6323.0	6272.0	SWEDEN
UP	A3	8556.0	8398.5	SWEDEN
807	B3	8419.5	8379.5	SWEDEN
824	C3	8428.0	8388.0	SWEDEN
UP	A4	12818.0	12563.5	SWEDEN
1206	B4	12582.0	12479.5	SWEDEN
1224	C4	12591.0	12488.5	SWEDEN
UP	A5	17024.0	16790.5	SWEDEN
1614	B5	16813.5	16690.0	SWEDEN
1664	C5	16838.0	16715.0	SWEDEN
1657	C7	16834.5	16711.5	SWEDEN
1605	D2	16809.0	16685.6	NORWAY
UP	A6	22607.3	22352.0	SWEDEN
2207	B6	22379.5	22287.5	SWEDEN
2232	C6	22392.0	22300.0	SWEDEN
2205	E7	22378.5	22286.5	NORWAY
817	D3	8424.5	8384.5	PANAMA
1208	D4	12583.0	12480.5	PANAMA
1633	D5	16822.5	16699.5	PANAMA
2231	D6	22391.5	22299.5	PANAMA
823	E3	8427.5	8387.5	PHILIPPINES
1215	E4	12586.5	12484.0	PHILIPPINES
1603	E5	16808.0	16684.5	PHILIPPINES
2213	E6	22382.5	22290.5	PHILIPPINES
840	F3	8436.0	8396.0	ARGENTINA
1250	F4	12604.0	12501.5	ARGENTINA
1621	F5	16817.0	16693.5	ARGENTINA
2240	F6	22396.0	22304.0	ARGENTINA

Valid from September 1, 1992
UP means no ITU channel assigned. You can use register these as user channels.

Station Name

The next step is to enter station name. The procedure is the same as the procedure shown on page 3-5. The station list provides abbreviated dialing with storage for up to 50 stations.

1. Press function key **F5** followed by **ENTER** or [1] key. The STATION ENTRY screen appears.

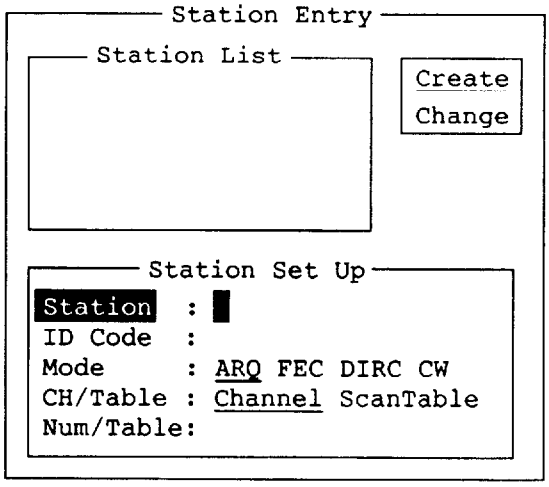


Fig. 7-4 Station Entry Screen

2. At the top right-hand side of the display, the underline is beneath "Create" or "Change." If "Create" is not underlined, set the underline beneath it by pressing [→], [↑] and **ENTER** in that order.

   The cursor advances to the Station line. Enter station name, up to 20 characters; for example, MARITEX.

3. Press the [↓] key to go to the ID Code line. Enter station ID code; the coast station selective call number common to all stations is **2950**.

4. Press the [↓] key to go to the Mode line. MODE and ARQ appear in inverse video. The MARITEX system uses ARQ mode.

5. Press [↓] [→] to set the cursor on "Scantable."

6. Press [↓]. "Num/Table" appears in inverse video and the message "Hit space key to display the list" is displayed.

7. Press the space bar. The Scanning Group List appears.

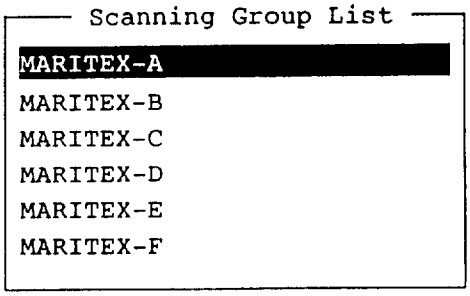


Fig. 7-5 Scanning Group List

8. Press [↓][↑] to select scan group name. For example, select MARITEX-A.

9. Press **ENTER**. Then, the scan group entered is assigned MARITEX as station name and 2950 as ID number. To enter another station name, repeat the above procedure from step 2. To establish the connection with a maritex station,

Note: To establish the connection with a maritex station, the receiving frequencies in the scan group registered are scanned to detect a free signal from the station. If the free signal is detected, a message will be automatically transmitted to the station.

Preparation of Program for Automatic Transmission

This section shows you how to prepare the programs necessary for automatic message transmission. The programs, which you can save to the main memory or a floppy disk for future use, enable unattended automatic transmission.

The program for automatic transmission is called macrofile. You will need several types of macrofiles depending on the MARITEX service to be utilized.

Commands

The tables which follow describe the commands for automatic transmission.

- Table 7-2 describes the commands processed by the DP-5, and
- Tables 7-3 and 7-4 describe the commands processed by MARITEX stations.

Table 7-2 Commands Processed by the DP-5

Command (prefixed by @)	Parameter	Content
CALL	S: Station Name I: ID	Calling station name and ID on assigned parameter
FREE (support command for CALL)	Two digits 0 – 99 min.	Free-signal searching time according to assigned parameter (factory setting: 10 min.)
RETRY (support command for CALL)	Two digits 0 – 99 min.	Calling according to assigned parameter (factory setting: 10 min.)
CASE	Text	Used to receive a message (designated by parameter) transmitted by a coast station.
TIMEOUT (support command for CASE)	Two digits 1 – 99 min.	Time allotted for reception of message by CASE command.
SEND	Text	Text transmitted according to assigned parameters.
	M: File Name D: File Name	File transmitted according to assigned parameter (M: Main memory, D: floppy Disk)
WRU HR OVER BREAK	NONE	Function keys F8 – F12.
DISPLAY	Text	Text of message appears
INPUT	NONE	Waiting for keyboard input Transmit keyboard input message

Table 7-3 shows the commands processed by MARITEX stations. After reception of "GA + ?", enter appropriate short-code command.

Table 7-3 MARITEX Short-Code Commands

Command	Usage
TLX ..... +	Store-and-forward Telex
DIRTLX ..... +	Direct dialing Telex
MULTI ..... +	Multi address
FAX ..... +	Semi-fax
MSG +	To request pending messages from the shore
NNNN +	To terminate a message
BRK +	To clear the radio circuit

Table 7-4 Other MARITEX Short-Code Commands

Command	Usage
POS +	Transmission of ship position reports
URG +	Safety, urgency and distress messages
MED +	To request medical advice
LTR +	For MARITEX letters mailed from the Operations Center to destinations world wide
TST +	Request to MARITEX to send a test message consisting of all Telex characters
MRK +	Request to MARITEX to send a continuous mark tone for 1 minute

NOTE: *For other supporting and facility commands, consult the MARITEX Traffic Manual.*

Store-and-Forward Telex

The following is the sequence of events in transmission of Telex message in MARITEX.

1. Shipboard station sends message to MARITEX coast station.

2. MARITEX coast station stores message in memory buffer.

3. Shipboard station and MARITEX coast station clear the radio circuit.

4. MARITEX station sends message to subscriber designated.

No.	Procedure	Display on DP-5	Remarks
1	Call MARITEX.	CONNECT appears in inverse video, and audible bell signal sounds.	Free-signal found; radio circuit ready.
2	Transmit WRU signal.	MARITEX S 26 X X X SHIP X GA + ?	Initial identity exchange between coast station and shipboard station.
3	Key in Telex number of subscriber. For example: (Hong Kong) 12345		
	TLX80212345 +	MSG + ?	Request to start message transmission.
4	Transmit message file.		Message transmission
5	When message is transmitted completely, type NNNN.	26 X X X SHIP X MARITEX S DURATION DATE GA + ?	Transmit your answerback code. Receive MARITEX station's answerback code. Tx time and date appear on DP-5.
6	Transmit BREAK command to clear radio circuit.		

Procedure for preparing a macrofile for store-and-forward Telex

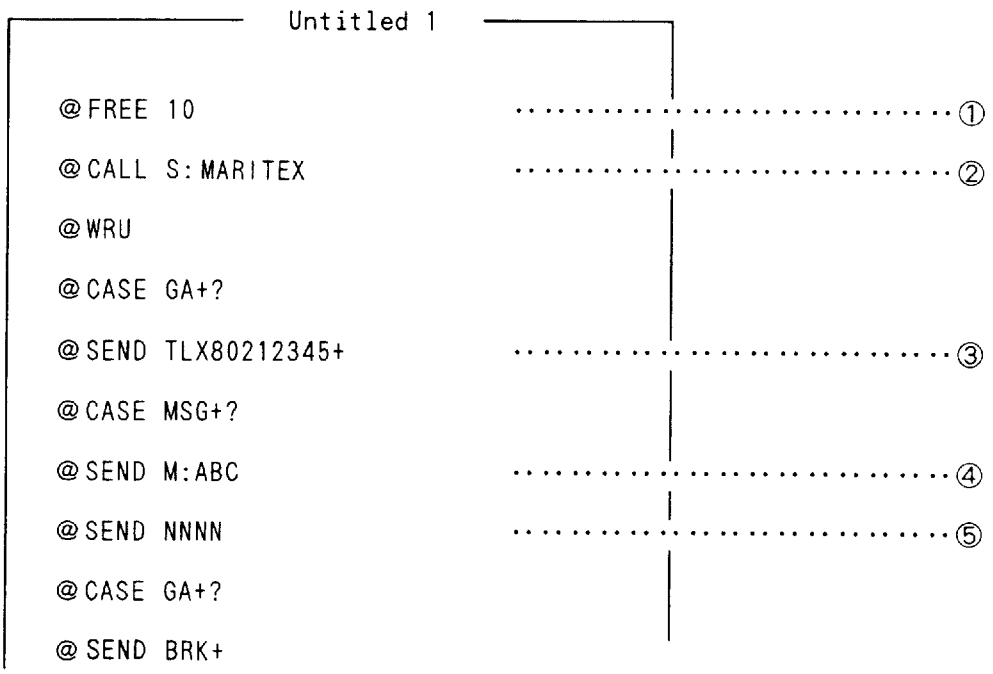
You will need a macrofile to enable automatic message transmission on store-and-forward Telex. The procedure which follows shows you how to prepare a macrofile. After preparing it, save it to main memory or a floppy disk for future use.

1. Press function key **F1** to display the FILE menu.

2. Press [1] to display the text editor screen.

3. Make a program to send a message by automatic connection and transmission.

   The figure below shows the minimum information required to send a store-and-forward Telex message in MARITEX.



1. Free-signal search time (10 minutes)
2. Station name (for example, MARITEX)
   Who are you?
   Station identity exchange
3. Subscriber's Telex number (in example, 802 is country code for Hong Kong) for store-and-forward mode
4. Location and name of file message (M: Main memory, D: floppy Disk)
5. Request for termination of message

Fig. 7-6 Example Macrofile for Store-and-Forward Telex

4. Press function key **F1** to display the File menu.

5. Press [5]. The Save prompt appears on the display.

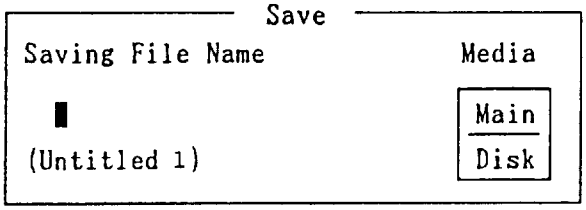


Fig. 7-7 Save Prompt

6. Enter a file name as follows.

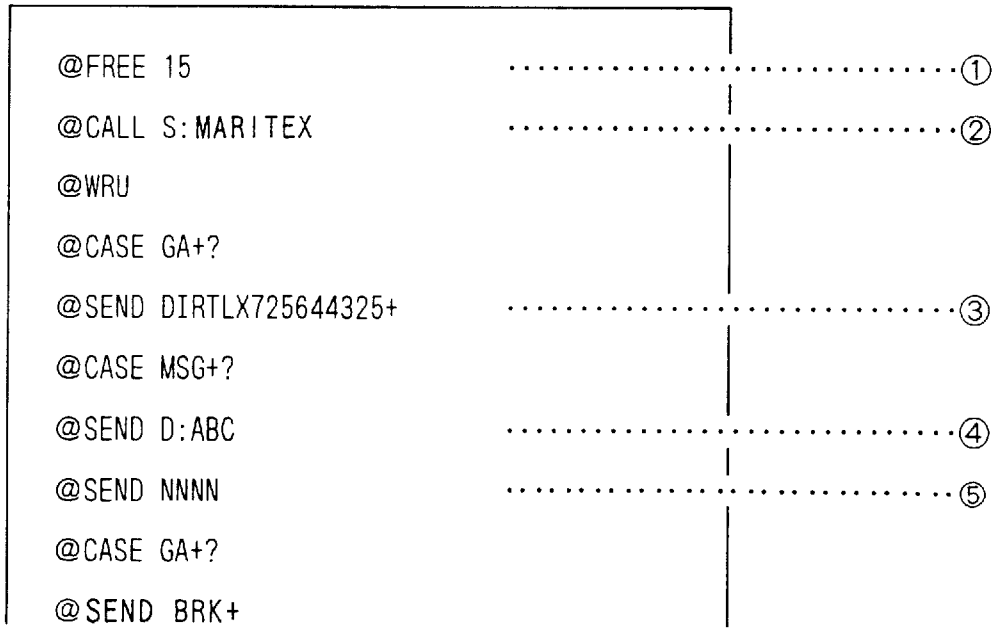
OOOOOOOO. MCR
File Name (max. 8 characters)
Extension Name

7. You may save the file to either a floppy disk or the main memory. In the Media box on the Save screen, place the underline under Main for main memory, or Disk for floppy disk.

8. Press **ENTER** to save file.

Direct Dialing

The direct dialing features allows you to contact a land subscriber via MARITEX. Below is an example of a macrofile to use when using the direct dialing feature.



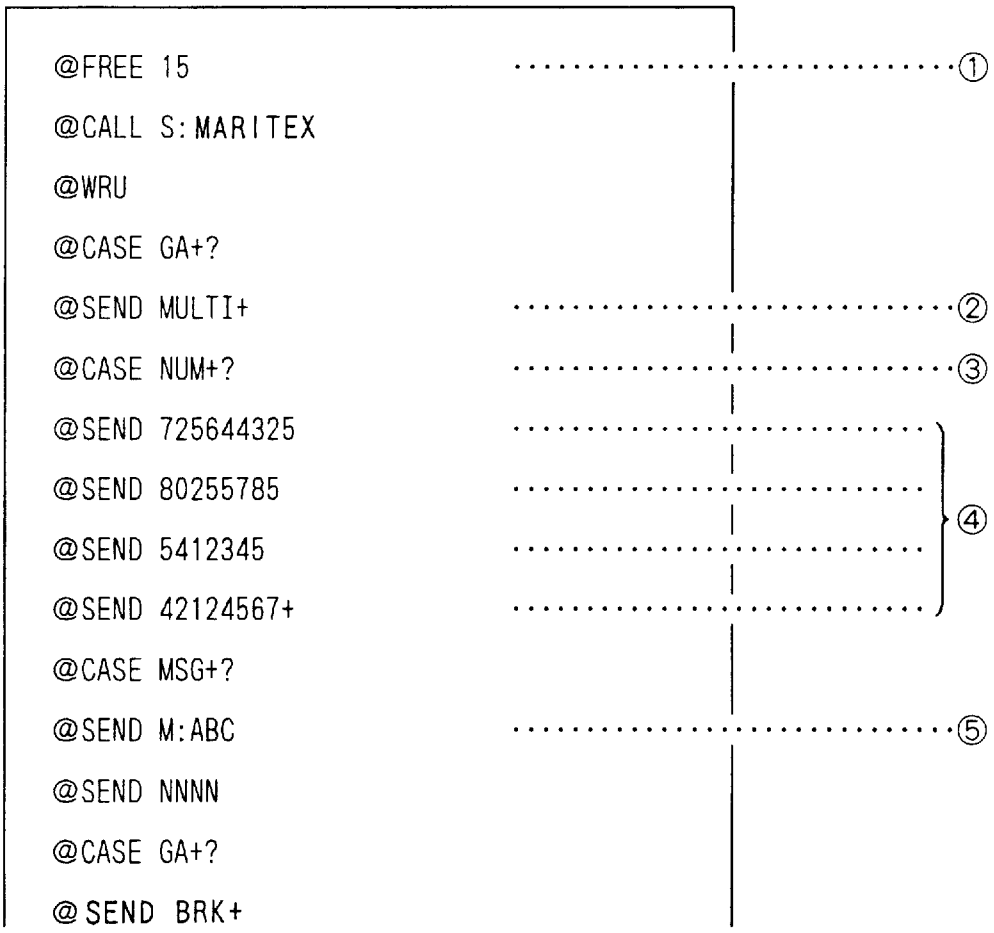
1. Free-signal search time (15 minutes)
2. Station name
   Who are you?
   Station identity exchange
3. Subscriber's Telex number (in example, 72 is country code for Japan) for direct dialing mode
4. Location and name of file message (M: Main memory, D: floppy Disk)
5. Request for termination of message

Fig. 7-8 Example Macrofile for Direct Dialing

No.	Procedure	Display on DP-5	Remarks
1	Call MARITEX.	CONNECT appears in inverse video, and audible bell signal sounds.	Free-signal found; radio circuit ready.
2	Transmit WRU signal.	MARITEX S 26 X X X SHIP X GA + ?	Initial identity exchange between coast station and shipboard station.
3	Key in Telex number of subscriber. For example: (Japan) 725644325 DIRTLX725644325 +	12:20 MOM 5644325 FURUNO J MSG + ?	Request to start message transmission.
4	Transmit prepared text file, or input message manually through keyboard.		Message transmission
5	When finished, type NNNN.	26 X X X SHIP X 5644325 FURUNO J MARITEX S DURATION DATE GA + ?	Transmit your answerback code. Receive MARITEX station's answerback code. Tx time and date appear on DP-5.
6	Transmit BREAK command to clear radio circuit.		

Multi Address

The figure which follows shows an example of a macrofile for multi address use.



① Free-signal search time (15 minutes)
② Command for multi address message
③ Search for "NUM + ?" sent by MARITEX station
④ Addresses of subscribers. Last address contains " + " code.
⑤ Location and name of message file (M: Main memory, D: floppy Disk)

Fig. 7-9 Example of Macrofile for use in Multi Address

Semi-fax

In the Semi-fax option, MARITEX converts ship-to-shore direction telex message to facsimile and retransmits it via the telephone network.

The figure below shows and example of a macrofile for use in Semi-fax. The macrofile for Semi-fax is the same as the macrofile for store-and-forward and direct dialing except for the FAX command.

```
@FREE 10
@CALL S:MARITEX
@WRU
@CASE GA+?
@SEND FAX802123456+ ..... ①
@CASE MSG+?
@SEND M:ABC
@SEND NNNN
@CASE GA+?
@SEND BRK+
```

Fig. 7-10 Example of Macrofile for use in Semi-fax

Transmission of Telex in MARITEX System

This section describes how to transmit a message in MARITEX.

Preparation for Transmission

1. Register answerback code (Telex number assigned by MARITEX).

2. Register MARITEX frequency and channel to scan group.

3. Register station name including scan group name.

4. Retrieve suitable macrofile. Include station name and a message file name. Type message and save file to memory.

5. Open macro operation menu and select macrofile. (See next page for details.)
   Your message will be transmitted automatically. Below is the sequence of automatic Telex message transmission.

   1) Search for free-signal
   2) Call MARITEX station on MARITEX radio channel.
   3) After connection is established, identity exchange
   4) Transmission of service category and subscriber's address
   5) Transmission of message
   6) Transmission of "termination of message" signal
   7) Identity exchange
   8) Clearing of radio circuit

Actual Transmission

Below is the basic procedure for transmitting a prepared message in the MARITEX system.

1. Press **F3** to display Operate menu, and then press [↓] to select "Macro Operation".

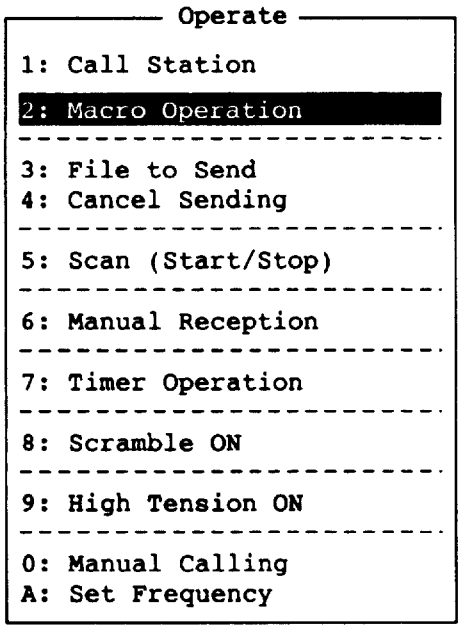


Fig. 7-11 Operate Menu

2. Press [Enter]. The Call Macro screen appears.

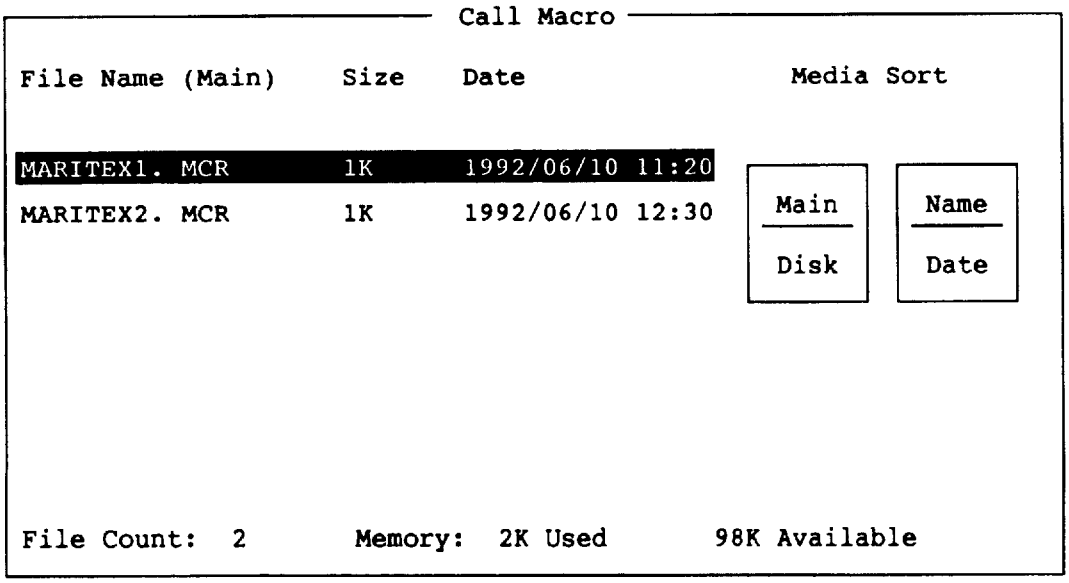


Fig. 7-12 Call Macro Screen

3. Press [↓] to select desired macrofile. The extension "MCR" indicates macrofile.

4. Press **ENTER**. The "Wait for Free Signal" indication appears. Your message will be transmitted automatically.

PRINTER (optional supply)

Refer to operator's manual of the printer PP-500.

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MAINTENANCE AND TROUBLESHOOTING

Maintenance

The DP-5 provides many years of trouble-free performance provided it is properly installed and maintained. To keep it operating in top condition you should establish a regular maintenance program and it should include at least the following:

Cleaning of the CRT

Wipe of accumulated dust with a soft cloth. For stubborn dirt, an anti-static cleaner may be used. **Do not use solvents to clean the CRT. They may remove paint and markings.**

Connectors & Earth Connection

Periodically check the connectors for proper seating and the earth connection for rust. Remove rust to maintain a good ground system.

Floppy Disk Drive

Clean the floppy disk drive head regularly to prevent erasure of information stored on disks.

Troubleshooting

Power Supply

If the power cannot be applied (power lamp does not light):

1) Check for loosened power cable connector on the rear of the unit. Check that the ship's mains main switch is turned on. Confirm that power (10-40 VDC) is present at the connector (pin #1: (+), pin #2: (-)).

2) Check the unit for tripped breaker. (The breaker is on the rear of the unit.) If it has tripped, reset it.

Self Test

This unit has several self-tests which check it for proper operation.

To call up the SELF TEST menu, press function key **F8**. Select CHANGE by pressing the [→] key. And then select SELF TEST by pressing [↓] key several times followed by pressing the **ENTER** key. Fig. 9-1 shows page 1 and page 2 of the SELF TEST menu.

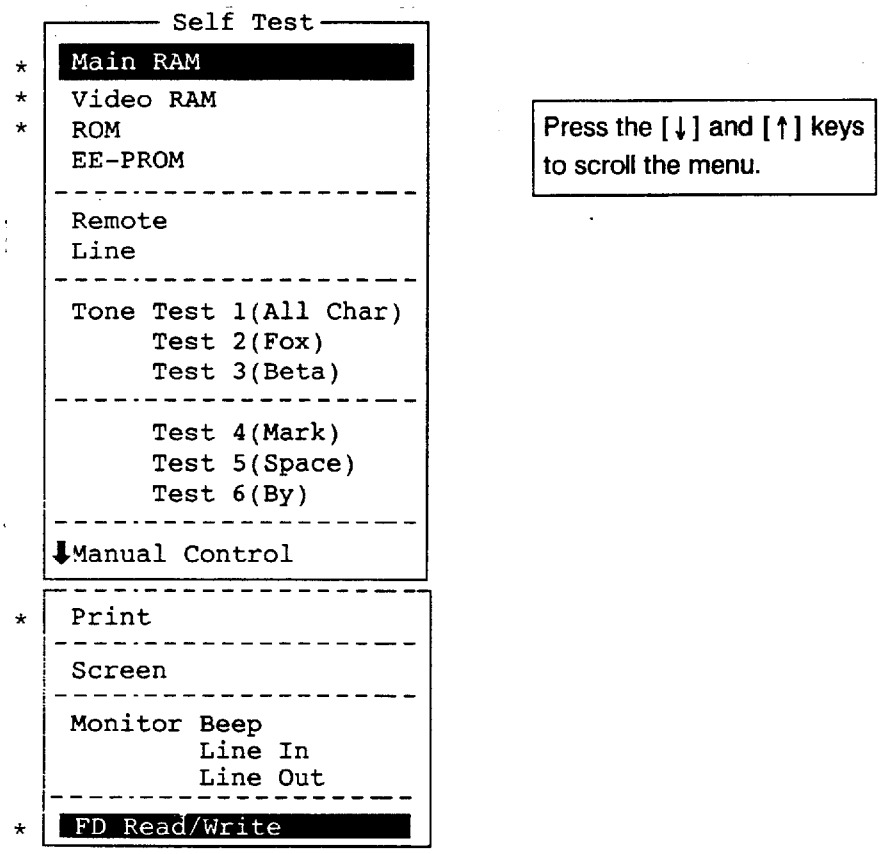


Fig. 9-1 Self Test Menu

Procedure

Select a test by operating the up and down arrow keys followed by pressing the **ENTER** key. You may terminate a self test anytime by pressing the **ENTER** key. Control is returned to the self test menu.

When you execute all items, it takes about 15 minutes. It is sufficient to execute the items marked * in Figure 9-1 for periodical check.

MAIN RAM (Memory) Test

This test checks each bank of the Main RAM (in sequential order) for proper operation. The result of each check is shown as OK (normal) or NG (No Good, error). When the check is completed, MAIN RAM CHECK COMPLETED. PRESS ANY KEY TO ESCAPE appears on the CRT. You may press any key to return control to the self test menu.

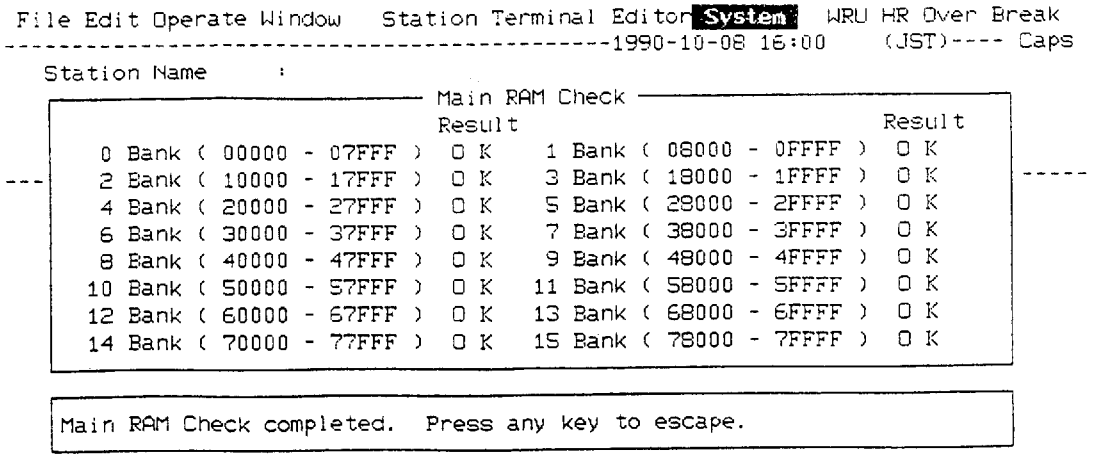


Fig. 9-2 MAIN RAM Test Screen

VIDEO RAM Test

This test checks the Video RAM for proper operation. The unit checks the two banks of the Video RAM in sequential order, displaying the result of the check as either OK (normal) or NG (No Good, error). When the check is completed, VIDEO RAM CHECK COMPLETED appears on the CRT. You may press any key to return control to the self test menu.

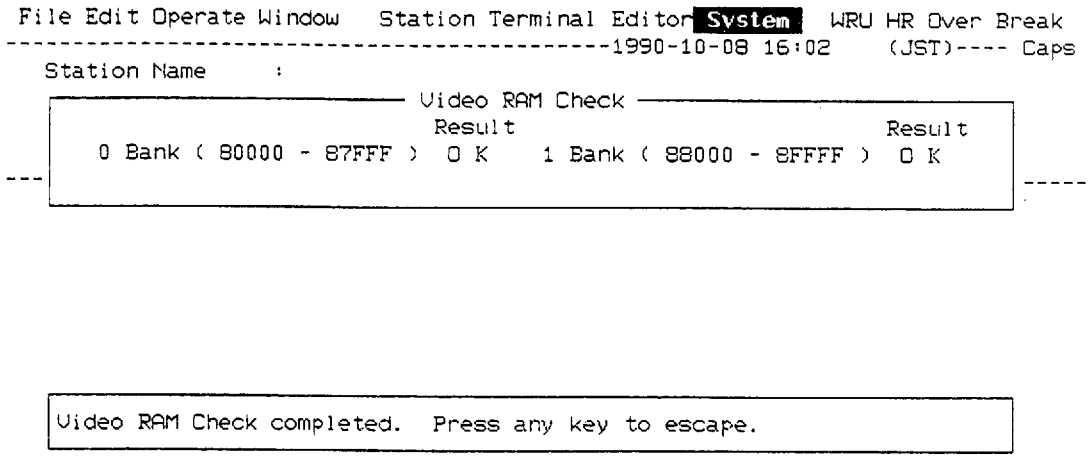


Fig. 9-3 VIDEO RAM Test Screen

ROM Test

You may check the ROM for proper operation. The result of the test is shown as OK or NG. When the check is completed, ROM CHECK COMPLETED appears. Press any key to return to the self-test menu.

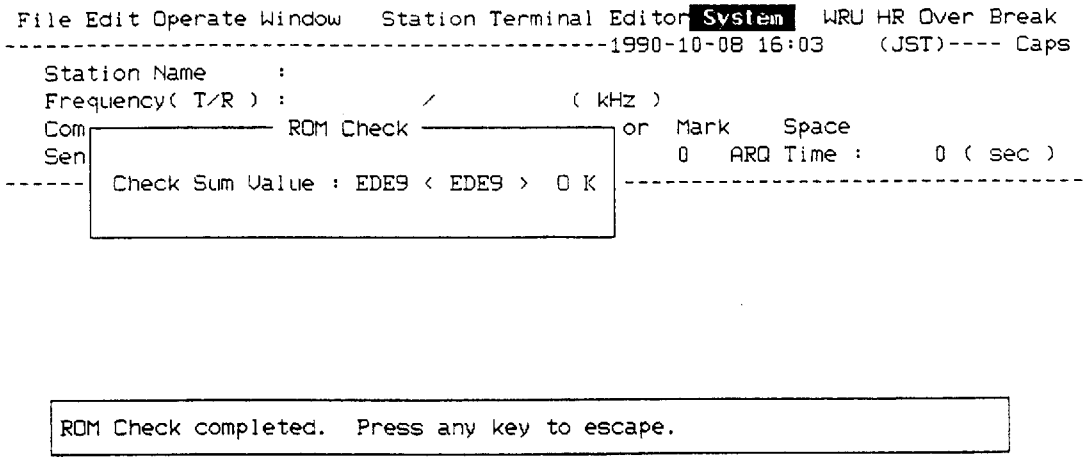


Fig. 9-4 ROM Test Screen

EE-PROM Test

The check of the EE-PROM takes about ten minutes to complete. When the check is completed, EE-PROM CHECK COMPLETED appears. Press any key to return to the self-test menu.

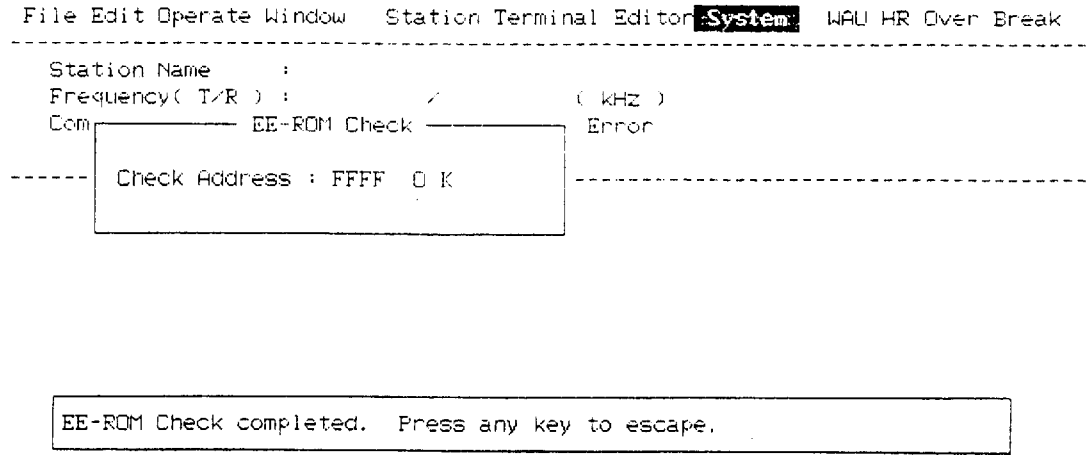


Fig. 9-5 EE-PROM Test Screen

REMOTE Test

This test checks for proper data exchange between the DP-5 and connected transceiver. If the result of the test is NG, check the I/O interface on the Control Board. Upon completion of the test, REMOTE CHECK COMPLETED appears. Press any key to return to the self-test menu.

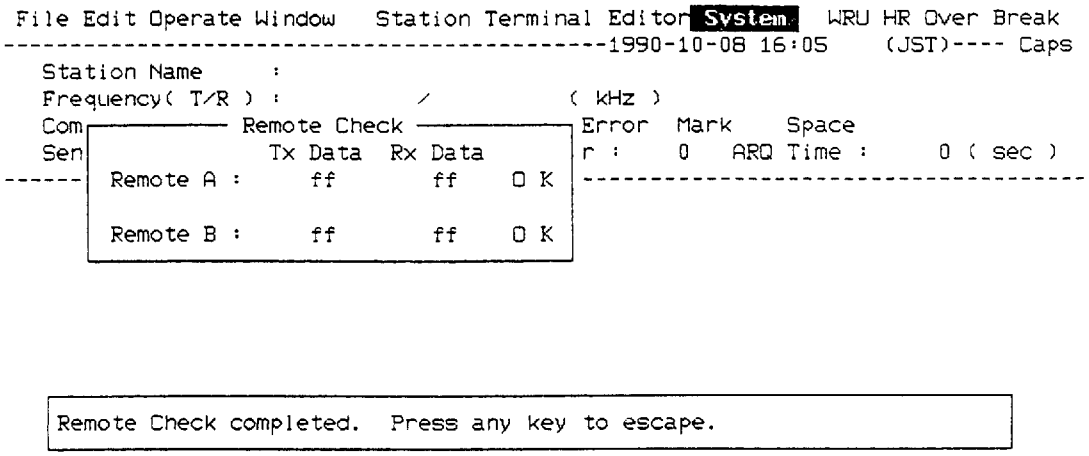


Fig. 9-6 REMOTE Test Screen

LINE Test

The Line test verifies operation of the tone modulator/demodulator and associated filtering and timing circuitry. Upon completion of the test, LINE TEST COMPLETED appears. Press any key to return to the self-test menu.

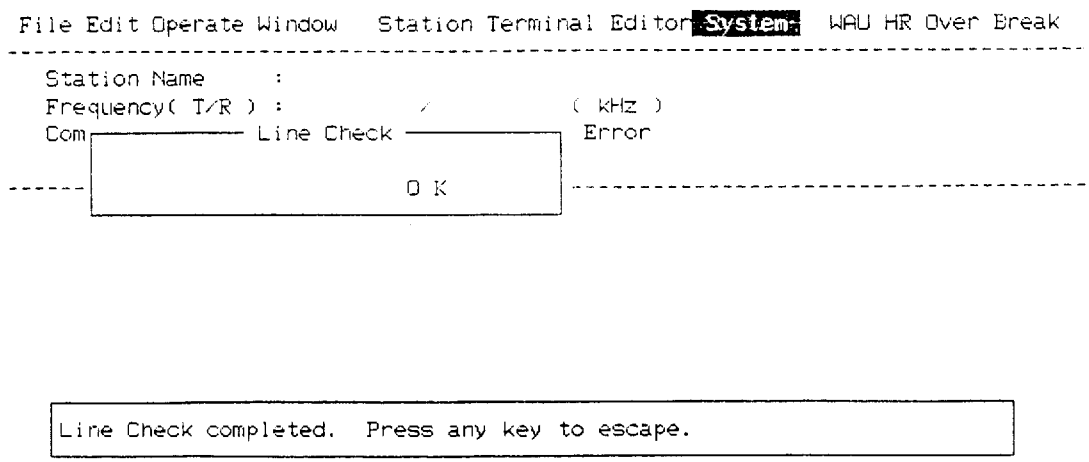


Fig. 9-7 LINE Test Screen

TONE Test 1 (All Characters)

This test (continuously) checks for proper transmission of all figures, letters and codes. To conduct the test, call a station in either ARQ or FEC modes. Further, it is necessary to set the ECHO to ON on the terminal menu. Execute the test, confirming that all characters are transmitted correctly. EXECUTING TONE TEST 1 appears during the testing. Since the test is conducted continuously, you may press any key to stop the test and return to the self-test menu.

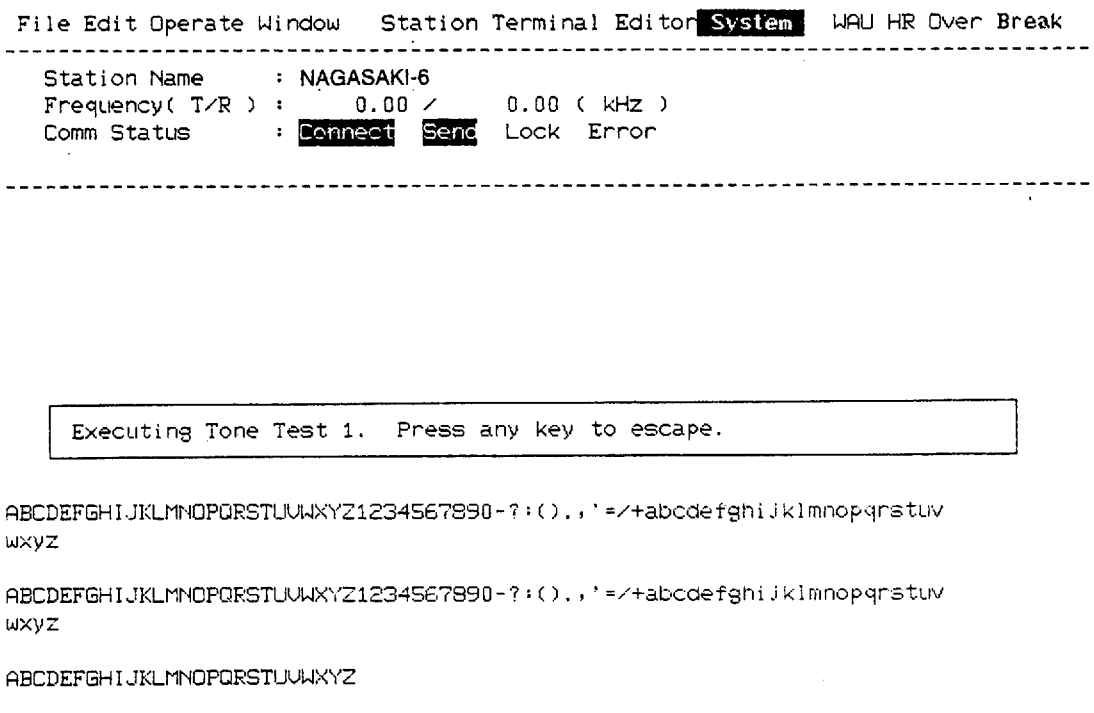


Fig. 9-8 All Characters Test Screen

TONE Test 2 (Fox)

This test (continuously) checks for proper transmission of the test message THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG 0123456789. In order to conduct the test, call a station in either ARQ or FEC Modes. Execute the test, confirming that the phrase is transmitted correctly. EXECUTING TONE TEST 2 appears on the display during the testing. To escape from the test, press any key.

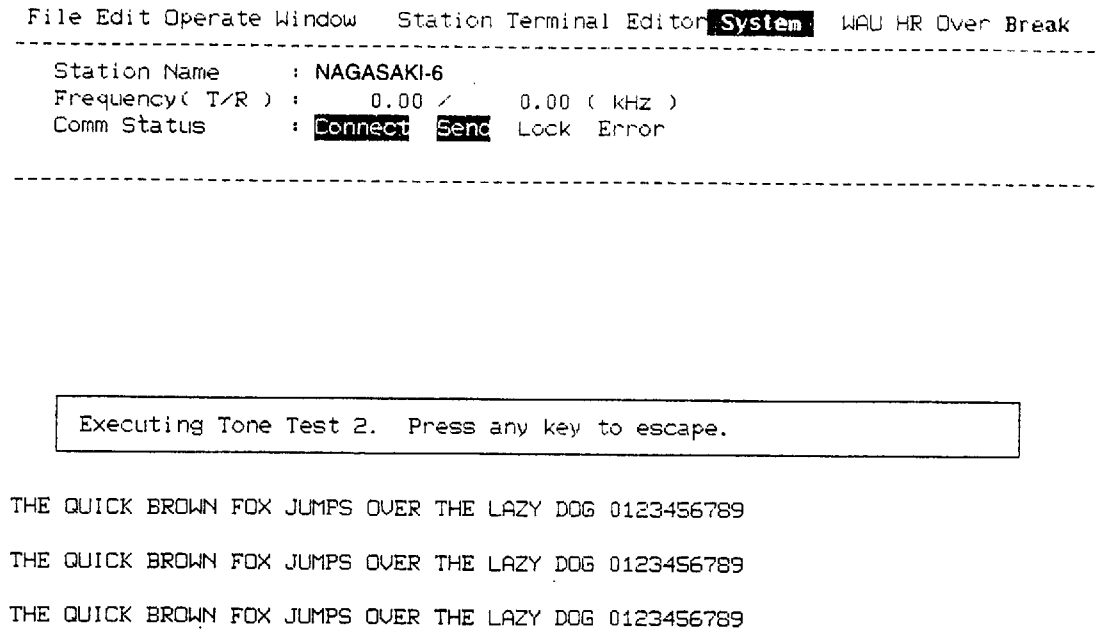


Fig. 9-9 FOX Transmission Test

TONE Test 3 (Beta)

You may check for proper transmission of the idle signal β. Call up a station using the ARQ mode. Execute the test, confirming that the signal is output correctly. To escape from the test, press any key.

TONE Test 4 (Mark)

This test outputs the mark signal through the LINE OUT terminal, where a frequency counter may be connected, to confirm its frequency (1615 Hz).

TONE Test 5 (Space)

TONE Test 5 verifies the space signal frequency (1785 Hz).

TONE Test 6 (BY)

This test verifies the frequency of the space B (1785 Hz) and mark Y (1615 Hz), using a spectrum analyzer.

* You can distinguish the above tone tests by monitoring the line out monitor.

MANUAL CONTROL Test

This test checks each control signal for external equipment (Transmitter/Receiver/Transceiver/Buzzer). When the test is selected the following prompt appears:

```
File Edit Operate Window   Station Terminal Editor System  WRU HR Over Break
-------------------------------------------1990-10-08 16:13    (JST)---- Caps
   Station Name       : NAGASAKI-8M
   Frequency( T/R )  :  8765.00 /  8965.00 ( kHz )
   Comm Status        : Connect  Send  Lock  Error  Mark    Space
   Sending Volume     : 100 ( % )    ARQ Error :    0   ARQ Time :     0 ( sec )
-----------------------------------------------------------------------------


 ------------------------ Manual Control ----------------------------
| Hit 1 - 8 keys to change control. Press ESC key to escape.        |
 --------------------------------------------------------------------
```

Fig. 9-10 Manual Control Test Screen

Hit keys 1-8 one by one, observing that external equipment connected functions normally. Key and corresponding control port are as follows:

1 Key .... TX KEY signal on and off
2 Key .... RX MUTE signal on and off
3 Key .... HT signal on and off
4 Key .... ALARM signal on and off
5-8 Keys .... Not used

PRINT Test

The printer can be checked for proper functioning by the print test. To escape the printer test, press the ESC key.

```
6789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[¥]^_`abcdefghijklmnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[¥]^_`abcdefghijklmnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[¥]^_`abcdefghijklmnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[¥]^_`abcdefghijklmnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[¥]^_`abcdefghijklmnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[¥]^_`abcdefghijklmnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[¥]^_`abcdefghijklmnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[¥]^_`abcdefghijklmnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[¥]^_`abcdefghijklmnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[¥]^_`abcdefghijklmnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[¥]^_`abcdefghijklmnopqrstuvwxyz{|}~
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[¥]^_`abcdefghijk
```

Fig. 9-11 Print Test Screen

SCREEN Test

This test displays a test pattern to check the CRT for error. To escape from the test, press any key.

MONITOR BEEP Test

This test lets you set the volume of the alarm monitor. Enter 0 to turn the alarm monitor off, or 1-7 to adjust the volume in ascending loudness.

```
File Edit Operate Window   Station Terminal Editor System  WRU HR Over Break
-------------------------------------------1990-10-08 16:11    (JST)---- Caps
   Station Name      : NAGASAKI-8M
   Frequency( T/R )  :  8765.00 /  8965.00 ( kHz )
   Comm Status       : Connect  Send  Lock  Error  Mark    Space
   Sending Volume    : 100 ( % )    ARQ Error :    0   ARQ Time :      0 ( sec )
-------------------------------------------------------------------------------

                          Monitor Beep Check
 Hit 0 - 7 keys to set monitor level. Press ESC key to escape.
```

Fig. 9-12 Monitor Beep Check Screen

MONITOR LINE IN/LINE OUT Test

This test generates a test signal through LINE IN and LINE OUT terminals to adjust the volume of the line in/line out monitor. Enter 0 to turn the monitor off, or a number from 1-7 for volume adjustment.

FD READ/WRITE Test

The FD READ/WRITE test checks if the floppy disk drive can write to or read from a floppy disk. To conduct the test, use a formatted floppy disk having more than 1 KB free memory. Upon completion of the test the result of the check and the indication FD READ/WRITE CHECK COMPLETED appear. Press any key to return to the self-test menu.

```
File Edit Operate Window   Station Terminal Editor System  WRU HR Over Break
-------------------------------------------1990-10-08 16:17    (JST)---- Caps
   Station Name      : NAGASAKI-8M
   Frequency( T/R )  :  8765.00 /  8965.00 ( kHz )
   Comm Status       : Connect  Send  Lock  Error  Mark    Space
   Sending Volume    : 100 ( % )    ARQ Error :    0   ARQ Time :      0 ( sec )
-------------------------------------------------------------------------------
        FD Read / Write Check
        FD Read/Write Check  OK.


 FD Read/Write Check completed.  Press any key to escape.
```

Fig. 9-13 FD Read/Write Check Screen

INSTALLATION

General

This chapter covers the installation of the DP-5 and Printer PP-500 (optional supply). The installation consists mainly of siting and mounting the display unit and the printer, connection of cables from external equipment and connection of the keyboard.

Mounting Guidelines

The DP-5 is designed for tabletop mounting. It may be installed almost anywhere provided the location satisfies the following conditions:

- The ambient temperature range is 0 - 40°C.
- Select a place where the keyboard can be easily operated while viewing the display screen.
- The length of the interface connection cable is. Keep this figure in mind when selecting a mounting location.
- Locate the unit a sufficient distance from air conditioners, heat sources and ventilation fans.
- Water splash will most assuredly harm the sensitive components inside the unit. Keep the unit away from areas subject to water splash or water spray.
- Select a place where vibration is minimal.
- Leave enough space around the sides of the unit to permit checking and maintenance and to allow for circulation of cooling air.
- Keep the unit out of direct sunlight.
- Keep the unit away from magnetic fields (telephone, refrigerator, compass, etc.)
- The floppy disk drive will not function properly if the unit is tilted more than 15 degrees.
- The CRT horizontal and vertical synchronizing frequency of the DP-5 may cause picture distortion to nearby CRT's which these frequencies are different from each other. Leave at least 10 cm space between the unit and other CRT's.
  Horizontal synchronizing frequency of DP-5: 24.5 kHz
  Vertical synchronizing frequency of DP-5: 55.4 Hz
- Keep the following compass distance

	Main Unit DP-500	Printer PP-500
Standard	1.6 m	1.0 m
Steering	1.0 m	0.5 m

Mounting

Procedure

1. Separate the mounting base from the unit by loosening the two screws at the front of the mounting base.

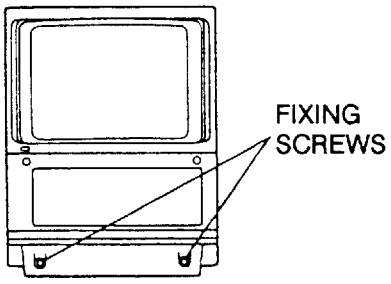


Fig. 10-1 Display Unit Front View

2. Fix the mounting base to the chosen location by using 12 tapping screws or four hex head bolts. Refer to the figure below.

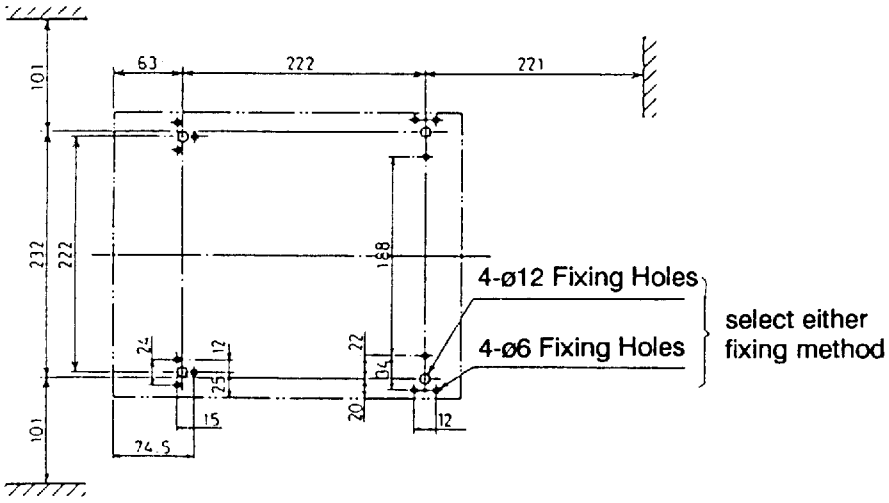


Fig. 10-2 Mounting Dimensions of the Display Unit

3. Lay the unit on top of the mounting base. Referring to the figure below, run a copper strap between the unit and the mounting base to ground the unit.

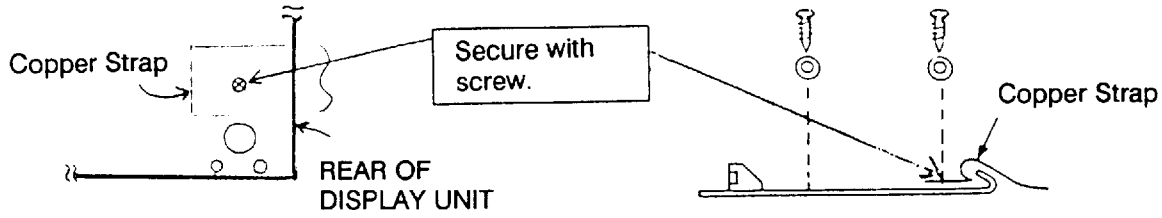


Fig. 10-3 Grounding the Display Unit

4. You should now install the printer (optional supply). The printer also is designed for tabletop mounting. Select a location which is within five meters of the DP-5. Fix the mounting bed by using four screws. Then, fix the printer by using printer mounting fixtures 1 and 2.

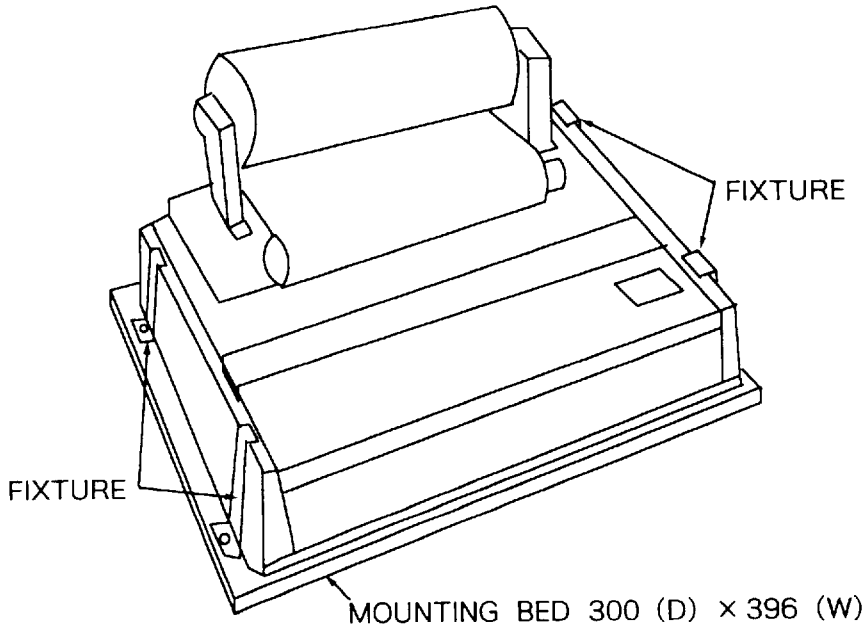
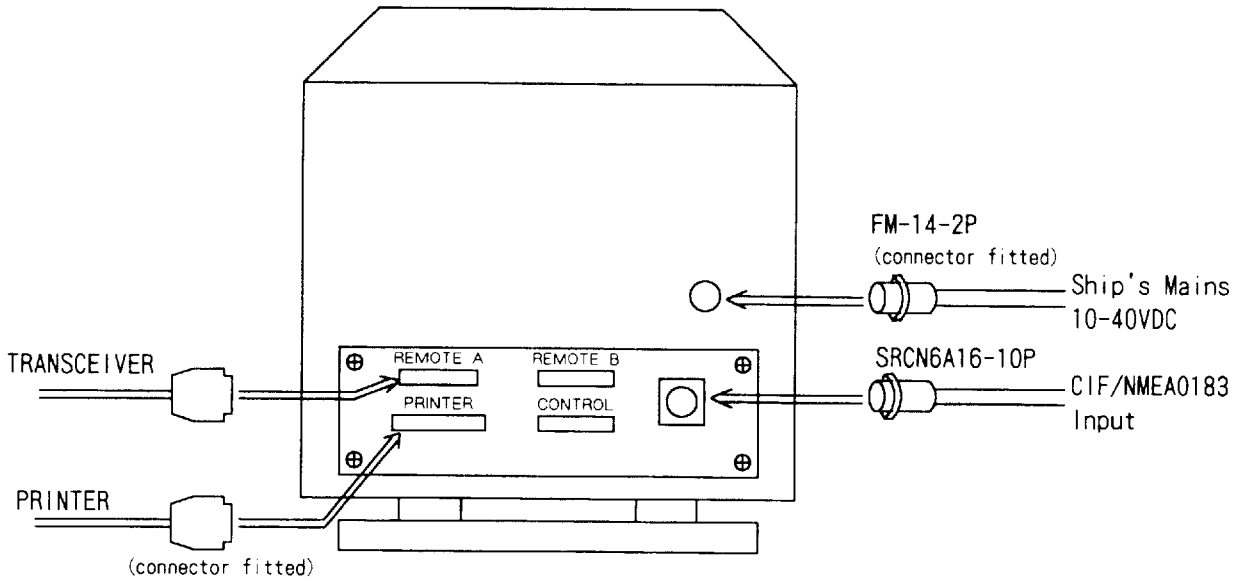


Fig. 10-4 How to Install the Printer

5. Referring to the interconnection diagram on page S-1, fit connectors to the connection cables for peripheral equipment.

6. Connect the cables to the connectors on the back of the DP-5.



NOTE: The TX KEY line inside the REMOTE A or B connector will be connected to BK line of transceiver. Note that the maximum rate of this line in 50 mA.

Fig. 10-5 Connectors on the Rear of the DP-5

7. Plug the keyboard interface cable into its connector on the DP-5. If desired, the keyboard can be fixed to the tabletop. Refer to the figure below.

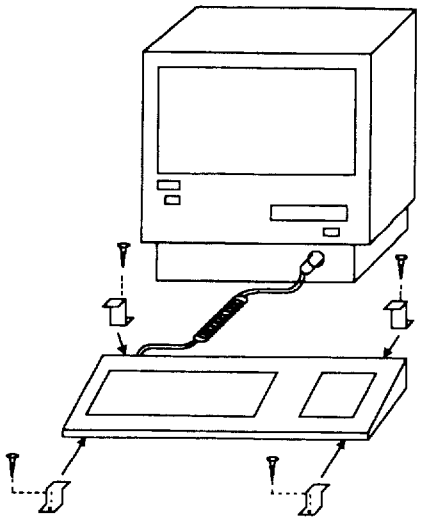


Fig. 10-6 Fixing the Keyboard

Terminal Settings

The screen for selecting communication conditions appears by pressing function key **F6**. Fig. 10-7 shows the TERMINAL screen.

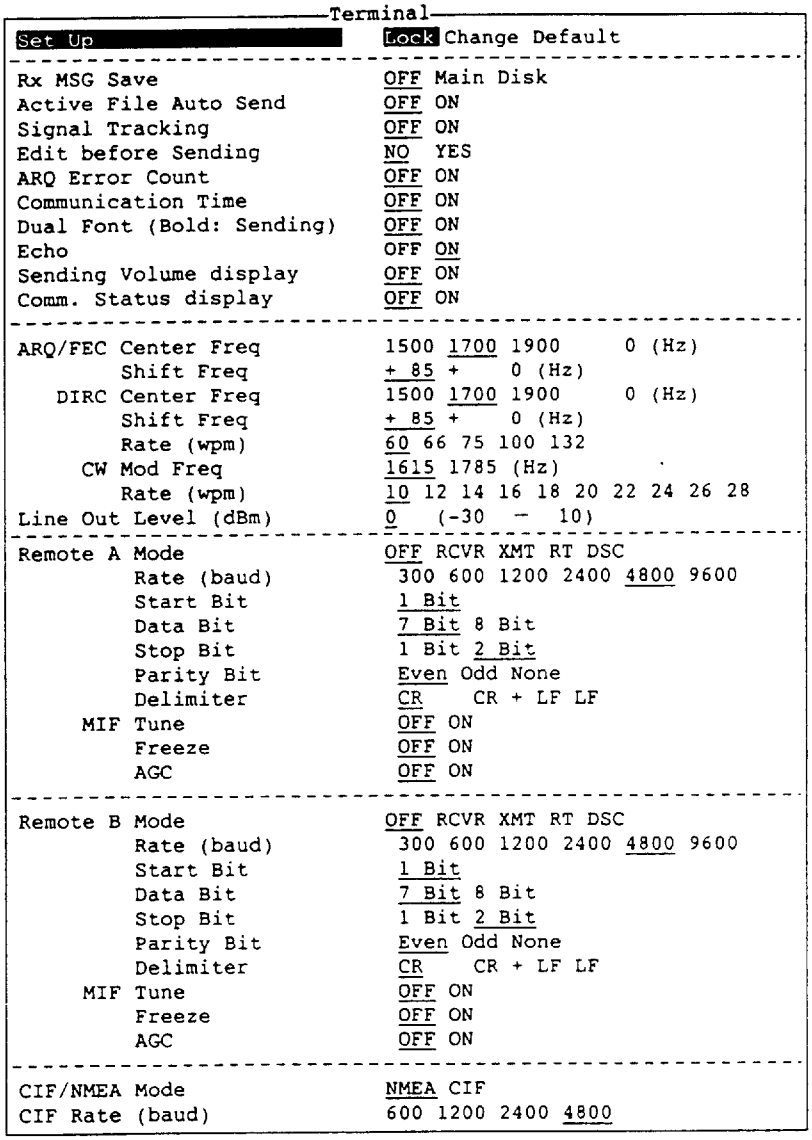


Fig. 10-7 Terminal Screen

Procedure

When the LOCK of the SET UP line is in inverse video, press [↓] key to scroll the display, to refer the items to have been set. If you want to change a setting, press the [→] key to display the CHANGE of the SET UP line in inverse video. (However, items marked with * key can not be changed.) And press the [↓] key to select a desired item, then press the [→] or [←] key to set a desired one. (The DEFAULT of the SET UP line is used only for factory adjustment.)

Menu Description

Set Up	Changes the terminal setting.
RX MSG Save	An incoming message can be saved automatically to the main memory or a floppy disk.
Active File Auto Send	When ON is selected, a message just made or one opened from the memory is automaticaly sent immediately after calling and establishing a connection with a station.
Signal Tracking	The receive filters of this unit can automatically track the incoming signals within about ±80 Hz.
Edit before Sending	No: Transmits keying operation one by one. Yes: Transmits message only when the **ENTER** key is pressed after confirming the text you just typed.
ARQ Error Count	A message transmitted with ARQ can be retransmitted up to 32 times until it is received error free.
Communicate Time	Turns the elapsed communication time display on and off.
Dual Font	When the DUAL FONT feature is on, incoming messages appear in italic-like typeface, outgoing messages in gothic.
Echo	Select ON to display an outgoing message while it is being transmitted.
Sending Volume Display	Shows percentage of message (file) transmitted, from 0-100%.
Comn. Status Display	Turns the communication status display (showing communication status, percentage of message transmitted, ARQ error rate, and ARQ time) on and off.
ARQ/FEC Center Freq *	The center AF frequency for ARQ/FEC communication mode is normally 1700 Hz. For GMDSS the center frequency *is* 1700 Hz.
Shift Freq *	The most commonly used shift frequency is ±85 Hz.
DIRC Center Freq *	The center frequency for FSK is 1700 Hz.
Shift Freq *	A commonly used shift frequency is ±85 Hz.

* May be changed depending on requirements.

Rate (wpm)

Selects the quantity of words transmitted per minute in the FSK mode. The typical rate is 60 wpm. Set the rate according to receiving station.

CW Mod Freq

Selects the CW modulation frequency.

Rate (wpm)

Selects the quantity of words transmitted per minute in the CW mode. (It is not necessary to set the same rate as used on receiving station.)

Line Out Level

The AF out level is adjustable between -30 to + 10 dBm. (-10 to 10 dBm is needed for GMDSS). The factory setting is 0 dBm; however, set the level to match the transceiver used.

Remote A
Remote B

Used to set communication conditions of Remote A and/or Remote B. If no equipment is connected to Remote B, just leave the default settings (**OFF**).
Refer to next page.

Mode
Rate (baud)
Start Bit
Data Bit
Stop Bit
Parity Bit
Delimiter

Select RCVR, XMT, RT or DSC if FURUNO radio equipment is connected. All the other conditions (Rate thru Delimiter) are automatically set.

RCVR: Receiver
XMT: Transmitter
RT: Radiotelephone
DSC: Digital Selective Calling Equipment

Select OFF if a equipment other than FURUNO radio is connected. In this case, if it is controlled by the DP-5 you should set communication conditions (line settings) according to the equipment connected.

MIF Command
Tune

When FURUNO transmitter is connected, the DP-5 send antenna coupler tuning command at ON position.

Freeze

When FURUNO radio equipment is connected, the DP-5 sends freeze command to freeze the panel operation of the equipment connected.

AGC

Set AGC on for radio equipments which AGC command is supported in the MIF format so that the gain is automatically controlled to best condition for telex mode. (Refer to page 10-13.)

CIF/NMEA Mode

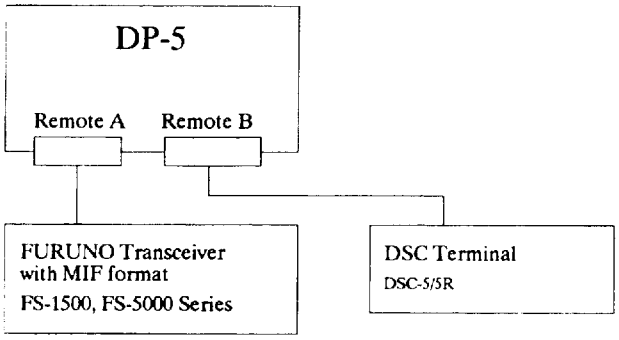
The DP-5 can display ship's L/L position, water temperature, water depth, ship's speed and heading when the DP-5 is connected to a device or interface which can output these data in CIF or NMEA format. This menu selects the format of the navigation device connected.

CIF Rate (baud)

Selects the baud rate of the navigation device connected. The most common baud rate is 4800 bits/second.

Example of interconnection and terminal setting

1



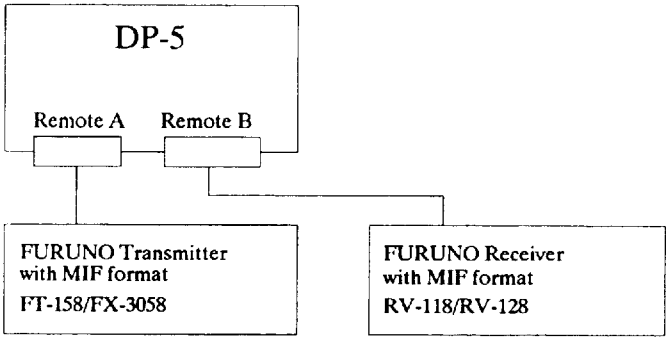
Setting in the "Terminal" menu

Remote A mode OFF RCVR XMT RT DSC

Remote B mode OFF RCVR XMT RT DSC

Rate (baud)
Start Bit
Data Bit
Stop Bit
Parity Bit
Delimiter
} No change

2



Setting in the "Terminal" menu

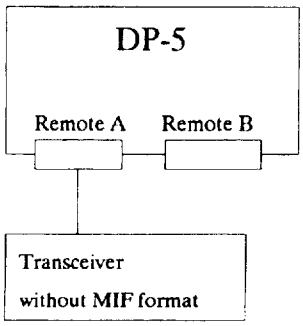
Remote A mode OFF RCVR XMT RT DSC

Remote B mode OFF RCVR XMT RT DSC

Rate (baud)
⋮
Delimiter
} No change

Note: When DP-5 is connected to the rack type radio console, set the remote mode according to the equipments to be actually controlled by DP-5.

3



Setting in the "Terminal" menu

Remote A mode OFF RCVR XMT RT DSC

Remote B mode OFF RCVR XMT RT DSC

Rate (baud)
⋮
Delimiter
} No change

System Settings

Press function key F8 to display the SYSTEM screen.

```
                          System
  Set Up                  Lock Change Default
  -----------------------------------------------------
  Monitor                 OFF   Line In Line Out
     Line In Level        0  1  2  3  4  5  6  7
     Line Out Level       0  1  2  3  4  5  6  7
     Beep Level           0  1  2  3  4  5  6  7
  CRT Economy Mode        OFF ON
  File Partial View       OFF ON
* Slave Delay              5 msec (0-50 msec)
* BK Timing PreTone       10 msec (0-100 msec)
*           PostTone       0 msec (0-20 msec)
* Mute Timing PreBK        0 msec (0-20 msec)
*             PostBK       0 msec (0-20 msec)
  Reception Alarm         OFF ON
  Time System             OFF UTC SMT JST
  Time & Date             1990/ 1/ 1/ 20: 0
* Printer                 PP-500 OTHER
  Header File Name        OFF ON
              Time        OFF ON
  Footer                  OFF ON
* Language                Normal Norway Sweden UK ()\[)
  -----------------------------------------------------
  Self Test
  -----------------------------------------------------
  Version No.             Ver. 2.xx
  Modem Version No.       Ver. 1.10
```

Fig. 10-8 System Screen

Procedure

When the LOCK of the SET UP line is in inverse video, press [↓] key to scroll the display, to refer the items to have been set. If you want to change a setting, press the [→] key to display the CHANGE of the SET UP line in inverse video. (However, items marked with * key can not be changed.) And press the [↓] key to select a desired item, then press the [→] or [←] key to set a desired one. (The DEFAULT of the SET UP line is used only for factory adjustment.)

Menu Description

Set Up — Changes the system settings.

Monitor — Selects sound source for monitoring, line in, line out or monitor off.

Line In Level
Line Out Level — Selects line in/line out sound level for monitor, 0 for OFF, 7 for maximum. (No effect on actual line in and line out levels.)

Beep Level — Sets the volume of the internal monitor buzzer: 0 for OFF, 7 for maximum.

CRT Economy Mode — To extend the life of the CRT it can turn itself off automatically when there is no keyboard operation after 10 minutes.

File Partial View — This menu, when turned on, displays the first line of a file selected. This feature is useful for file search.

Slave Delay * — Sets the length of the slave delay timing in the ARQ mode. Select a time among 0-50 ms.

BK Timing
Pretone * — Sets the timing for the leading edge of the BK signal in the ARQ mode.

Posttone * — Sets the timing for the trailing edge of the BK signal.

Mute Timing
Pre BK * — Sets the timing for the leading edge of the mute signal in the ARQ mode.

Post BK * — Sets the timing for the trailing edge of the mute signal.

* *For further details, see page 10-12.*

Reception Alarm — When ON is selected, an alarm sounds to inform you that a message has been received.

Time System — Selects time display format; UTC, JST (Japan standard time), SMT (ship means time; local time) or no time display.

Time & Date — Sets date and time.

Printer — Selects the type of printer used. For Printer PP-500, select PP-500. For printer PP-505, select "other".

Header File Name Time

Enables or disables header stamping of file name and/or date-time on printing messages.

Footer

Enables or disables page number stamping on printing messages.

Language

Special characters used in Norwegian, Swedish or English are selected according to the list below.

Key No.	①	②	③	Remarks
Normall	[	]	\	
Norway	Æ	Å	ø	Norway, Iceland, Greenland
Sweden	Ä	Å	Ö	Finland, Sweden
UK	@	%	£	UK

Version No.

Shows current program version number of the Control Board.

Modem Version No.

Shows current program version number of the Modem Board.

Self Test

Selects self tests. For further details, see page 9-2.

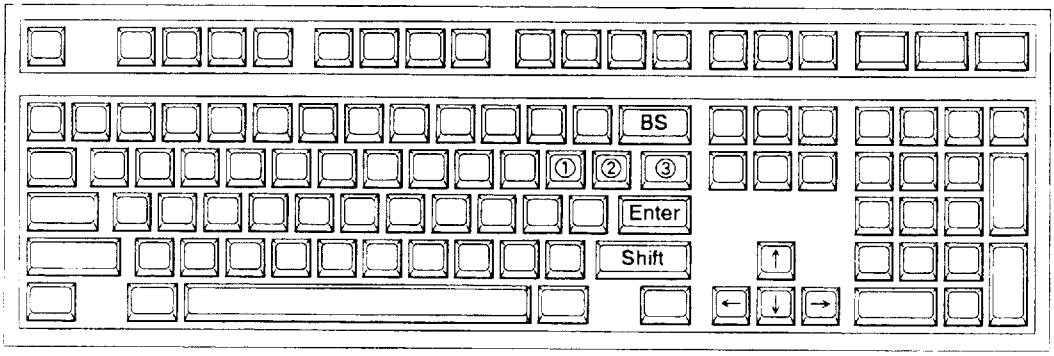
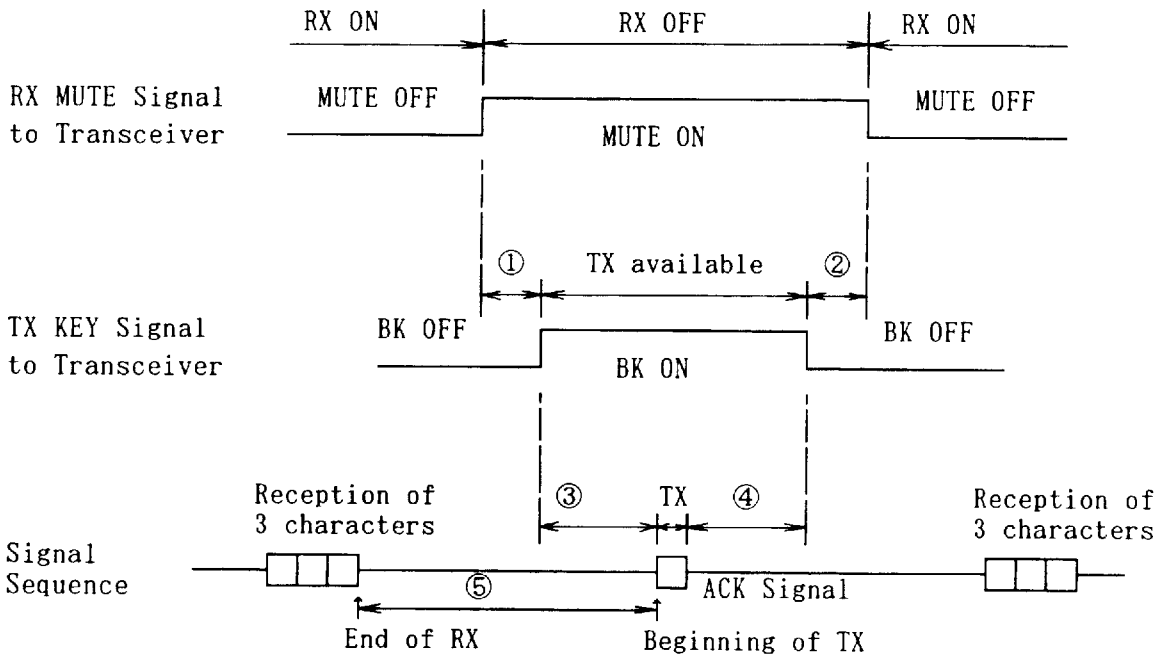


Fig. 10-9 Keys for Special Characters

INFORMATION RECEIVING STATION TIMING



⑤ : SLAVE DELAY
③ : BK TIMING PRE TONE
④ : BK TIMING POST TONE
① : MUTE TIMING PRE BK
② : MUTE TIMING POST BK

Timing values depend on the transceiver connected. Therefore some trial and error may be necessary to find suitable values.
Default values are for FURUNO SSB Radiotelephone model FS-5000.

Fig. 10-10 ARQ Mode Timing of IRS

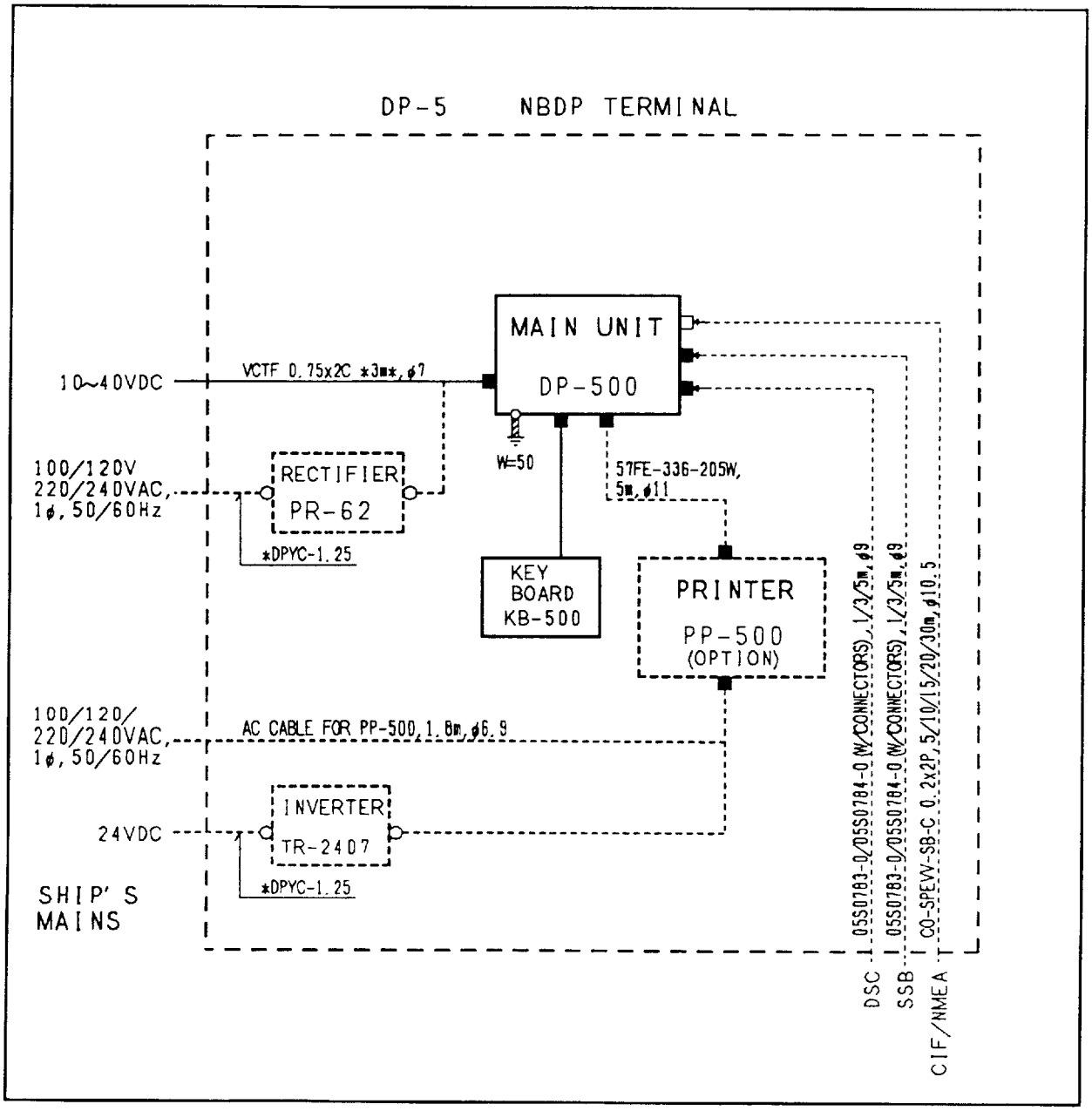
Setting of Timing

Timing (msec)		FS-5000 series FS-8000 series FS-1562	FS-1500 series FS-1502 FS-1552	RC-258 RC-508 RC-808 RC-1208
Slave Delay		5 msec	50	5
BK Timing Pretone		10 msec	50	5
Post Tone		0 msec	10	0
MUTE Timing Pre BK		0 msec	0	0
Post BK		0 msec	0	0
Remarks	DP-5 Terminal Menu MIF AGC	ON (FS-1562 : OFF)	OFF	OFF
	System setting of each equipment	9982 → 1 (FS-5000/8000)	9934 → 1 (FS-1502) 9904 → 0 9905 → 1 (FS-1552) 9906 → 10ms	none

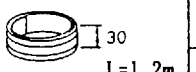
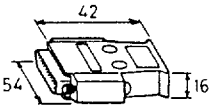
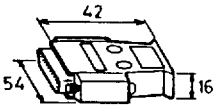
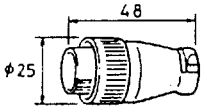
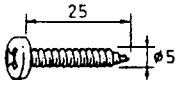
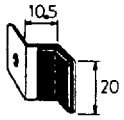
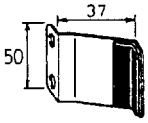
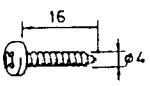
Complete Set

No.	Name	Type	Wt. (kg)	Qty	Remarks
1	Main Unit	DP-500	16	1	
2	Keyboard	KB-500	2	1	
3	Printer	PP-500	5	1	Option
4	Rectifier	PR-62	3	1	Option
5	Inverter	TR-2407	8.5	1	Option
6	Installation Materials			1 set	
7	Accessories			1 set	

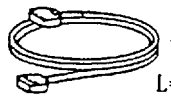
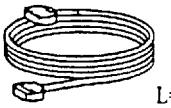
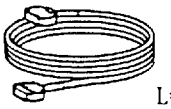
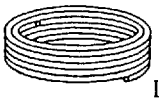
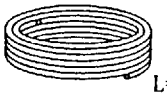
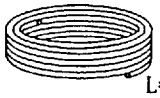
Complete Set Illustration



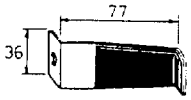
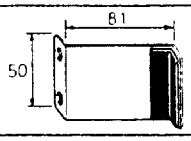
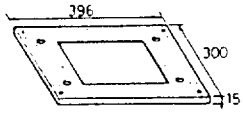
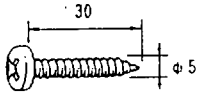
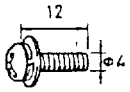
Installation Materials

工事材料表 INSTALLATION MATERIALS		DP-5	狭帯域直接印刷電信装置 NBDP TELEGRAPH EQUIPMENT		
番号 No.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	アース板 COPPER STRAP		05-003-0031-0 CODE No. 590-300-310	1	本体用 FOR DISPLAY UNIT
2	電源ケーブル DC用 POWER CABLE		VCTF0.75×2C *3m* CODE No. 000-112-543	1	本体用 FOR DISPLAY UNIT
3	コネクタ CONNECTOR		17JE-23250-02 (D8C) (オス MALE) CODE No. 000-120-946	2	本体用 FOR DISPLAY UNIT
4	コネクタ CONNECTOR		17JE-13250-02 (D8C) (メス FEMALE) CODE No. 000-119-318	1	本体用 FOR DISPLAY UNIT
5	コネクタ CONNECTOR		SRCN6A16-10P CODE No. 000-508-663	1	本体用 FOR DISPLAY UNIT
6	ミガキ平座金 FLAT WASHER		M5 SUS304 CODE No. 000-864-128	16	本体用 FOR DISPLAY UNIT
7	⊕ナベタッピンネジ TAPPING SCREW		5 ×25 SUS304 1種 CODE No. 000-867-553	16	本体用 FOR DISPLAY UNIT
8	キーボード金具組品1 KEYBOARD FIXTURE 1		CP05-03521 CODE No. 005-927-640	2	キーボード用 FOR KEYBOARD
9	キーボード金具組品2 KEYBOARD FIXTURE 2		CP05-03522 CODE No. 005-927-650	2	キーボード用 FOR KEYBOARD
10	ミガキ平座金 FLAT WASHER		M4 SUS304 CODE No. 000-864-126	6	キーボード用 FOR KEYBOARD
11	⊕ナベタッピンネジ TAPPING SCREW		4 ×16 SUS304 1種 CODE No. 000-867-554	6	キーボード用 FOR KEYBOARD

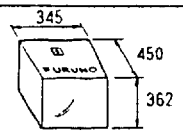
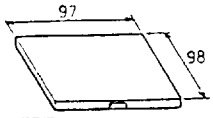
Installation Materials (cont.)

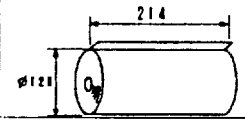
工事材料表 INSTALLATION MATERIALS		NBDPターミナル（オプション） DP-5 NBDP TERMINAL (OPTION)			
番号 No.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	複合１３対ケーブル 13P TWISTED PAIR CABLE	 L=1m	05S0783-0 * 1m * CODE No. 000-123-571	□	何れかを選択 TO BE SELECTED (No. 1—No. 6)
2	複合１３対ケーブル 13P TWISTED PAIR CABLE	 L=3m	05S0783-0 * 3m * CODE No. 000-123-574	□	
3	複合１３対ケーブル 13P TWISTED PAIR CABLE	 L=5m	05S0783-0 * 5m * CODE No. 000-123-581	□	
4	両端コネクター付き13対ケーブル 13P CABLE W/CONNECTORS	 L=1m	05S0784-0 * 1m * CODE No. 000-123-582	□	
5	両端コネクター付き13対ケーブル 13P CABLE W/CONNECTORS	 L=3m	05S0784-0 * 3m * CODE No. 000-123-583	□	
6	両端コネクター付き13対ケーブル 13P CABLE W/CONNECTORS	 L=5m	05S0784-0 * 5m * CODE No. 000-123-584	□	
7	複合２対ケーブル（鎧装付き） 2P TWISTED PAIR CABLE (W/ARMOR)	 L=5m	14S4231 * 5m * CODE No. 000-111-680	□	CIF/NMEA用 FOR CIF/NMEA
8	複合２対ケーブル（鎧装付き） 2P TWISTED PAIR CABLE (W/ARMOR)	 L=10m	14S4231 * 10m * CODE No. 000-120-792	□	何れかを選択 TO BE SELECTED (No. 7—No. 11)
9	複合２対ケーブル（鎧装付き） 2P TWISTED PAIR CABLE (W/ARMOR)	 L=15m	14S4231 * 15m * CODE No. 000-120-793	□	
10	複合２対ケーブル（鎧装付き） 2P TWISTED PAIR CABLE (W/ARMOR)	 L=20m	14S4231 * 20m * CODE No. 000-120-794	□	
11	複合２対ケーブル（鎧装付き） 2P TWISTED PAIR CABLE (W/ARMOR)	 L=30m	14S4231 * 30m * CODE No. 000-120-214	□	

Installation Materials (cont.)

工事材料表 INSTALLATION MATERIALS		PP-500	プリンター PRINTER		
番号 No.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	プリンター押え (1) PRINTER FIXTURE 1		CP05-03610 CODE No. 005-925-550	4	
2	プリンター押え (2) PRINTER FIXTURE 2		CP05-03620 CODE No. 005-925-560	1	
3	プリンター取付台 MOUNTING BED		05-038-0212-0/0213-0 CODE No. 100-122-300	1	
4	ケーブル組品 CABLE ASSY.		57FE-336-205W CODE No. 000-566-966	1	
5	⊕ナベタッピンUIネジ TAPPING SCREW		5 ×30 SUS304 CODE No. 000-802-002	4	
6	ミガキ平座金 FLAT WASHER		M5 SUS304 CODE No. 000-864-128	4	
7	⊕⊖ナベセムスネジB WASHER HEAD SCREW		4 ×12 SUS304 C2700W CODE No. 000-881-447	6	

Accessories

付属品表 ACCESSORIES		DP-5	狭帯域直接印刷電信装置 NBDP TELEGRAPH EQUIPMENT		
番号 No.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ビニールカバー VINYL COVER		14-034-2085-0 CODE No. 000-801-737	1	
2	マイクロフロッピーディスク MICRO FLOPPY DISK		MF-2DDF CODE No. 000-111-708	1	

付属品表 ACCESSORIES		PP-500 プリンター PRINTER			
番号 No.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	プリンタ用紙 RECORDING PAPER		A2 1PLY W CODE No. 000-134-903	1	

FURUNO

ITU TELEX FREQUENCY TABLE (1/4)

4 MHz BAND			6 MHz BAND			8 MHz BAND			12 MHz BAND			16 MHz BAND			18/19 MHz BAND			22 MHz BAND			25/26 MHz BAND		
No.	TX	RX	No.	TX	RX	No.	TX	RX	No.	TX	RX	No.	TX	RX	No.	TX	RX	No.	TX	RX	No.	TX	RX
401	4172.5	4210.5	601	6263.0	6314.5	801	8376.5	8376.5	1201	12477.0	12579.5	1601	16683.5	16807.0	1801	18870.5	19681.0	2201	22284.5	22376.5	2501	25173.0	26101.0
402	4173.0	4211.0	602	6263.5	6315.0	802	8377.0	8417.0	1202	12477.5	12580.0	1602	16684.0	16807.5	1802	18871.0	19681.5	2202	22285.0	22377.0	2502	25173.5	26101.5
403	4173.5	4211.5	603	6264.0	6315.5	803	8377.5	8417.5	1203	12478.0	12580.5	1603	16684.5	16808.0	1803	18871.5	19682.0	2203	22285.5	22377.5	2503	25174.0	26102.0
404	4174.0	4212.0	604	6264.5	6316.0	804	8378.0	8418.0	1204	12478.5	12581.0	1604	16685.0	16808.5	1804	18872.0	19682.5	2204	22286.0	22378.0	2504	25174.5	26102.5
405	4174.5	4212.5	605	6265.0	6316.5	805	8378.5	8418.5	1205	12479.0	12581.5	1605	16685.5	16809.0	1805	18872.5	19683.0	2205	22286.5	22378.5	2505	25175.0	26103.0
406	4175.0	4213.0	606	6265.5	6317.0	806	8379.0	8419.0	1206	12479.5	12582.0	1606	16686.0	16809.5	1806	18873.0	19683.5	2206	22287.0	22379.0	2506	25175.5	26103.5
407	4175.5	4213.5	607	6266.0	6317.5	807	8379.5	8419.5	1207	12480.0	12582.5	1607	16686.5	16810.0	1807	18873.5	19684.0	2207	22287.5	22379.5	2507	25176.0	26104.0
408	4176.0	4214.0	608	6266.5	6318.0	808	8380.0	8420.0	1208	12480.5	12583.0	1608	16687.0	16810.5	1808	18874.0	19684.5	2208	22288.0	22380.0	2508	25176.5	26104.5
409	4176.5	4214.5	609	6267.0	6318.5	809	8380.5	8420.5	1209	12481.0	12583.5	1609	16687.5	16811.0	1809	18874.5	19685.0	2209	22288.5	22380.5	2509	25177.0	26105.0
410	4177.0	4215.0	610	6267.5	6319.0	810	8381.0	8421.0	1210	12481.5	12584.0	1610	16688.0	16811.5	1810	18875.0	19685.5	2210	22289.0	22381.0	2510	25177.5	26105.5
411	4177.5	4177.5	611	6268.0	6268.0	811	8381.5	8421.5	1211	12482.0	12584.5	1611	16688.5	16812.0	1811	18875.5	19686.0	2211	22289.5	22381.5	2511	25178.0	26106.0
412	4178.0	4215.5	612	6268.5	6319.5	812	8382.0	8422.0	1212	12482.5	12585.0	1612	16689.0	16812.5	1812	18876.0	19686.5	2212	22290.0	22382.0	2512	25178.5	26106.5
413	4178.5	4216.0	613	6269.0	6320.0	813	8382.5	8422.5	1213	12483.0	12585.5	1613	16689.5	16813.0	1813	18876.5	19687.0	2213	22290.5	22382.5	2513	25179.0	26107.0
414	4179.0	4216.5	614	6269.5	6320.5	814	8383.0	8423.0	1214	12483.5	12586.0	1614	16690.0	16813.5	1814	18877.0	19687.5	2214	22291.0	22383.0	2514	25179.5	26107.5
415	4179.5	4217.0	615	6270.0	6321.0	815	8383.5	8423.5	1215	12484.0	12586.5	1615	16690.5	16814.0	1815	18877.5	19688.0	2215	22291.5	22383.5	2515	25180.0	26108.0
416	4180.0	4217.5	616	6270.5	6321.5	816	8384.0	8424.0	1216	12484.5	12587.0	1616	16691.0	16814.5	1816	18878.0	19688.5	2216	22292.0	22384.0	2516	25180.5	26108.5
417	4180.5	4218.0	617	6271.0	6322.0	817	8384.5	8424.5	1217	12485.0	12587.5	1617	16691.5	16815.0	1817	18878.5	19689.0	2217	22292.5	22384.5	2517	25181.0	26109.0
418	4181.0	4218.5	618	6271.5	6322.5	818	8385.0	8425.0	1218	12485.5	12588.0	1618	16692.0	16815.5	1818	18879.0	19689.5	2218	22293.0	22385.0	2518	25181.5	26109.5
419	4181.5	4219.0	619	6272.0	6323.0	819	8385.5	8425.5	1219	12486.0	12588.5	1619	16692.5	16816.0	1819	18879.5	19690.0	2219	22293.5	22385.5	2519	25182.0	26110.0
420	4202.5	4202.5	620	6272.5	6323.5	820	8386.0	8426.0	1220	12486.5	12589.0	1620	16693.0	16816.5	1820	18880.0	19690.5	2220	22294.0	22386.0	2520	25182.5	26110.5
421	4203.0	4203.0	621	6273.0	6324.0	821	8386.5	8426.5	1221	12487.0	12589.5	1621	16693.5	16817.0	1821	18880.5	19691.0	2221	22294.5	22386.5	2521	25183.0	26111.0
422	4203.5	4203.5	622	6273.5	6324.5	822	8387.0	8427.0	1222	12487.5	12590.0	1622	16694.0	16817.5	1822	18881.0	19691.5	2222	22295.0	22387.0	2522	25183.5	26111.5
423	4204.0	4204.0	623	6274.0	6325.0	823	8387.5	8427.5	1223	12488.0	12590.5	1623	16694.5	16818.0	1823	18881.5	19692.0	2223	22295.5	22387.5	2523	25184.0	26112.0
424	4204.5	4204.5	624	6274.5	6325.5	824	8388.0	8428.0	1224	12488.5	12591.0	1624	16695.0	16695.0	1824	18882.0	19692.5	2224	22296.0	22388.0	2524	25184.5	26112.5
425	4205.0	4205.0	625	6275.0	6326.0	825	8388.5	8428.5	1225	12489.0	12591.5	1625	16695.5	16818.5	1825	18882.5	19693.0	2225	22296.5	22388.5	2525	25185.0	26113.0
426	4205.5	4205.5	626	6275.5	6326.5	826	8389.0	8429.0	1226	12489.5	12592.0	1626	16696.0	16819.0	1826	18883.0	19693.5	2226	22297.0	22389.0	2526	25185.5	26113.5
427	4206.0	4206.0	627	6281.0	6327.0	827	8389.5	8429.5	1227	12490.0	12592.5	1627	16696.5	16819.5	1827	18883.5	19694.0	2227	22297.5	22389.5	2527	25186.0	26114.0
428	4206.5	4206.5	628	6281.5	6327.5	828	8390.0	8430.0	1228	12490.5	12593.0	1628	16697.0	16820.0	1828	18884.0	19694.5	2228	22298.0	22390.0	2528	25186.5	26114.5
429	4207.0	4207.0	629	6282.0	6328.0	829	8390.5	8430.5	1229	12491.0	12593.5	1629	16697.5	16820.5	1829	18884.5	19695.0	2229	22298.5	22390.5	2529	25187.0	26115.0
430	4207.5	4207.5	630	6282.5	6328.5	830	8391.0	8431.0	1230	12491.5	12594.0	1630	16698.0	16821.0	1830	18885.0	19695.5	2230	22299.0	22391.0	2530	25187.5	26115.5
431	4208.0	4219.5	631	6283.0	6329.0	831	8391.5	8431.5	1231	12492.0	12594.5	1631	16698.5	16821.5	1831	18885.5	19696.0	2231	22299.5	22391.5	2531	25188.0	26116.0
432	4208.5	4220.0	632	6283.5	6329.5	832	8392.0	8432.0	1232	12492.5	12595.0	1632	16699.0	16822.0	1832	18886.0	19696.5	2232	22300.0	22392.0	2532	25188.5	26116.5
433	4209.0	4220.5	633	6284.0	6330.0	833	8392.5	8432.5	1233	12493.0	12595.5	1633	16699.5	16822.5	1833	18886.5	19697.0	2233	22300.5	22392.5	2533	25189.0	26117.0
			634	6284.5	6330.5	834	8393.0	8433.0	1234	12493.5	12596.0	1634	16700.0	16823.0	1834	18887.0	19697.5	2234	22301.0	22393.0	2534	25189.5	26117.5
			635	6300.5	6300.5	835	8393.5	8433.5	1235	12494.0	12596.5	1635	16700.5	16823.5	1835	18887.5	19698.0	2235	22301.5	22393.5	2535	25190.0	26118.0
			636	6301.0	6301.0	836	8394.0	8434.0	1236	12494.5	12597.0	1636	16701.0	16824.0	1836	18888.0	19698.5	2236	22302.0	22394.0	2536	25190.5	26118.5
			637	6301.5	6301.5	837	8394.5	8434.5	1237	12495.0	12597.5	1637	16701.5	16824.5	1837	18888.5	19699.0	2237	22302.5	22394.5	2537	25191.0	26119.0
			638	6302.0	6302.0	838	8395.0	8435.0	1238	12495.5	12598.0	1638	16702.0	16825.0	1838	18889.0	19699.5	2238	22303.0	22395.0	2538	25191.5	26119.5
			639	6302.5	6302.5	839	8395.5	8435.5	1239	12496.0	12598.5	1639	16702.5	16825.5	1839	18889.5	19700.0	2239	22303.5	22395.5	2539	25192.0	26120.0
			640	6303.0	6303.0	840	8396.0	8436.0	1240	12496.5	12599.0	1640	16703.0	16826.0	1840	18890.0	19700.5	2240	22304.0	22396.0	2540	25192.5	26120.5
			641	6303.5	6303.5	841	8396.5	8396.5	1241	12497.0	12599.5	1641	16703.5	16826.5	1841	18890.5	19701.0	2241	22304.5	22396.5	2541	25193.0	25193.0
			642	6304.0	6304.0	842	8397.0	8397.0	1242	12497.5	12600.0	1642	16704.0	16827.0	1842	18891.0	19701.5	2242	22305.0	22397.0	2542	25193.5	25193.5
			643	6304.5	6304.5	843	8397.5	8397.5	1243	12498.0	12600.5	1643	16704.5	16827.5	1843	18891.5	19702.0	2243	22305.5	22397.5	2543	25194.0	25194.0
			644	6305.0	6305.0	844	8398.0	8398.0	1244	12498.5	12601.0	1644	16705.0	16828.0	1844	18892.0	19702.5	2244	22306.0	22398.0	2544	25194.5	25194.5
			645	6305.5	6305.5	845	8398.5	8398.5	1245	12499.0	12601.5	1645	16705.5	16828.5	1845	18892.5	19703.0	2245	22306.5	22398.5	2545	25195.0	25195.0
			646	6306.0	6306.0	846	8399.0	8399.0	1246	12499.5	12602.0	1646	16706.0	16829.0	1846	18893.0	18893.0	2246	22307.0	22399.0	2546	25195.5	25195.5
			647	6306.5	6306.5	847	8399.5	8399.5	1247	12500.0	12602.5	1647	16706.5	16829.5	1847	18893.5	18893.5	2247	22307.5	22399.5	2547	25196.0	25196.0
			648	6307.0	6307.0	848	8400.0	8400.0	1248	12500.5	12603.0	1648	16707.0	16830.0	1848	18894.0	18894.0	2248	22308.0	22400.0	2548	25196.5	25196.5
			649	6307.5	6307.5	849	8400.5	8400.5	1249	12501.0	12603.5	1649	16707.5	16830.5	1849	18894.5	18894.5	2249	22308.5	22400.5	2549	25197.0	25197.0
			650	6308.0	6308.0	850	8401.0	8401.0	1250	12501.5	12604.0	1650	16708.0	16831.0	1850	18895.0	18895.0	2250	22309.0	22401.0	2550	25197.5	25197.5
			651	6308.5	6308.5	851	8401.5	8401.5	1251	12502.0	12604.5	1651	16708.5	16831.5	1851	18895.5	18895.5	2251	22309.5	22401.5	2551	25198.0	25198.0
			652	6309.0	6309.0	852	8402.0	8402.0	1252	12502.5	12605.0	1652	16709.0	16832.0	1852	18896.0	18896.0	2252	22310.0	22402.0	2552	25198.5	25198.5
			653	6309.5	6309.5	853	8402.5	8402.5	1253	12503.0	12605.5	1653	16709.5	16832.5	1853	18896.5	18896.5	2253	22310.5	22402.5	2553	25199.0	25199.0
			654	6310.0	6310.0	854	8403.0	8403.0	1254	12503.5	12606.0	1654	16710.0	16833.0	1854	18897.0	18897.0	2254	22311.0	22403.0	2554	25199.5	25199.5
			655	6310.5	6310.5	855	8403.5	8403.5	1255	12504.0	12606.5	1655	16710.5	16833.5	1855	18897.5	18897.5	2255	22311.5	22403.5	2555	25200.0	25200.0
			656	6311.0	6311.0	856	8404.0	8404.0	1256	12504.5	12607.0	1656	16711.0	16834.0	1856	18898.0	18898.0	2256	22312.0	22404.0	2556	25200.5	25200.5
			657	6311.5	6311.5	857	8404.5	8404.5	1257	12505.0	12607.5	1657	16711.5	16834.5	1857	18898.5	19703.5	2257	22312.5	22404.5	2557	25201.0	25201.0
			658	6312.0	6312.0	858	8405.0	8405.0	1258	12505.5	12608.0	1658	16712.0	16835.0	1858	18899.0	19704.0	2258	22313.0	22405.0	2558	25201.5	25201.5
			659	6312.5	6331.0	859	8405.5	8405.5	1259	12506.0	12608.5	1659	16712.5	16835.5	1859	18899.5	19704.5	2259	22313.5	22405.5	2559	25202.0	25202.0
			660	6313.0	6331.5	860	8406.0	8406.0	1260	12506.5	12609.0	1660	16713.0	16836.0				2260	22314.0	22406.0	2560	25202.5	25202.5
			661	6313.5	6332.0	861	8406.5	8406.5	1261	12507.0	12609.5	1661	16713.5	16836.5				2261	22314.5	22406.5	2561	25203.0	25203.0
						862	8407.0	8407.0	1262	12507.5	12610.0	1662	16714.0	16837.0				2262	22315.0	22407.0	2562	25203.5	25203.5
						863	8407.5	8407.5	1263	12508.0	12610.5	1663	16714.5	16837.5				2263	22315.5	22407.5	2563	25204.0	25204.0
						864	8408.0	8408.0	1264	12508.5	12611.0	1664	16715.0	16838.0				2264	22316.0	22408.0	2564	25204.5	25204.5
						865	8408.5	8408.5	1265	12509.0	12611.5	1665	16715.5	16838.5				2265	22316.5	22408.5	2565	25205.0	25205.0

FURUNO

ITU TELEX FREQUENCY TABLE (2/4)

4 MHz BAND			6 MHz BAND			8 MHz BAND			12 MHz BAND			16 MHz BAND			18/19 MHz BAND			22 MHz BAND			25/26 MHz BAND		
No.	TX	RX	No.	TX	RX	No.	TX	RX	No.	TX	RX	No.	TX	RX	No.	TX	RX	No.	TX	RX	No.	TX	RX
						866	8409.0	8409.0	1266	12509.5	12612.0	1666	16716.0	16839.0				2266	22317.0	22409.0	2566	25205.5	25205.5
						867	8409.5	8409.5	1267	12510.0	12612.5	1667	16716.5	16839.5				2267	22317.5	22409.5	2567	25206.0	25206.0
						868	8410.0	8410.0	1268	12510.5	12613.0	1668	16717.0	16840.0				2268	22318.0	22410.0	2568	25206.5	25206.5
						869	8410.5	8410.5	1269	12511.0	12613.5	1669	16717.5	16840.5				2269	22318.5	22410.5	2569	25207.0	25207.0
						870	8411.0	8411.0	1270	12511.5	12614.0	1670	16718.0	16841.0				2270	22319.0	22411.0	2570	25207.5	25207.5
						871	8411.5	8411.5	1271	12512.0	12614.5	1671	16718.5	16841.5				2271	22319.5	22411.5	2571	25208.0	25208.0
						872	8412.0	8412.0	1272	12512.5	12615.0	1672	16719.0	16842.0				2272	22320.0	22412.0	2572	25208.5	26121.0
						873	8412.5	8412.5	1273	12513.0	12615.5	1673	16719.5	16842.5				2273	22320.5	22412.5	2573	25209.0	26121.5
						874	8413.0	8413.0	1274	12513.5	12616.0	1674	16720.0	16843.0				2274	22321.0	22413.0	2574	25209.5	26122.0
						875	8413.5	8413.5	1275	12514.0	12616.5	1675	16720.5	16843.5				2275	22321.5	22413.5			
						876	8414.0	8414.0	1276	12514.5	12617.0	1676	16721.0	16844.0				2276	22322.0	22414.0			
						877	8414.5	8414.5	1277	12515.0	12617.5	1677	16721.5	16844.5				2277	22322.5	22414.5			
						878	8415.0	8436.5	1278	12515.5	12618.0	1678	16722.0	16845.0				2278	22323.0	22415.0			
						879	8415.5	8437.0	1279	12516.0	12618.5	1679	16722.5	16845.5				2279	22323.5	22415.5			
						880	8416.0	8437.5	1280	12516.5	12619.0	1680	16723.0	16846.0				2280	22324.0	22416.0			
									1281	12517.0	12619.5	1681	16723.5	16846.5				2281	22324.5	22416.5			
									1282	12517.5	12620.0	1682	16724.0	16847.0				2282	22325.0	22417.0			
									1283	12518.0	12620.5	1683	16724.5	16847.5				2283	22325.5	22417.5			
									1284	12518.5	12621.0	1684	16725.0	16848.0				2284	22326.0	22418.0			
									1285	12519.0	12621.5	1685	16725.5	16848.5				2285	22326.5	22418.5			
									1286	12519.5	12622.0	1686	16726.0	16849.0				2286	22327.0	22419.0			
									1287	12520.0	12520.0	1687	16726.5	16849.5				2287	22327.5	22419.5			
									1288	12520.5	12622.5	1688	16727.0	16850.0				2288	22328.0	22420.0			
									1289	12521.0	12623.0	1689	16727.5	16850.5				2289	22328.5	22420.5			
									1290	12521.5	12623.5	1690	16728.0	16851.0				2290	22329.0	22421.0			
									1291	12522.0	12624.0	1691	16728.5	16851.5				2291	22329.5	22421.5			
									1292	12522.5	12624.5	1692	16729.0	16852.0				2292	22330.0	22422.0			
									1293	12523.0	12625.0	1693	16729.5	16852.5				2293	22330.5	22422.5			
									1294	12523.5	12625.5	1694	16730.0	16853.0				2294	22331.0	22423.0			
									1295	12524.0	12626.0	1695	16730.5	16853.5				2295	22331.5	22423.5			
									1296	12524.5	12626.5	1696	16731.0	16854.0				2296	22332.0	22424.0			
									1297	12525.0	12627.0	1697	16731.5	16854.5				2297	22332.5	22424.5			
									1298	12525.5	12627.5	1698	16732.0	16855.0				2298	22333.0	22425.0			
									1299	12526.0	12628.0	1699	16732.5	16855.5				2299	22333.5	22425.5			
									12100	12526.5	12628.5	16100	16733.0	16856.0				22100	22334.0	22426.0			
									12101	12527.0	12629.0	16101	16733.5	16856.5				22101	22334.5	22426.5			
									12102	12527.5	12629.5	16102	16739.0	16857.0				22102	22335.0	22427.0			
									12103	12528.0	12630.0	16103	16739.5	16857.5				22103	22335.5	22427.5			
									12104	12528.5	12630.5	16104	16740.0	16858.0				22104	22336.0	22428.0			
									12105	12529.0	12631.0	16105	16740.5	16858.5				22105	22336.5	22428.5			
									12106	12529.5	12631.5	16106	16741.0	16859.0				22106	22337.0	22429.0			
									12107	12530.0	12632.0	16107	16741.5	16859.5				22107	22337.5	22429.5			
									12108	12530.5	12632.5	16108	16742.0	16860.0				22108	22338.0	22430.0			
									12109	12531.0	12633.0	16109	16742.5	16860.5				22109	22338.5	22430.5			
									12110	12531.5	12633.5	16110	16743.0	16861.0				22110	22339.0	22431.0			
									12111	12532.0	12634.0	16111	16743.5	16861.5				22111	22339.5	22431.5			
									12112	12532.5	12634.5	16112	16744.0	16862.0				22112	22340.0	22432.0			
									12113	12533.0	12635.0	16113	16744.5	16862.5				22113	22340.5	22432.5			
									12114	12533.5	12635.5	16114	16745.0	16863.0				22114	22341.0	22433.0			
									12115	12534.0	12636.0	16115	16745.5	16863.5				22115	22341.5	22433.5			
									12116	12534.5	12636.5	16116	16746.0	16864.0				22116	22342.0	22434.0			
									12117	12535.0	12637.0	16117	16746.5	16864.5				22117	22342.5	22434.5			
									12118	12535.5	12637.5	16118	16747.0	16865.0				22118	22343.0	22435.0			
									12119	12536.0	12638.0	16119	16747.5	16865.5				22119	22343.5	22435.5			
									12120	12536.5	12638.5	16120	16748.0	16866.0				22120	22344.0	22436.0			
									12121	12537.0	12639.0	16121	16748.5	16866.5				22121	22344.5	22436.5			
									12122	12537.5	12639.5	16122	16749.0	16867.0				22122	22345.0	22437.0			
									12123	12538.0	12640.0	16123	16749.5	16867.5				22123	22345.5	22437.5			
									12124	12538.5	12640.5	16124	16750.0	16868.0				22124	22346.0	22438.0			
									12125	12539.0	12641.0	16125	16750.5	16868.5				22125	22346.5	22438.5			
									12126	12539.5	12641.5	16126	16751.0	16869.0				22126	22347.0	22439.0			
									12127	12540.0	12642.0	16127	16751.5	16869.5				22127	22347.5	22439.5			
									12128	12540.5	12642.5	16128	16752.0	16870.0				22128	22348.0	22440.0			
									12129	12541.0	12643.0	16129	16752.5	16870.5				22129	22348.5	22440.5			
									12130	12541.5	12643.5	16130	16753.0	16871.0				22130	22349.0	22441.0			

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ITU TELEX FREQUENCY TABLE (3/4)

4 MHz BAND			6 MHz BAND			8 MHz BAND			12 MHz BAND			16 MHz BAND			18/19 MHz BAND			22 MHz BAND			25/26 MHz BAND		
No.	TX	RX	No.	TX	RX	No.	TX	RX	No.	TX	RX	No.	TX	RX	No.	TX	RX	No.	TX	RX	No.	TX	RX
									12131	12542.0	12644.0	16131	16753.5	16871.5				22131	22349.5	22441.5			
									12132	12542.5	12644.5	16132	16754.0	16872.0				22132	22350.0	22442.0			
									12133	12543.0	12645.0	16133	16754.5	16872.5				22133	22350.5	22442.5			
									12134	12543.5	12645.5	16134	16755.0	16873.0				22134	22351.0	22443.0			
									12135	12544.0	12646.0	16135	16755.5	16873.5				22135	22351.5	22443.5			
									12136	12544.5	12646.5	16136	16756.0	16874.0				22136	22352.0	22352.0			
									12137	12545.0	12647.0	16137	16756.5	16874.5				22137	22352.5	22352.5			
									12138	12545.5	12647.5	16138	16757.0	16875.0				22138	22353.0	22353.0			
									12139	12546.0	12648.0	16139	16757.5	16875.5				22139	22353.5	22353.5			
									12140	12546.5	12648.5	16140	16758.0	16876.0				22140	22354.0	22354.0			
									12141	12547.0	12649.0	16141	16758.5	16876.5				22141	22354.5	22354.5			
									12142	12547.5	12649.5	16142	16759.0	16877.0				22142	22355.0	22355.0			
									12143	12548.0	12650.0	16143	16759.5	16877.5				22143	22355.5	22355.5			
									12144	12548.5	12650.5	16144	16760.0	16878.0				22144	22356.0	22356.0			
									12145	12549.0	12651.0	16145	16760.5	16878.5				22145	22356.5	22356.5			
									12146	12549.5	12651.5	16146	16761.0	16879.0				22146	22357.0	22357.0			
									12147	12555.0	12652.0	16147	16761.5	16879.5				22147	22357.5	22357.5			
									12148	12555.5	12652.5	16148	16762.0	16880.0				22148	22358.0	22358.0			
									12149	12556.0	12653.0	16149	16762.5	16880.5				22149	22358.5	22358.5			
									12150	12556.5	12653.5	16150	16763.0	16881.0				22150	22359.0	22359.0			
									12151	12557.0	12654.0	16151	16763.5	16881.5				22151	22359.5	22359.5			
									12152	12557.5	12654.5	16152	16764.0	16882.0				22152	22360.0	22360.0			
									12153	12558.0	12655.0	16153	16764.5	16882.5				22153	22360.5	22360.5			
									12154	12558.5	12655.5	16154	16765.0	16883.0				22154	22361.0	22361.0			
									12155	12559.0	12656.0	16155	16765.5	16883.5				22155	22361.5	22361.5			
									12156	12559.5	12656.5	16156	16766.0	16884.0				22156	22362.0	22362.0			
									12157	12560.0	12560.0	16157	16766.5	16884.5				22157	22362.5	22362.5			
									12158	12560.5	12560.5	16158	16767.0	16885.0				22158	22363.0	22363.0			
									12159	12561.0	12561.0	16159	16767.5	16885.5				22159	22363.5	22363.5			
									12160	12561.5	12561.5	16160	16768.0	16886.0				22160	22364.0	22364.0			
									12161	12562.0	12562.0	16161	16768.5	16886.5				22161	22364.5	22364.5			
									12162	12562.5	12562.5	16162	16769.0	16887.0				22162	22365.0	22365.0			
									12163	12563.0	12563.0	16163	16769.5	16887.5				22163	22365.5	22365.5			
									12164	12563.5	12563.5	16164	16770.0	16888.0				22164	22366.0	22366.0			
									12165	12564.0	12564.0	16165	16770.5	16888.5				22165	22366.5	22366.5			
									12166	12564.5	12564.5	16166	16771.0	16889.0				22166	22367.0	22367.0			
									12167	12565.0	12565.0	16167	16771.5	16889.5				22167	22367.5	22367.5			
									12168	12565.5	12565.5	16168	16772.0	16890.0				22168	22368.0	22368.0			
									12169	12566.0	12566.0	16169	16772.5	16890.5				22169	22368.5	22368.5			
									12170	12566.5	12566.5	16170	16773.0	16891.0				22170	22369.0	22369.0			
									12171	12567.0	12567.0	16171	16773.5	16891.5				22171	22369.5	22369.5			
									12172	12567.5	12567.5	16172	16774.0	16892.0				22172	22370.0	22370.0			
									12173	12568.0	12568.0	16173	16774.5	16892.5				22173	22370.5	22370.5			
									12174	12568.5	12568.5	16174	16775.0	16893.0				22174	22371.0	22371.0			
									12175	12569.0	12569.0	16175	16775.5	16893.5				22175	22371.5	22371.5			
									12176	12569.5	12569.5	16176	16776.0	16894.0				22176	22372.0	22372.0			
									12177	12570.0	12570.0	16177	16776.5	16894.5				22177	22372.5	22372.5			
									12178	12570.5	12570.5	16178	16777.0	16895.0				22178	22373.0	22373.0			
									12179	12571.0	12571.0	16179	16777.5	16895.5				22179	22373.5	22373.5			
									12180	12571.5	12571.5	16180	16778.0	16896.0				22180	22374.0	22374.0			
									12181	12572.0	12572.0	16181	16778.5	16896.5				22181	22374.5	22444.0			
									12182	12572.5	12572.5	16182	16779.0	16897.0				22182	22375.0	22444.5			
									12183	12573.0	12573.0	16183	16779.5	16897.5				22183	22375.5	22445.0			
									12184	12573.5	12573.5	16184	16780.0	16898.0									
									12185	12574.0	12574.0	16185	16780.5	16898.5									
									12186	12574.5	12574.5	16186	16781.0	16899.0									
									12187	12575.0	12575.0	16187	16781.5	16899.5									
									12188	12575.5	12575.5	16188	16782.0	16900.0									
									12189	12576.0	12576.0	16189	16782.5	16900.5									
									12190	12576.5	12576.5	16190	16783.0	16901.0									
									12191	12577.0	12577.0	16191	16783.5	16901.5									
									12192	12577.5	12657.0	16192	16784.0	16902.0									
									12193	12578.0	12657.5	16193	16784.5	16902.5									
									12194	12578.5	12658.0	16194	16785.0	16785.0									
												16195	16785.5	16785.5									

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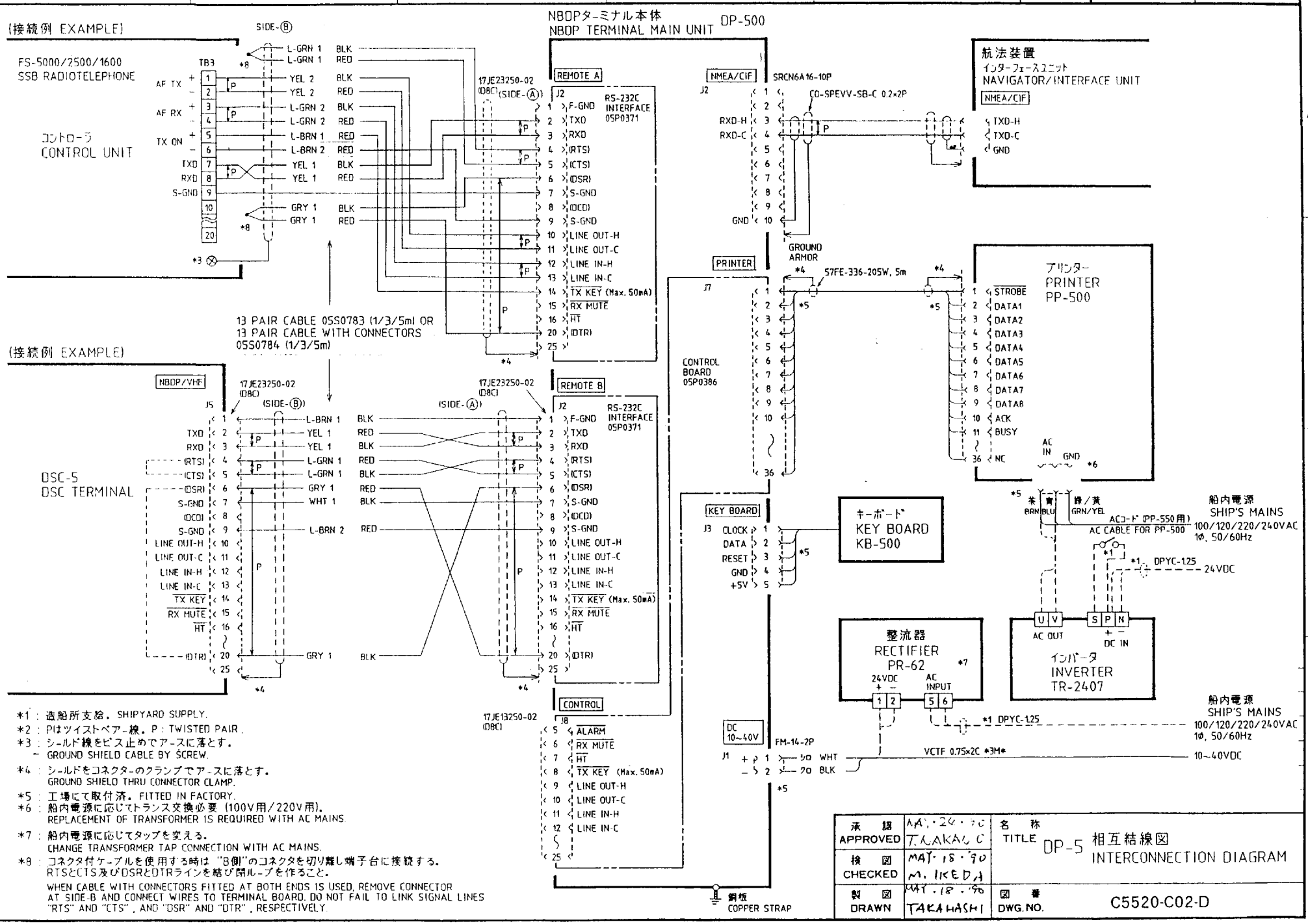
ITU TELEX FREQUENCY TABLE (4/4)

4 MHz BAND			6 MHz BAND			8 MHz BAND			12 MHz BAND			16 MHz BAND			18/19 MHz BAND			22 MHz BAND			25/26 MHz BAND		
No.	TX	RX	No.	TX	RX	No.	TX	RX	No.	TX	RX	No.	TX	RX	No.	TX	RX	No.	TX	RX	No.	TX	RX
												16196	16786.0	16786.0									
												16197	16786.5	16786.5									
												16198	16787.0	16787.0									
												16199	16787.5	16787.5									
												16200	16788.0	16788.0									
												16201	16788.5	16788.5									
												16202	16789.0	16789.0									
												16203	16789.5	16789.5									
												16204	16790.0	16790.0									
												16205	16790.5	16790.5									
												16206	16791.0	16791.0									
												16207	16791.5	16791.5									
												16208	16792.0	16792.0									
												16209	16792.5	16792.5									
												16210	16793.0	16793.0									
												16211	16793.5	16793.5									
												16212	16794.0	16794.0									
												16213	16794.5	16794.5									
												16214	16795.0	16795.0									
												16215	16795.5	16795.5									
												16216	16796.0	16796.0									
												16217	16796.5	16796.5									
												16218	16797.0	16797.0									
												16219	16797.5	16797.5									
												16220	16798.0	16798.0									
												16221	16798.5	16798.5									
												16222	16799.0	16799.0									
												16223	16799.5	16799.5									
												16224	16800.0	16800.0									
												16225	16800.5	16800.5									
												16226	16801.0	16801.0									
												16227	16801.5	16801.5									
												16228	16802.0	16802.0									
												16229	16802.5	16802.5									
												16230	16803.0	16803.0									
												16231	16803.5	16803.5									
												16232	16804.0	16804.0									
												16233	16804.5	16804.5									
												16234	16805.0	16903.0									
												16235	16805.5	16903.5									
												16236	16806.0	16904.0									

APPENDIX 2 INTERNATIONAL TELEX ABBREVIATIONS

Abbreviation	Meaning
ADV	Advise
ACK	Acknowledge
AGN	Again
BI (GS)	Good bye
BK	I cut off.
CFM	Confirm
COL	Collation
CRV	How do you receive?
DER	Out of order
DWN	Down
EEE	Error
FM	From
GA	Go ahead.
MNS	Minutes
MOM	Wait (Waiting)
MUTI	Mutilated
NA	Correspondence to this subscriber is not admitted.
NC	No circuits
NCH	Subscriber's number has been changed.
NP	The called party is not or no longer is a subscriber.
NR	Indicate your call number.
OCC	Subscriber is engaged.
OK	Agreed.
P (or 0)	Stop your transmission.
PLS (PSE)	Please
PPR	Paper
R (RCD)	Received
RAP	I will call you again.
RD	Read
RE	Referrring to
RPT	Repeat
SRY	Sorry
SVP	Please
TAX	What is the charge?
TEST MSG	Please send a test message?
THRU	You are in communication with telex position
TKS (TNX)	Thanks
TLX	Telex



*1 : 造船所支給。SHIPYARD SUPPLY.
*2 : Pはツイストペア-線。P : TWISTED PAIR.
*3 : シールド線をビス止めでアースに落とす。
– GROUND SHIELD CABLE BY SCREW.
*4 : シールドをコネクターのクランプでアースに落とす。
GROUND SHIELD THRU CONNECTOR CLAMP.
*5 : 工場にて取付済。FITTED IN FACTORY.
*6 : 船内電源に応じてトランス交換必要 (100V用/220V用)。
REPLACEMENT OF TRANSFORMER IS REQUIRED WITH AC MAINS.
*7 : 船内電源に応じてタップを変える。
CHANGE TRANSFORMER TAP CONNECTION WITH AC MAINS.
*8 : コネクタ付ケーブルを使用する時は "B側"のコネクタを切り離し端子台に接続する。
RTSとCTS及びDSRとDTRラインを結び閉ループを作ること。
WHEN CABLE WITH CONNECTORS FITTED AT BOTH ENDS IS USED, REMOVE CONNECTOR AT SIDE-B AND CONNECT WIRES TO TERMINAL BOARD. DO NOT FAIL TO LINK SIGNAL LINES "RTS" AND "CTS", AND "DSR" AND "DTR", RESPECTIVELY.

承認 APPROVED	MAY.24.'90	名称 TITLE	DP-5 相互結線図 INTERCONNECTION DIAGRAM
検図 CHECKED	MAY.18.'90 M.IKEDA		
製図 DRAWN	MAY.18.'90 TAKAHASHI	図番 DWG.NO.	C5520-C02-D

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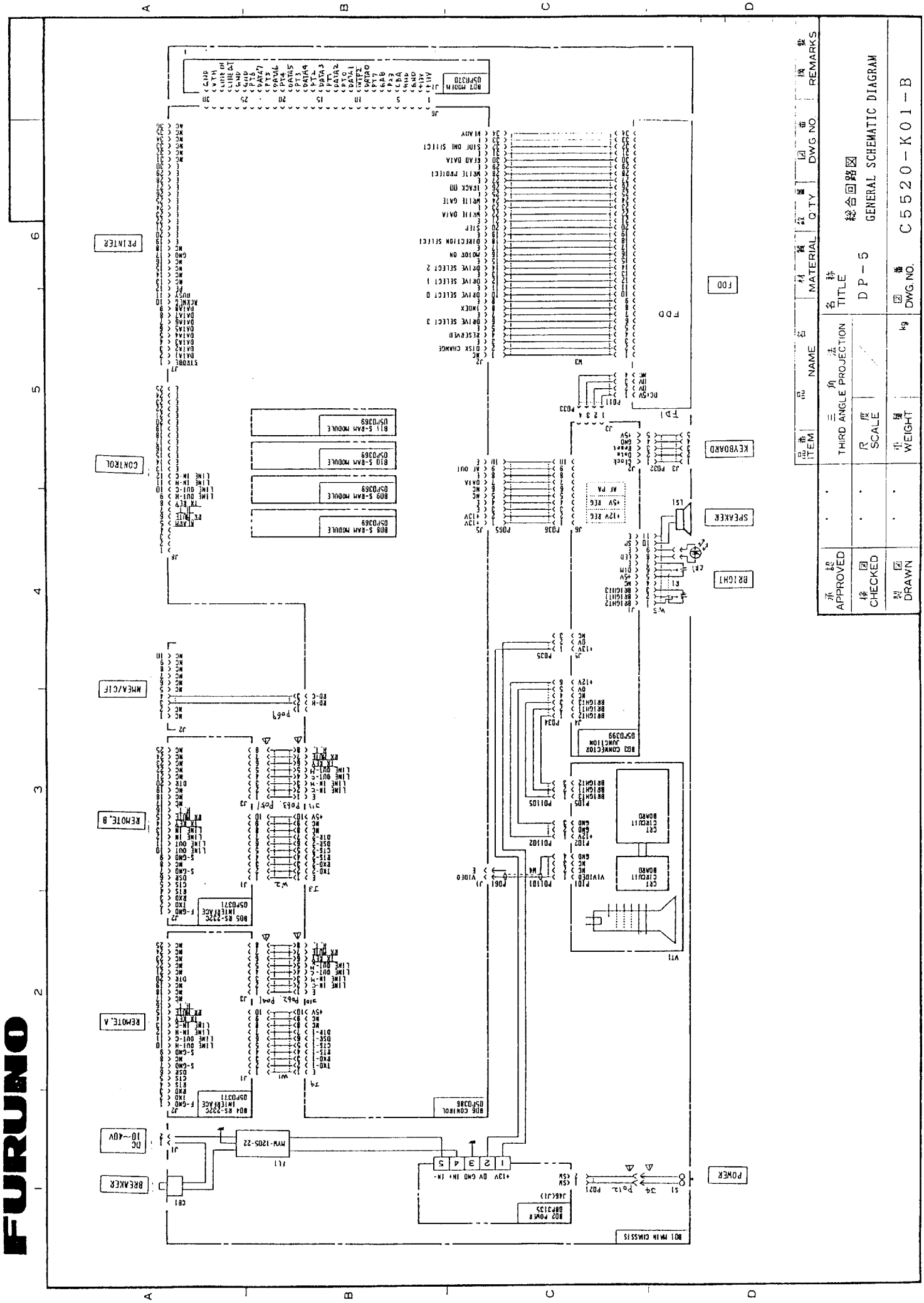
S-1-1



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

THIRD ANGLE PROJECTION	TITLE	DWG NO.	
投影法	名称	図番	
	DP－5 総合回路図	C5520－K01－B	
SCALE			
尺度			
WEIGHT	GENERAL SCHEMATIC DIAGRAM		
重量			
kg			

APPROVED		
承認		
CHECKED		
検図		
DRAWN		
製図		

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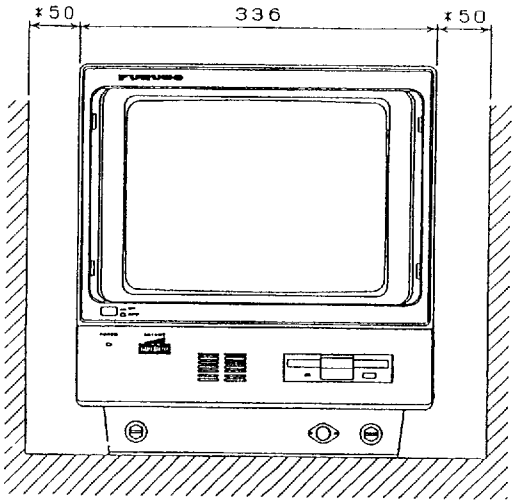

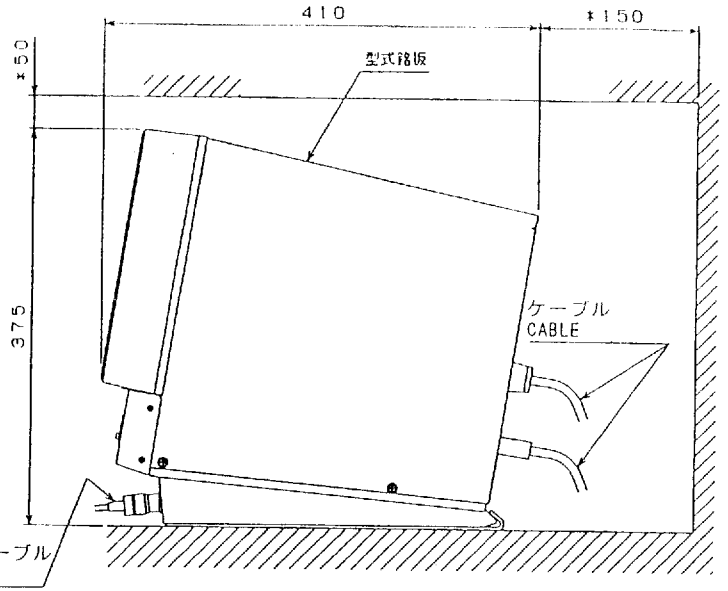

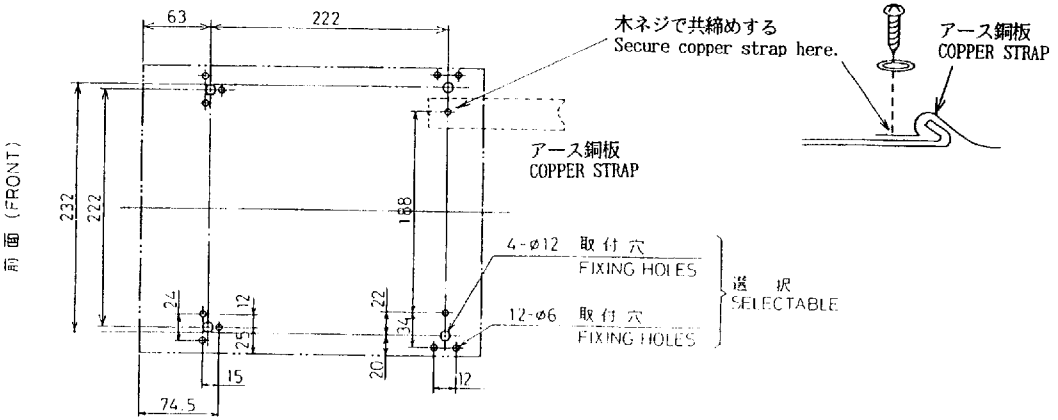

取付寸法 MOUNTING DIMENSIONS

注 記

1) 装備ケーブルはサービス時、指示部を前方に充分引き出せるよう余裕を持たせること。
2) 装備ケーブルの端末処理は 装備要領書参照のこと。
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空間寸法とする。

Notes:

1) Leave sufficient slack in cables so unit can be pulled out with cables connected, for checking and maintenance.
2) For cable processing, see installation manual.
3) For mounting hardware use M10 bolts or coach screws.
4) Asterisk-marked dimensions are maintenance space.

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

承認 APPROVED	May. 25. '90 M. Ishijima	三角法 THIRD ANGLE PROJECTION		名称 TITLE	DP-500 NBDPターミナル NBDP TERMINAL
検図 CHECKED	May. 25. '90 A. Komano	尺度 SCALE	1/5		
製図 DRAWN	MAY. 24. '90 Fujiwara	重量 WEIGHT	18 kg	図番 DWG.NO.	C5520-G01-C

D-1

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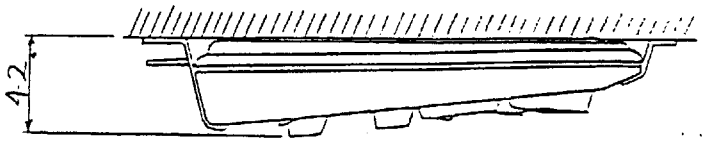

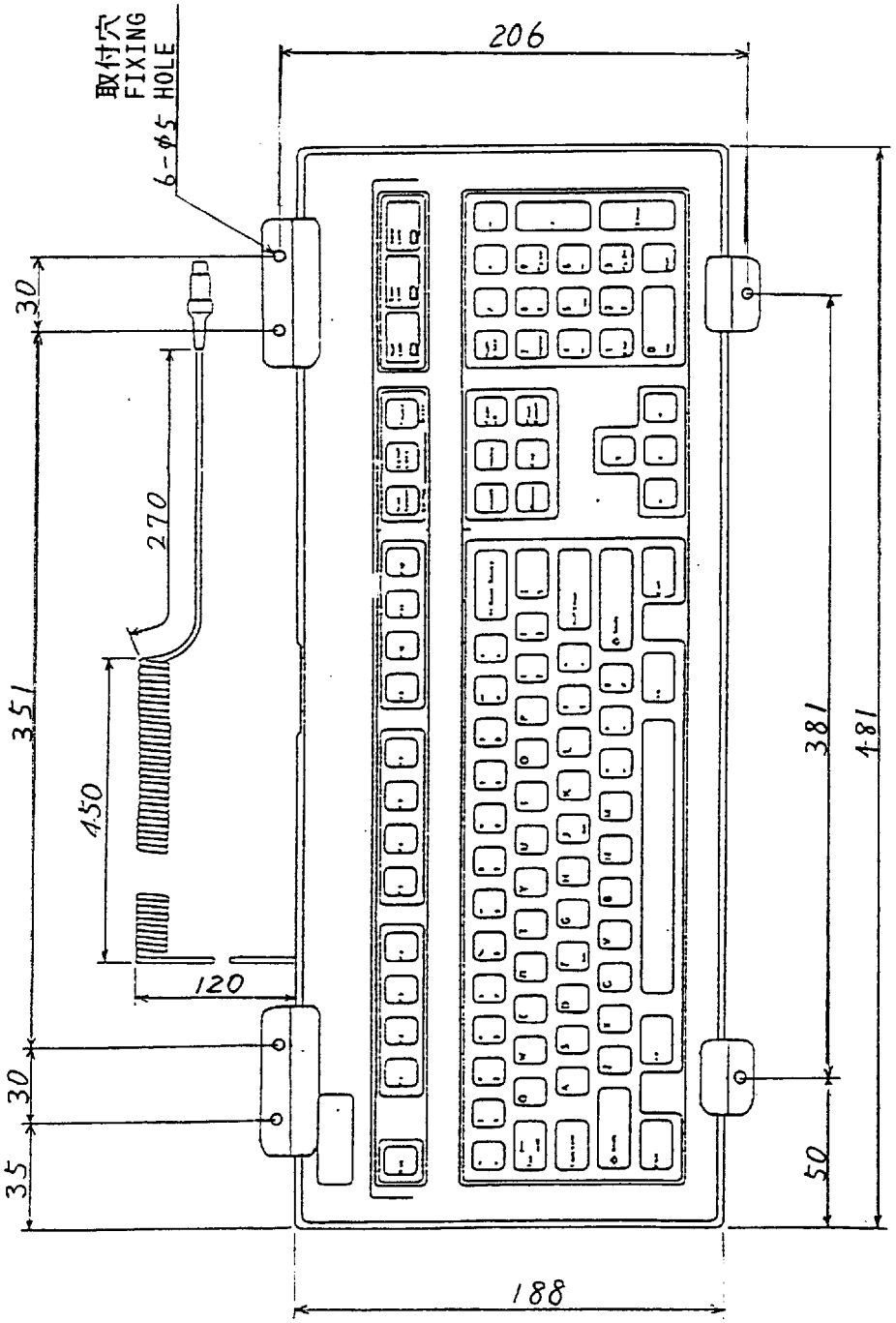

REMARKS				TYPE KB-500, KB-500-B
		DP-5		名称 キーボード
DRAWN T.Y	APPROVED Nov. 15'96 IKEDA	FELCOM 11 FELCOM 10		NAME KEYBOARD
SCALE ∼	MASS 1.7 kg	APPLICABLE TO: (MODEL)	BLOCK NO.	DWG NO. C5520-G02- C

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FURUNO

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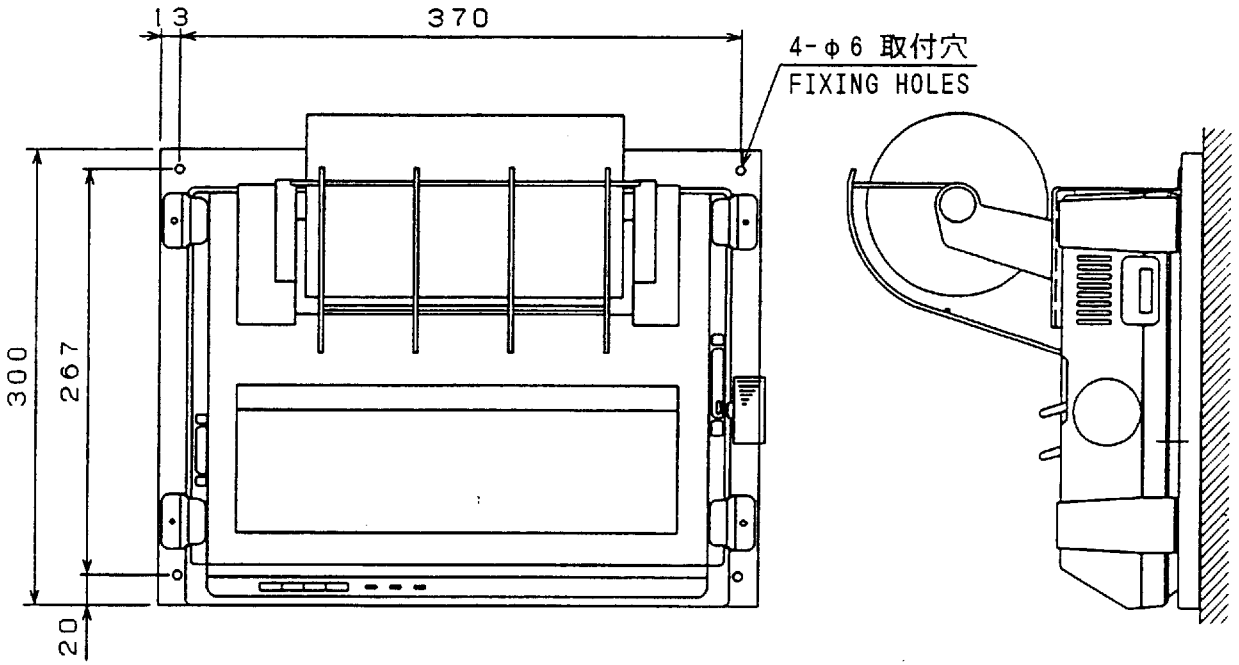

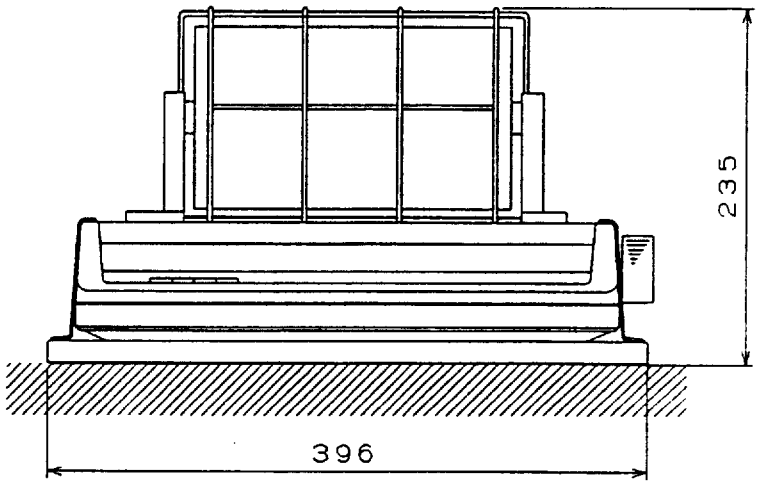

品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.NO.	摘要 REMARKS

承認 APPROVED	M. Oshima	三角法 THIRD ANGLE PROJECTION		名称 TITLE	PP-500 プリンタ PRINTER
検図 CHECKED	Jun. 4. '92 M. Oshihara	R度 SCALE	1/5		
製図 DRAWN	JUN. 4. '92 Fujiwara	重量 WEIGHT	5 kg	図番 DWG.NO.	C5520-G03-C

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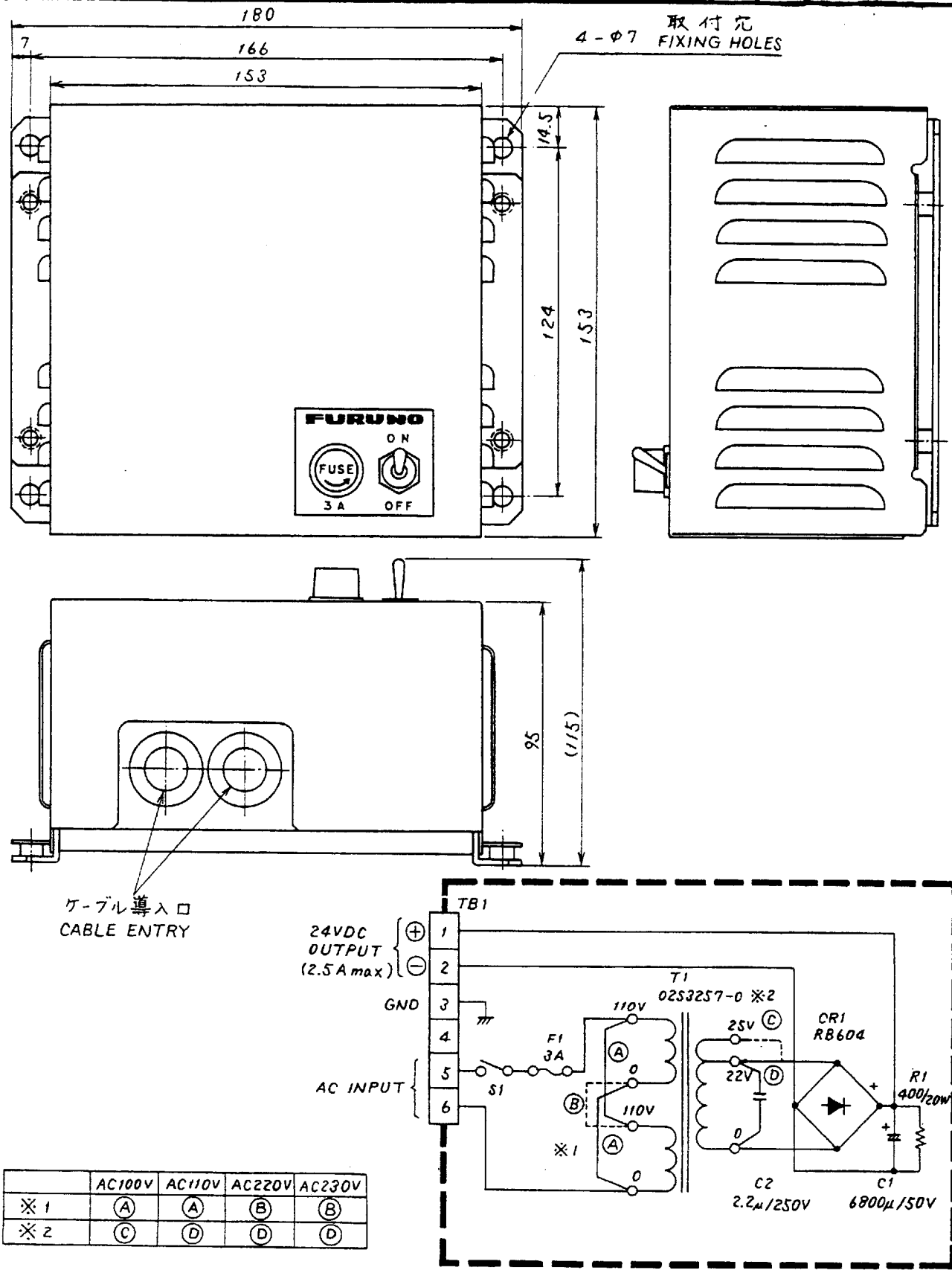
FURUNO

D - 4



	AC100V	AC110V	AC220V	AC230V
※1	A	A	B	B
※2	C	D	D	D

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

承認 APPROVED	JUN.14.'89	三角法 THIRD ANGLE PROJECTION		名称 TITLE	PR-62 整流器外観図 RECTIFIER UNIT
検図 CHECKED		尺度 SCALE	1/2		
製図 DRAWN		重量 WEIGHT	3 kg	図番 DWG.NO.	C5003-034-C

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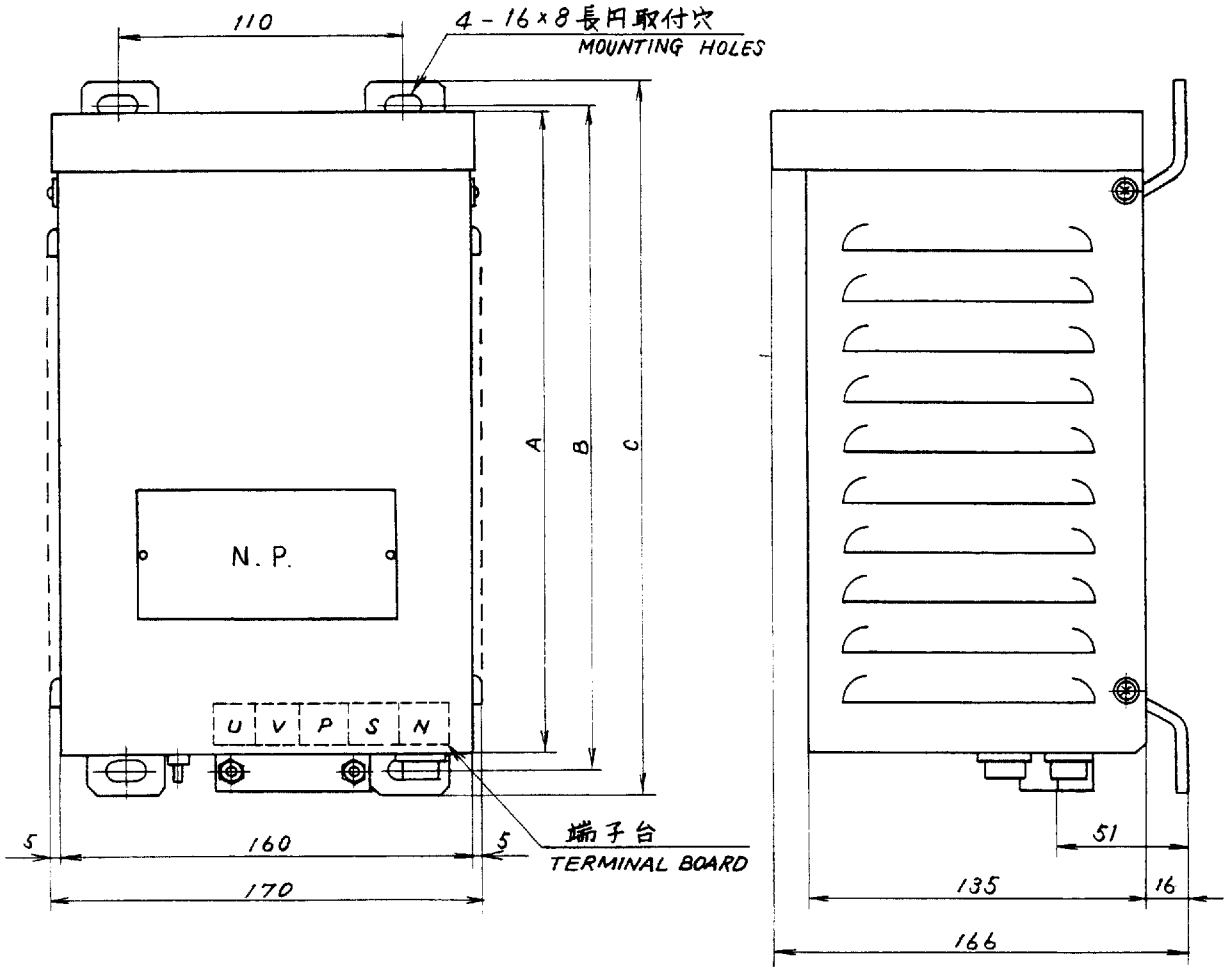
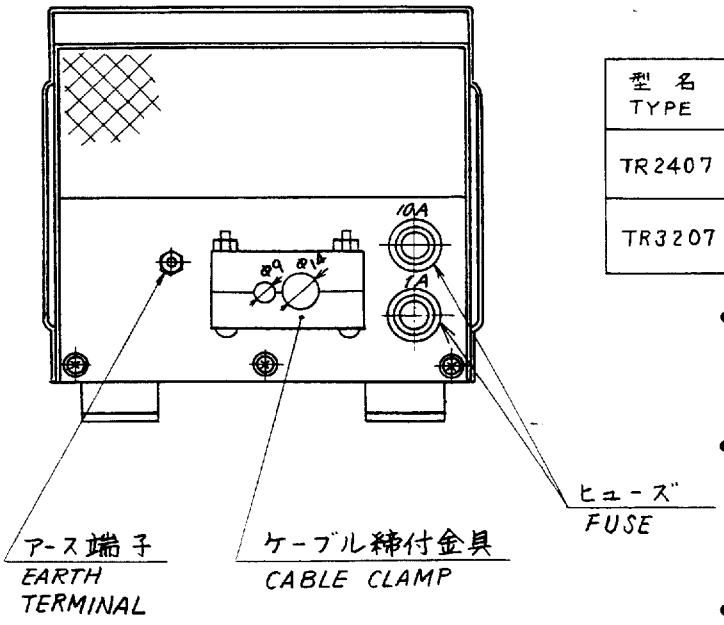
FURUNO

D - 5





型名 TYPE	入力 INPUT	出力 OUTPUT	寸法 DIMENSIONS A	B	C
TR2407	20~30VDC Max. 7A	100±10VAC 60Hz, 0.7A Max. 85VA	255	265	285
TR3207	28~38VDC Max. 5.5A		305	315	335

- コンパス安全距離
  COMPASS SAFETY DISTANCE
  標準 STANDARD : 2.1m
  操舵 STEERING : 1.5m
- 両側及びケーブル導入側に150mm以上のサービススペースをとること。
  MINIMUM SERVICE CLEARANCE FROM BOTH SIDES & WIRING SIDE : 150 mm
- 塗装色 COATING COLOR : MUNSELL 2.5G 7/2

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

承認 APPROVED	SEP. 14. '77	三角法 THIRD ANGLE PROJECTION		名称 TITLE	TR2407/TR3207 (70VA) トランジスタインバータ外観図 TRANSISTORIZED INVERTER OUTLINE
検図 CHECKED	Nov. 19. '77	尺度 SCALE	~~X~~		
製図 DRAWN	Oct. 17. '77	重量 WEIGHT	8.5 kg	図番 DWG. NO.	C2007-017-B

FURUNO ELECTRIC CO., LTD