

# FURUNO

## OPERATOR'S MANUAL

INMARSAT-B MOBILE EARTH STATION

FELCOM 82A ... Class 1  
MODEL FELCOM 82B ... Class 2



**FURUNO ELECTRIC CO., LTD.**  
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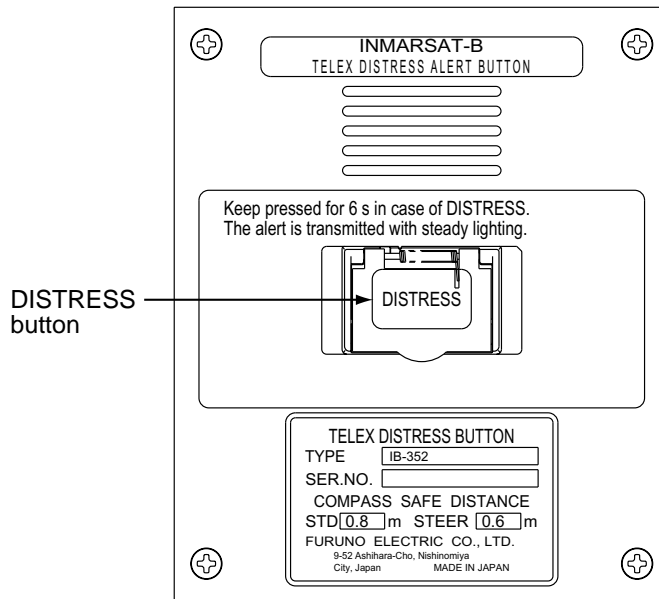


\* O M E 5 6 2 4 0 H 0 0 \*

# DISTRESS PROCEDURES

## Telex Distress Alert Button IB-352 (Class 1 only)

1. Open the distress button cover on the IB-352.
2. Press and hold down the [DISTRESS] button **six seconds**.



Telex Distress Alert Button IB-352

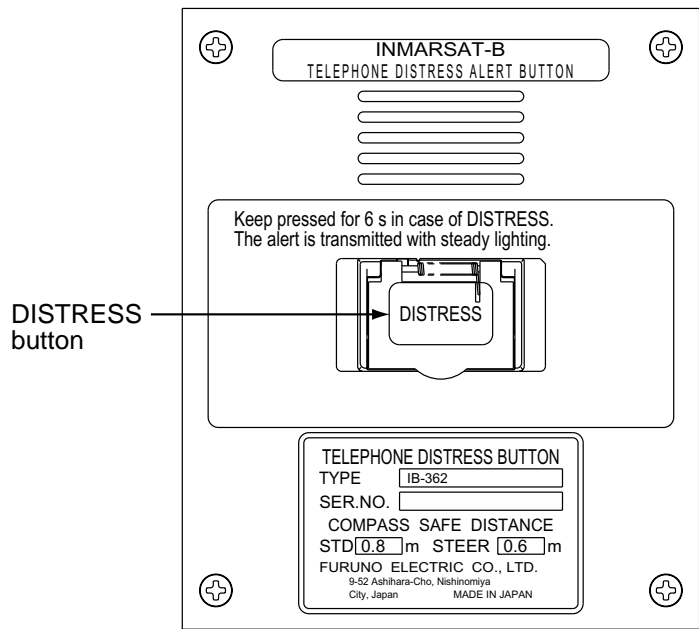
The unit beeps intermittently and the red lamp on the button flashes. When the unit beeps continuously and the red lamp lights, the distress message is sent to the LES. Your outgoing message and message from the LES appear on the terminal unit and are printed.

_____	} Message from designated LES
_____	
_____	
343112345 FURU X -----	Your ship's answerback code
MARITIME	
LAT 34 00 N, LONG 136 00 E -----	Position
04 05 UTC, 24 MAY-----	Date
8-----	Nature of distress (8: Undesignate)
180-----	Ship's course
10-----	Ship's speed
	} These are transmitted.

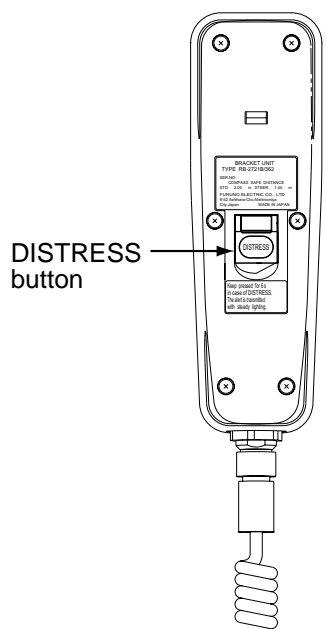
3. After the distress alert has been transmitted the line with the LES remains connected. Send a message to the LES by direct keyboard input.

# Telephone Distress Button IB-362, Handset IB-882-362 (Class 1, Class 2)

The [DISTRESS] button is incorporated in the hanger of the Handset IB-882-362 or in the Telephone Distress Alert Button IB-362 in the case of the Handset IB-882.



Telephone Distress Alert Button IB-362

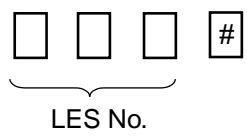


Hanger of Handset IB-882-362

1. Pick up the handset.
2. Open the distress button cover.
3. Press and hold down the [DISTRESS] button **six seconds**.

The distress alert device beeps intermittently and the red lamp on the button flashes. When the device beeps continuously and the red lamp lights, the priority of the handset is set to "Distress."

4. Press the [📞] key on the handset.
5. Dial an LES, referring to Appendix B, and press the [#] key as below. (The beep stops when you are connected with the LES.)



6. Commence communication with LES, giving your ship's name, nature of distress, assistance needed and description of your vessel.



# SAFETY INSTRUCTIONS



## WARNING



**ELECTRICAL SHOCK HAZARD**  
Do not open the equipment.

Only qualified personnel should work inside the equipment.



**Do not approach the radome closer than 6 meters when it is transmitting.**

The radome emits radio waves which can be harmful to the human body, particularly the eyes.

**Leave the equipment powered while underway.**

Distress cannot be communicated unless the equipment is powered.

**Wait at least 30 minutes after turning off the power before entering the radome.**

The gyro motor rotates for some time after the power is turned off.

**Do not disassemble or modify the equipment.**

Fire, electrical shock or serious injury can result.

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

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

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

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



## WARNING

**Do not operate the equipment with wet hands.**

Electrical shock can result.

**Keep heater away from equipment.**

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

**Any repair work must be done by a licensed radio technician.**

Improper repair work can cause electrical shock or fire.

**Use the proper fuse.**

Fuse rating is shown on the equipment. Use of a wrong fuse can result in damage to the equipment.

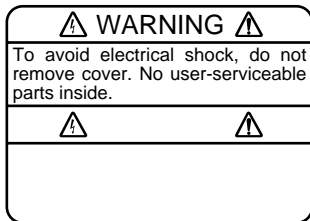


# CAUTION

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

Use of the equipment as a stepping stool, for example, can result in personal injury or equipment damage.

**A warning label is attached to the terminal, communication and antenna units. Do not remove any label. If a label is missing or damaged, contact a FURUNO agent or dealer.**



Terminal, Communication Unit

Name: Warning Label (1)

Type: 86-003-1011-0

Code No.: 100-236-230



## WARNING



Hazardous microwave radiation.  
Can cause severe injury or illness.

Keep at least 6m from INMARSAT-B radome.

Radiation Level	At
100W/m <sup>2</sup>	1.0m
25W/m <sup>2</sup>	4.0m
10W/m <sup>2</sup>	6.0m

### Antenna Unit

Name: Radiation Warning Label

Type: 16-007-7902-0

Code No.: 100-216-340

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# FOREWORD

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## A Word to the Owner of the FURUNO FELCOM 82A/82B

Congratulations on your choice of the FURUNO FELCOM 82A (Class 1), FELCOM 82B (Class 2) Inmarsat-B Mobile Earth Station. We are confident you will see why the FURUNO name has become synonymous with quality and reliability.

For over 50 years FURUNO Electric Company has enjoyed an enviable reputation for quality marine electronics equipment. This dedication to excellence is furthered by our extensive global network of agents and dealers.

This equipment is designed and constructed to meet the rigorous demands of the marine environment. However, no machine can perform its intended function unless operated and maintained properly. Please carefully read and follow the recommended procedures for operation and maintenance.

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

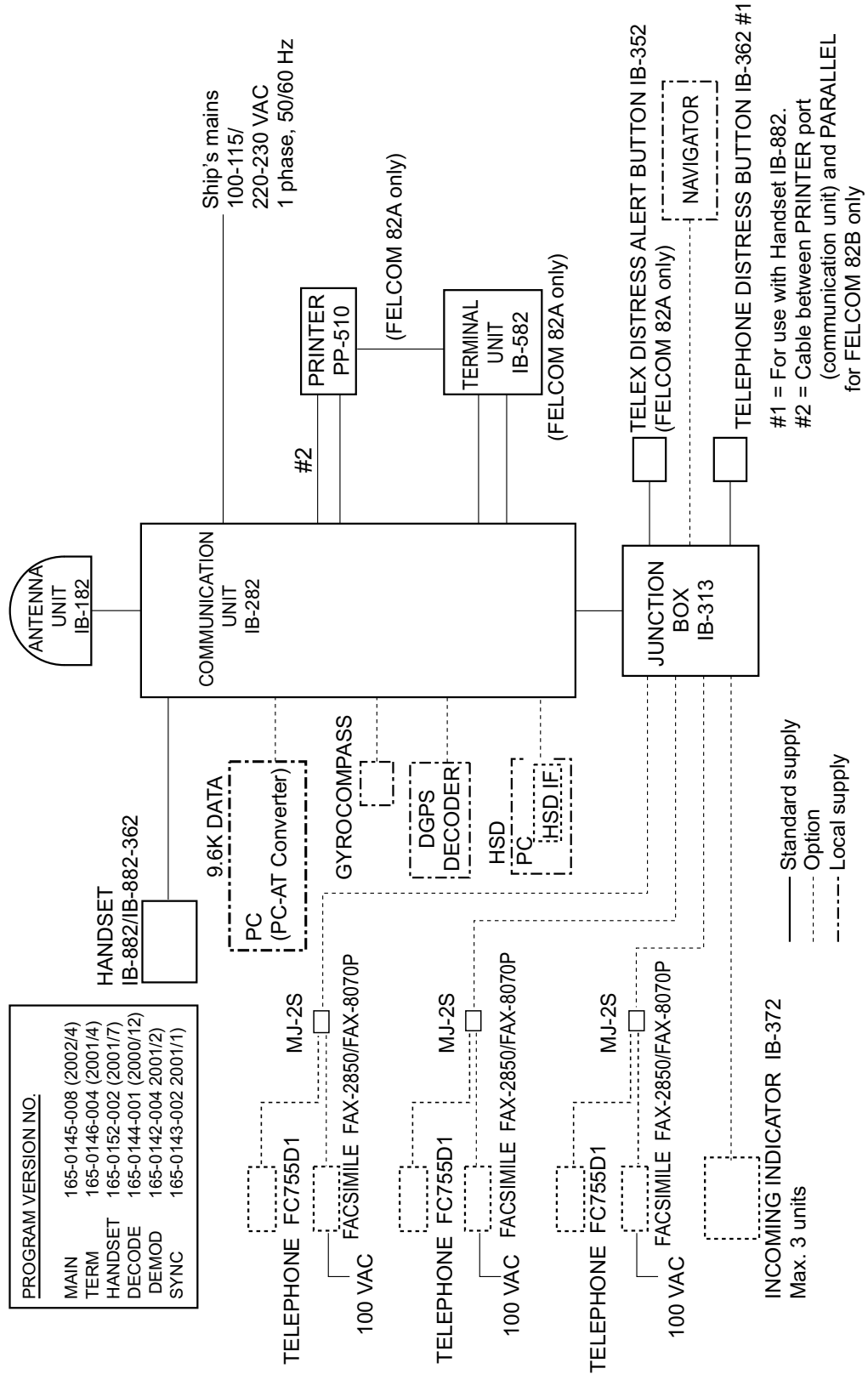
## Features

The FELCOM 82A/82B mainly consists of an antenna unit, communication unit and a handset. FELCOM 82A is additionally equipped with a terminal unit. The FELCOM 82A provides telephone, facsimile, telex and data services. The FELCOM 82B provides the same services as the FELCOM 82A excluding telex.

The main features of the FELCOM 82A/82B are

- Conforms to the following standards: IMO A. 808(19), IMO A. 694(17), IEC 61097-10 (1999), IEC 60945 (1996), IEC 61162-1 (2000)
- Compact handset functions as main telephone
- Automatic telephone/fax switching
- Toll charges calculator
- Personal ID to monitor telephone, handset and fax usage
- Internal gyro interface
- 9.6 kbps data communication
- High speed fax communication
- Automatic input and update of ship's position and gyrocompass heading with position and heading data inputs
- Non-rewind antenna
- HSD communication function provided as standard.

# SYSTEM CONFIGURATION, PROGRAM NUMBERS



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# 1. INMARSAT-B SYSTEM

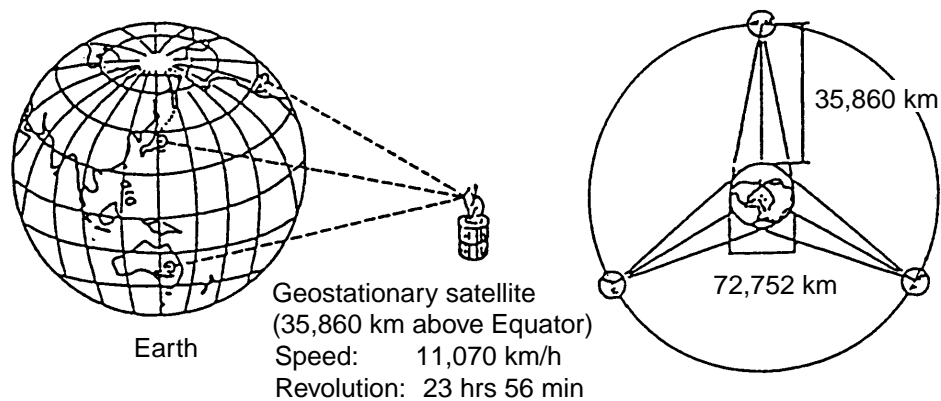
## 1.1 What is Inmarsat?

The International Maritime Satellite Organization (Inmarsat), founded in 1979, is the international governing body for maritime satellite communication. Its purpose is to provide global communications for ships, land mobile and aircraft, using satellites to overcome the problems that exist with conventional radio communications.

The Inmarsat system is made up of three major components: the space segment provided by Inmarsat, the Land Earth Stations (LES) provided by Inmarsat signatories, and Mobile Earth Stations (MES). The Operation Control Center (OCC), located at Inmarsat headquarters in London, controls the overall system.

## 1.2 Geostationary Satellites

The type of satellites used for maritime communication are geostationary satellites. Four satellites, one for each of four ocean regions, are placed in nearly 36,000 km-high 24-hour circular orbits rotating in synchronous with the earth, providing mobile-to-land, land-to-mobile, and mobile-to-mobile communications. The satellites remain fixed over a given place on the earth's equator, so an Inmarsat subscriber is always within coverage of a satellite.



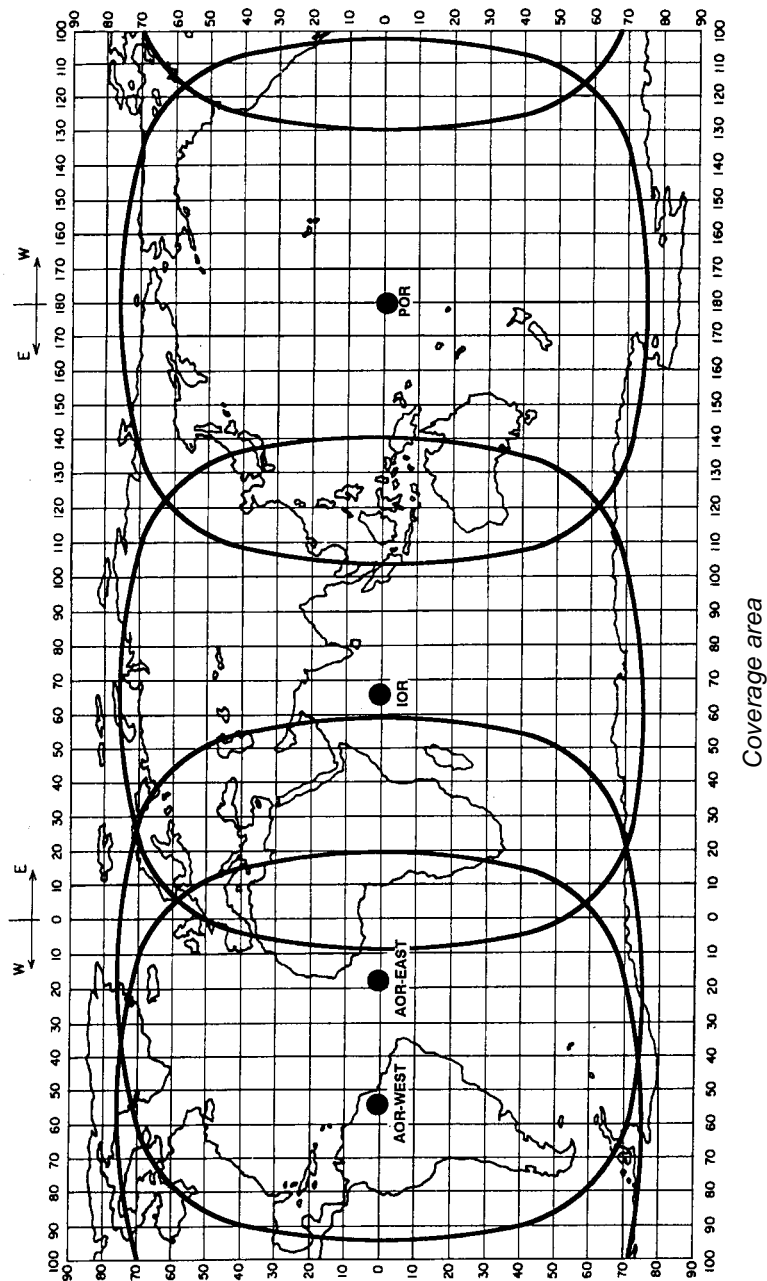
*Geostationary satellites of the Inmarsat system*

### 1.3 Service Area

The Inmarsat system divides the world into four regions and each region is covered by its own satellite. The regions are Atlantic Ocean Region-East (AOR-E), Atlantic Ocean Region West (AOR-W), Pacific Ocean Region (POR), and Indian Ocean Region (IOR). The reason for two regions in the Atlantic Ocean is to solve the coverage gap problem there.

*Inmarsat satellite data*

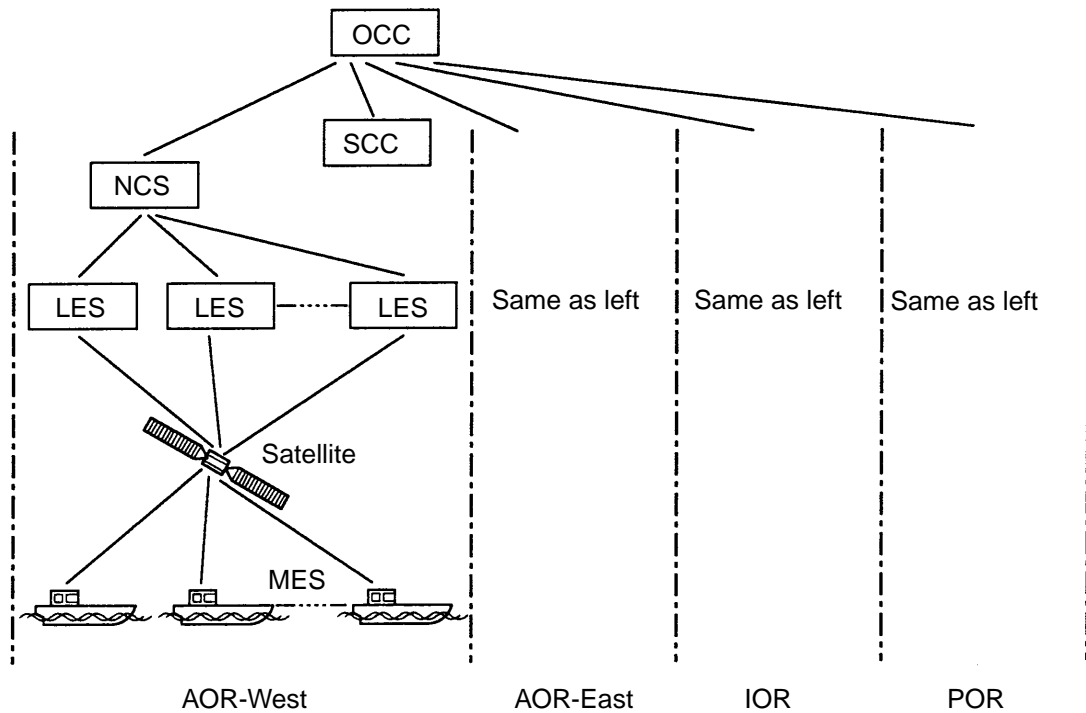
Region	Satellite	Satellite position
AOR-West	Inmarsat-3, F4	54.0°W
AOR-East	Inmarsat-3, F2	15.5°W
IOR	Inmarsat-3, F1	64.0°E
POR	Inmarsat-3, F3	178.0°E





## 1.4 System Bodies

The Inmarsat system consists of the bodies shown in the figure below.



OCC: Operation Control Center  
 SCC: Satellite Control Center  
 NCS: Network Coordination Station  
 MES: Mobile Earth Station  
 LES: Land Earth Station

### *Inmarsat system bodies*

The function of each body in the Inmarsat system is as shown in the table below.

#### *Inmarsat bodies*

Body	Function
Operation Control Center (OCC)	The OCC is the nerve center of the system and is located at the Inmarsat's headquarters in London. The OCC provides continuous, round-the-clock coordination for all functions in the Inmarsat system.
Satellite Control Centers (SCC)	The SCCs main function is to correct satellite rotation error.
Network Coordination Stations (NCS)	Each region has an NCS. The NCS controls the lines of communication and broadcasts information such as navigational warnings, weather reports and news.
Mobile Earth Stations (MES)	Mobile Inmarsat-B stations including aircraft.

## 1.5 Inmarsat-B Services

The Inmarsat-B maritime satellite communication system provides digital telephone (voice), facsimile, telex and data (9600 kbps) and HSD services. Use of the latest digital technology means lower toll charges than in Inmarsat-A, since high output power satellites are not required and data is transmitted at high speed.

## 1.6 Comparison of Inmarsat Systems

Inmarsat provides worldwide communication services for both maritime and land subscribers, and consists of four systems, A, B, C, M and Mini-M. The following table shows the services available with each system.

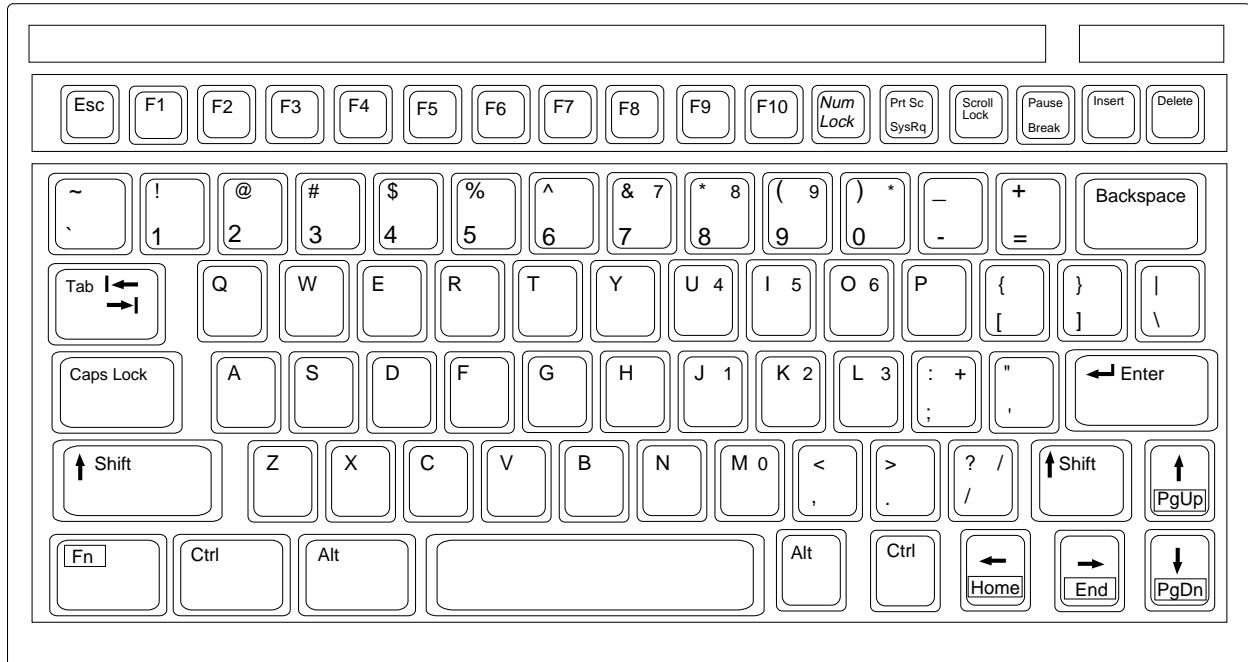
*Comparison of Inmarsat systems*

<b>Service</b>	<b>Inmarsat-A</b>	<b>Inmarsat-B</b>	<b>Inmarsat-C</b>	<b>Inmarsat-M</b>	<b>Inmarsat Mini-M</b>
Voice	YES	YES	NO	YES	YES
Facsimile	YES	YES	NO	YES	YES
Telex	YES	YES	YES	NO	NO
Data	YES	YES	YES	YES	YES
HSD	YES	YES	NO	NO	NO

## 2. SETTING UP

### 2.1 Controls

#### 2.1.1 Terminal unit (Class 1 only)



*Keyboard*

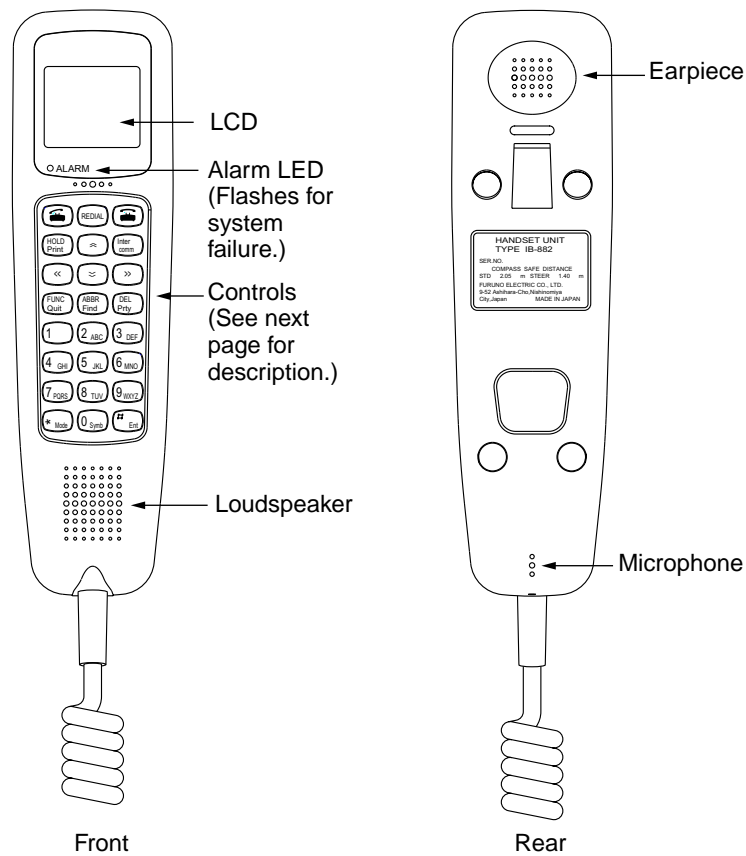
#### **Key description**

- Esc** Cancels key input and returns to previous display screen.
- F1-F10** These keys select menus (F1-F4) and telex functions (F5-F7, F9-F10).
- Backspace** Deletes the character to the left of the cursor.
- Insert** Works the same as PASTE function.
- Delete** Deletes the character to the right of the cursor.
- Home** Moves the cursor to the top of a message being edited.
- End** Moves the cursor to the bottom of a message being edited.
- PgUp** Goes to the previous page of the editor screen.
- PgDn** Goes to the next page of the editor screen.
- ↑, ↓, ←, → Control the cursor.
- Enter** Registers key input.
- Shift** Selects upper and lower case alphabet or numerics and symbols. Press and hold down the key to get upper case letters. Note that only upper case letters are used in telex.

## 2. SETTING UP

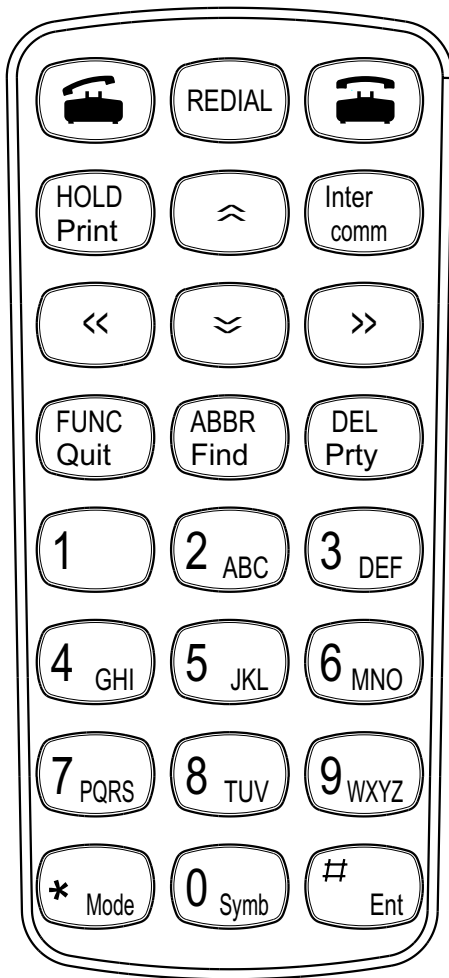
- Alt** Executes the shortcut key operation when combined with an alphabet key. See page 3-39.
- Space Bar** Inserts a space. In addition, it displays file list, partial view of a file, etc. depending on menu.
- Caps Lock** Turns upper case letter input on or off. Press this key while pressing and holding down the [Shift] key to get all capital letters. CAPS appears on the display when the keyboard is set for upper case letter input.
- Tab** Inserts horizontal tab characters. The number of tab characters the key can insert per line of text can be programmed for two, four or eight tabs on the Editor Setup menu.
- Ctrl** Executes the shortcut key operation when combined with an alphabet key. See page 3-40.
- Fn** Combined with an arrow key, it scrolls the screen (↑, ↓) or shifts the cursor (←, →).
- Num Lock** Turns numeric input on or off. Note that you cannot enter some alphabet when the Num LED is lit.
- Note:** In telex, lower case, #, &, \*, \$ and % are not used. A full list of characters usable in telex appears on page D-2.

### 2.1.2 Handset



Handset

**Control description**



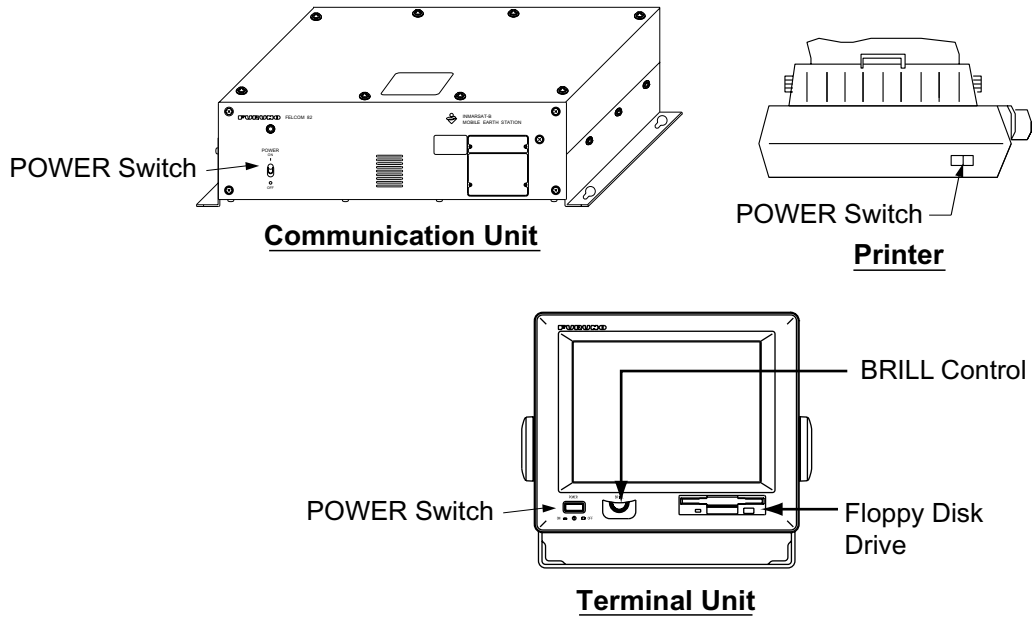
**Symbols**

[.] → [-] → [.] → [\*] → [#] → [(] →  
 [)] → [<] → [>] → [[] → []] →  
 [() → []] → [=] → ['] → ["] → [?] →  
 [:] → [;] → ['] → ["] → ['] → ['] →  
 [+ ] → [.] → [^] → [\$] → [¥] → [%] → [']

Control	Function
	Opens communication line (off hook.)
REDIAL	Redials selected number.
	Disconnects communication line (on hook).
HOLD Print	<ul style="list-style-type: none"> <li>• Holds connected party.</li> <li>• Prints screen showing symbol "□".</li> </ul>
⇧	<ul style="list-style-type: none"> <li>• Shifts cursor upward.</li> <li>• Increases earpiece volume.</li> </ul>
Intercomm	Turns intercom on/off.
⇐	<ul style="list-style-type: none"> <li>• Shifts cursor leftward.</li> <li>• Selects menu option, parameter.</li> </ul>
⇩	<ul style="list-style-type: none"> <li>• Decreases earpiece volume.</li> <li>• Shifts cursor downward.</li> </ul>
⇒	<ul style="list-style-type: none"> <li>• Shifts cursor rightward.</li> <li>• Selects menu option, parameter.</li> </ul>
FUNC Quit	<ul style="list-style-type: none"> <li>• Opens/closes menu.</li> <li>• Returns to standby display.</li> </ul>
ABBR Find	Abbreviated dialing number functions
DEL Prty	<ul style="list-style-type: none"> <li>• Selects priority.</li> <li>• Deletes entry.</li> </ul>
1 – 9	• Inputs corresponding alphabet or numeric.
* Mode	<ul style="list-style-type: none"> <li>• Separator</li> <li>• Alternately enables alphabet and numeric input.</li> <li>• Alternately selects East/West and North/South and vice versa.</li> </ul>
0 Symb	• Inputs "0" and symbols (see figure at left).
# Ent	<ul style="list-style-type: none"> <li>• End code</li> <li>• Terminates menu operation.</li> </ul>

## 2.2 Turning On the Power

There is no particular order for turning on the units of the system. The handset is powered when the communication unit is turned on.



### *Location of power switches*

When the communication unit is powered it supplies power to the handset and the antenna unit. If a navigator and gyro are connected, the antenna unit is automatically oriented towards the satellite selected. Several minutes later the satellite is "acquired" and the system goes into stand-by, awaiting communications. You can see the standby displays for the terminal unit and handset on the next page.

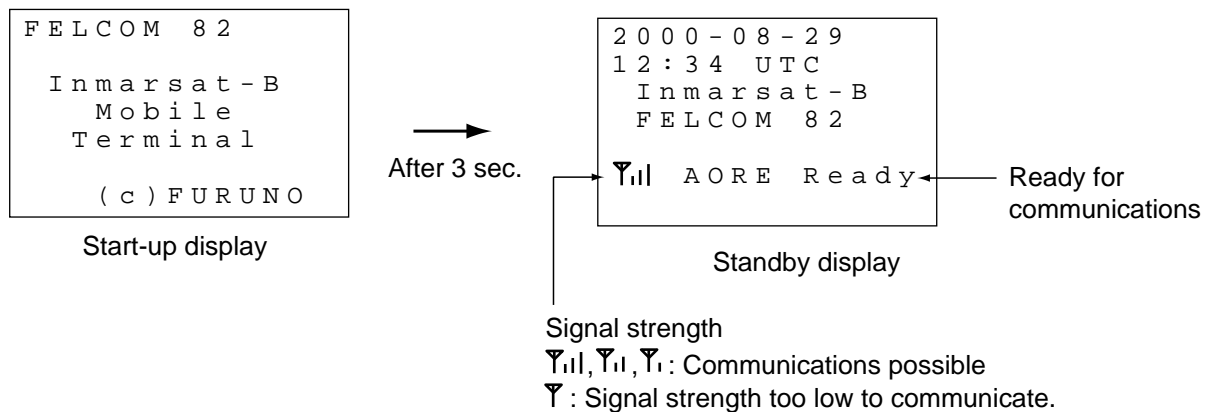
The standby display on the terminal unit appears about ten seconds after turning on the power. After turning on the power, you can begin communications when the message "Ocean Region registration complete" appears. (The Channel Status indication should show "SYNC" and the MES Status indication, "Ready".) This takes about five minutes.

File	Edit	Telex	Setup	WRU	HRIS	BELL	AlmRst	Break
----- (00-09-08 15:04) -----								
Date	2000-09-08			Tx EIRP Level	000			
Time	15:04(UTC)			Tx RF Level	000			
				Rx C/N	053			
Current Satellite	POR			Rx IF AGC Level	154			
Channel Status	SYNC							
MES Status	Ready			Rx SYN	OK			
Tx	OFF			Tx SYN	OK			
Heading	270 DEG							
Antenna Bearing	209 DEG							
Antenna Azimuth	119 DEG			Antenna Status	REMOTE			
Antenna Elevation	30 DEG			El AXIS	OK			
				Az AXIS	OK			
Position	LAT	34:00.00N		Cross EI AXIS	OK			
	LON	135:00.00E						
NAV DATA	NMEA			Rx Channel	11292			
GYRO DATA	OK			Tx Channel	10000			

Indications shown when equipment is ready to communicate.

*Standby display (terminal unit)*

The handset goes into standby about three seconds after the communications unit is turned on. "Ready" appears when the handset is ready for communications. When the power is supplied to the handset the display screen changes in the following sequence.



*Standby display (handset)*

## 2. SETTING UP

When “Ready” is displayed on the terminal unit and handset the following can be done, with the equipment in the default setting.

### **Handset, telephone communications**

- When the handset rings, pick it up and press the [📞] key to communicate with party.
- When a telephone rings, pick up its receiver and communicate with party.
- Dial subscriber’s number (LES, subscriber’s number or ship ID) to communicate.

For handset operation see Chapter 4 and for telephone operation see Chapter 5.

### **Telex communications (Class 1 only)**

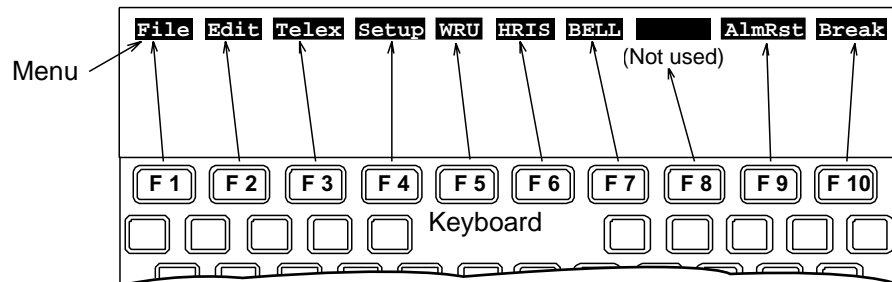
- Send a telex message automatically, provided that station and LES have been registered in the equipment.
- Receive and read a telex message.

For details see Chapter 3.



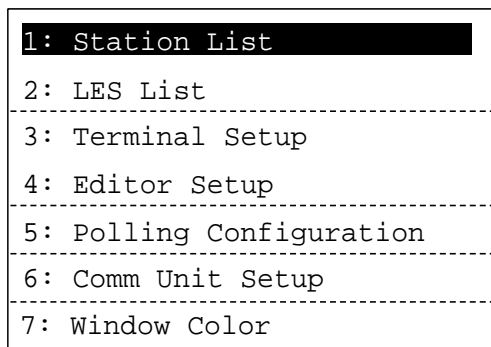
## 2.3 Menu Operational Overview

### 2.3.1 Terminal unit (Class 1 only)



#### *Menu*

1. To select a menu or function press the corresponding function key F1-F10 (F8 is not used). For example, press the [F4] key to display the Setup menu.

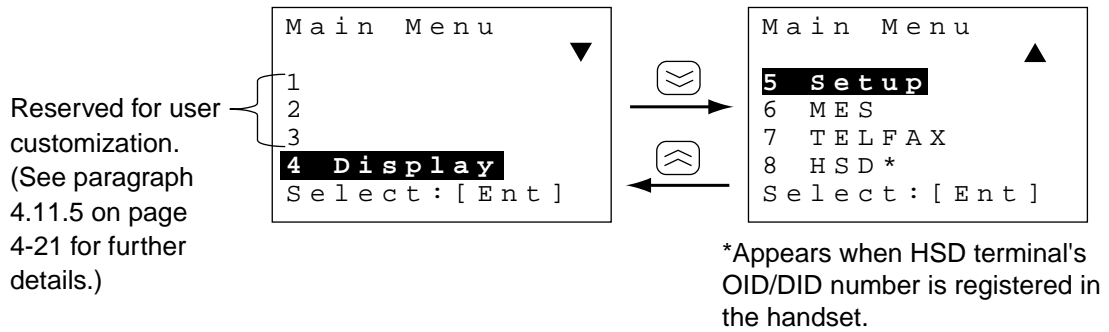


#### *Setup menu*

2. Key in desired menu number with the numeric keys. Alternately you may select a menu by using the [↑] or [↓] key and then pressing the [Enter] key.
3. After setting option, press the [Enter] key.
4. Press the [Esc] key to return to the standby display.

### 2.3.2 Handset

1. Press the [FUNC Quit] key to display the main menu. Note that some menus and displays show triangle(s) and/or a square at the top right-hand corner of the display. See page 4-2 for their meanings.



*Main menu (default menu)*

2. Press appropriate numeric key to choose menu desired, or use the [↵] or [⇐] key to select menu desired and press the [Ent] key.
3. Press the [FUNC Quit] key several times to close the menu.

## 2.4 Adjusting Display Brilliance

### 2.4.1 Terminal unit (Class 1 only)

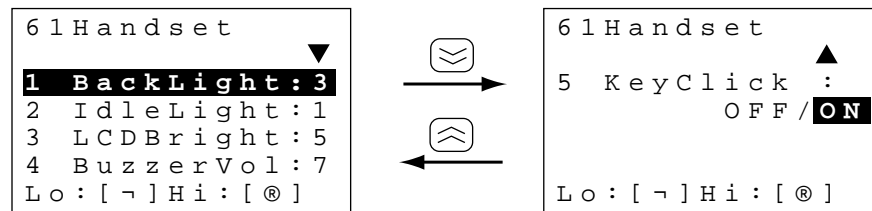
Adjust the [BRILL] control to suit lighting conditions.

**Note:** If the terminal unit is turned off with brilliance set to minimum the display will be black when the terminal unit is turned on again. Use the [BRILL] control to adjust display brilliance.

### 2.4.2 Handset

The handset has facilities for adjustment of keyboard and LCD backlighting, LCD contrast, key beep on/off, and call ring volume.

1. Press [FUNC Quit], [6] and [1] to display the Handset menu.



*Handset menu*

2. Press appropriate numeric key referring to above illustration to select item and then press [◀] or [▶] to set level. For IdleLight and KeyClick select ON or OFF.

**BackLight:** Sets backlighting for the LCD and keyboard. Setting range: 0 – 3, Default: 3. “0” provides no backlighting.

**IdleLight:** Turns backlighting for the LCD and keyboard on or off when the handset is hung in the hanger. Settings: ON, OFF, Default: OFF.

**LCDBright:** Adjusts brightness of LCD. Setting range 0 – 9, Default: 5. “0” provides no brightness.

**BuzzerVol:** Adjusts volume of call ring. Setting range: 0– 9, Default: 7. “0” turns off the call ring.

**KeyClick:** Turns key beep, which sounds for valid key input, on or off. Settings: ON, OFF, Default: ON.

3. Press the [Ent] key.
4. Press the [FUNC Quit] key several times to close the menu and return to the standby display.

## 2.5 Registering the Password at the Handset

There are two handset menu modes: User and Administration. The User mode provides only a simple menu. The Administration mode requires a password to open menus. When the system is powered the User mode is in effect.

The password set at the factory is 0000. In this setting you can go into the Administration mode without a password. To require a password with the Administration mode enter it as follows:

1. Press [FUNC Quit], [6] and [7] to display the Password input screen.

```

6 7 P a s s w o r d

O l d   : █ _ _ _ _
N e w   : _ _ _ _ _
C o n f : _ _ _ _ _

E n t e r : [ E n t ]

```

*Password input screen*

2. Key in 0000. Password is shown with asterisks. If you are not using the factory-set password (0000) enter current password.
3. Press the [↵] key to select the New field.
4. Enter password desired and press the [Ent] key. You may use any four numerals for the password.
5. Press the [↵] key to select Conf.
6. Enter password again and press the [Ent] key. The message “The password is changed.” is displayed.
7. Press the [FUNC Quit] key to close the menu. (If the password entered is invalid the message “Password error!” appears. Enter the password again.)

Store the password in a safe place. To clear the password, enter old password in the Old field and 0000 in both the New and Conf fields.

**Note:** Normally the operational mode is the “User mode.” To change to the Administration mode, do the following:

- a) Press [FUNC Quit], [6] and [3] to display the Change Mode input screen.

```

6 3 C h a n g e   M o d e

U s e r → A d m i n
E n t e r   P a s s w d :
           █ _ _ _ _

E n t e r :   [ E n t ]

```

- b) Enter four digit-password and press the [Ent] key. Password entered is shown with asterisks.

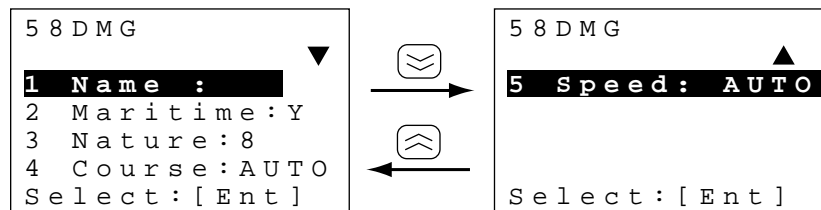
## 2.6 Distress Message Setup (Class 1 only)

The distress message, transmitted when the Telex Distress Alert Button IB-352 is operated, may be set up from the handset and terminal unit.

This procedure is done from the Administration mode. See page 2-10 for how to choose the Administration mode.

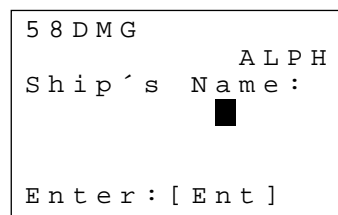
### Ship's name

1. Press [FUNC Quit], [5] and [8] to show the DMG menu.



*DMG menu*

2. Press the [1] key to show the Ship's Name input screen.



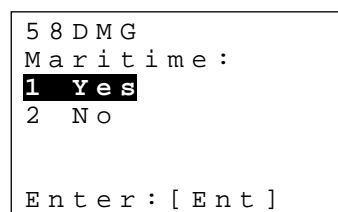
*DMG menu, ship's name input screen*

3. Enter your ship's abbreviated name (telex answerback code) in four alphanumeric characters with the alphanumeric keys and press the [Ent] key. If an invalid name is entered the message "Input Error. Invalid data." appears and three seconds later the main menu is shown.
4. Press the [FUNC Quit] key to close the menu.

### Inmarsat station type (ship or shore)

The default station type is maritime; do not change the setting.

1. Press [FUNC Quit], [5] and [8] to show the DMG menu.
2. Press the [2] key to select Maritime.



*DMG menu, station type entry*

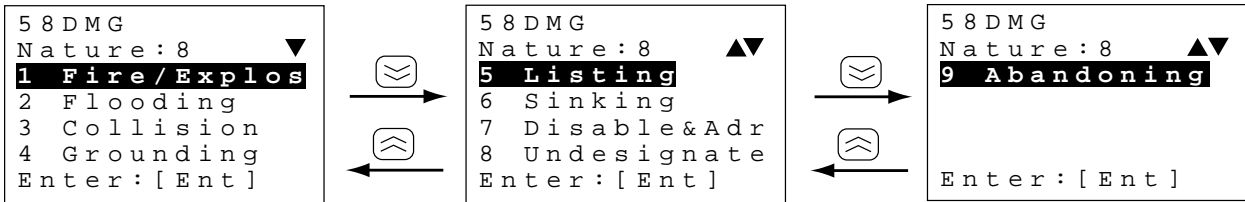
## 2. SETTING UP

3. Press the [1] key to select Yes for ship station, or press the [2] key to select No for shore station.
4. Press the [Ent] key followed by the [FUNC Quit] key.

### **Nature of distress**

Select nature of distress. The default nature of distress is Undesignated.

1. Press [FUNC Quit], [5] and [8] to show the DMG menu.
2. Press the [3] key to select Nature.



*DMG menu, nature of distress options*

3. Press appropriate numeric key to select nature of distress (default: 8 Undesignated). You can toggle between the three nature of distress screens with the [↵] and [⇩] keys.

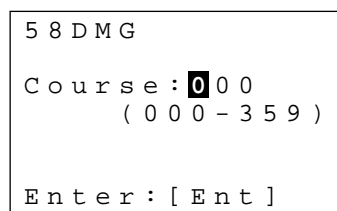
**Note:** The nature of distress is automatically restored to “Undesignated” after one hour.

4. Press the [Ent] key followed by the [FUNC Quit] key.

### **Course**

Do this step when there is no course data due to position-fixing equipment failure.

1. Press [FUNC Quit], [5] and [8] to show the DMG menu.
2. Press the [4] key to select Course.



*DMG menu, course input screen*

3. Enter course with the numeric keys.
4. Press the [Ent] key.
5. Press the [FUNC Quit] key to close the menu.

**Speed**

Do this step if it is necessary to enter speed manually because of GPS navigator failure.

1. Press [FUNC Quit], [5] and [8] to show the DMG menu.
2. Press the [5] key to select Speed. (The speed 99 knots is shown when no navigator is connected.)

```
5 8 D M G
Speed : 99
        ( 0 0 - 9 9 )
Enter : [ Ent ]
```

*DMG menu, speed input screen*

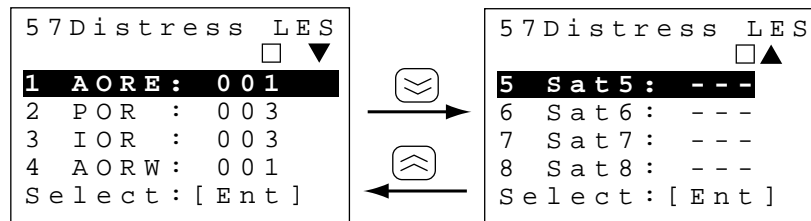
3. Enter speed with the numeric keys.
4. Press the [Ent] key. If invalid data is entered the message "Input Error. Invalid data." appears and three seconds later the main menu is shown.
5. Press the [FUNC Quit] key to close the menu.

**Note:** This procedure may also be done from the terminal unit. The keying sequence is [F4], [6], [2], [Enter].

## 2.7 Choosing Where (LES) to Transmit Own Ship's Distress Signal

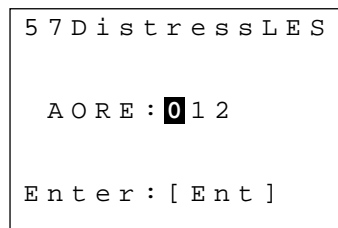
Select the LES where your vessel will transmit the distress signal. This procedure is done from the Administration mode. See page 2-10 for how to change to the Administration mode.

1. Press [FUNC Quit], [5] and [7] to show the Distress LES menu.



*Distress LES menu*

2. Press appropriate numeric key to select an ocean region. For example, select AOR-E. Your display should look as below.



*Distress LES input screen, AORE selected*

3. Key in LES to use in three digits and press the [Ent] key.
4. Repeat steps 2 and 3 to enter distress LES for other regions.
5. Press the [FUNC Quit] key several times to close the menu.

**Note:** This procedure may also be done from the terminal unit. The keying sequence is [F4], [6], [3], [Enter], [1], [Enter].

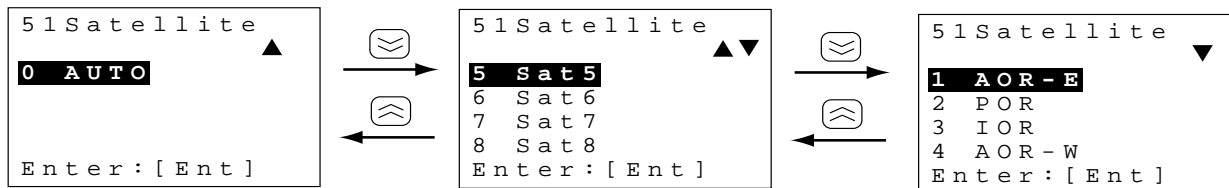


## 2.8 Setting Up the Handset, Communication Unit

### 2.8.1 Selecting ocean region to use

Ocean region is selected according to current position. In the default setting the ocean region is automatically selected (position and heading data required) when the system is powered. If you are in a region where coverage overlaps you can select the satellite manually as shown below.

1. Press [FUNC Quit], [5] and [1] to display the Satellite menu.



*Satellite menu (default order)*

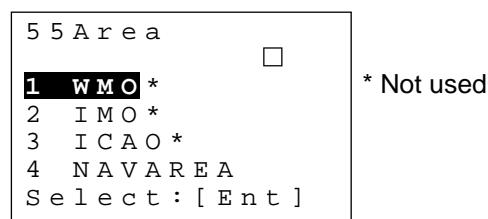
2. Press corresponding numeric key to select satellite to use. AUTO provides for automatic selection of satellite. Sat 5-Sat 8 are not used. You can toggle between satellite selection screens with the [↗] and [↘] keys.
3. Press the [FUNC Quit] key several times to close the menu.

**Note:** This procedure may also be done from the terminal unit. The keying sequence is [F4], [6], [1], [Enter], [1], [Enter].

### 2.8.2 Choosing navarea(s) from which to receive Inmarsat services

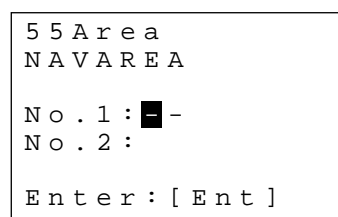
You may select Navarea(s) from which to automatically receive information, for example, weather broadcasts.

1. Press [FUNC Quit], [5] and [5] to display the Area menu.



*Area menu*

2. Press [4] to select NAVAREA. (WMO, IMO and ICAO are not applicable to Inmarsat.)



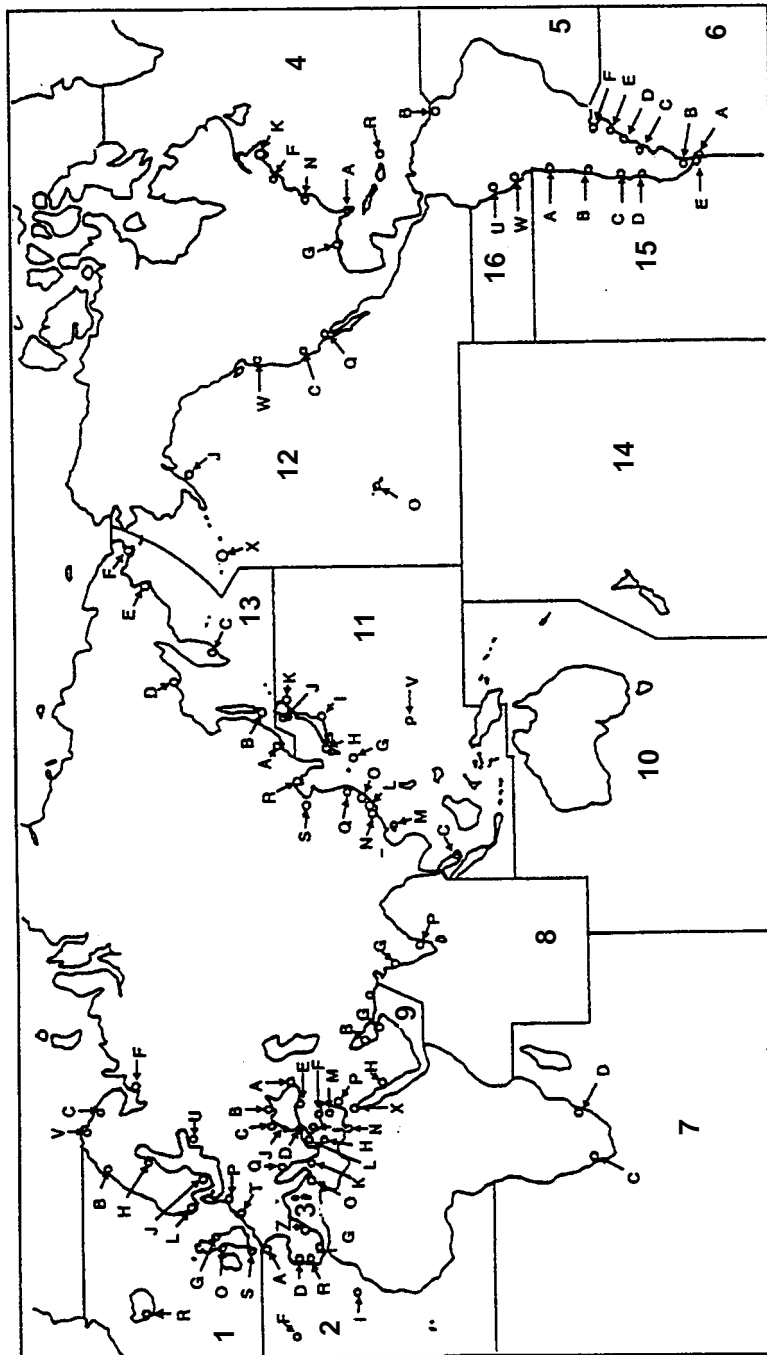
*Area menu, NAVAREA selected*

## 2. SETTING UP

3. Enter area number in two digits (enter leading zero in case of one-digit navarea) with the numeric keys and press the [Ent] key. See the map below for navarea number.
4. Press the [FUNC Quit] key several times to close the menu and return to the standby display.

**Note 1:** This procedure may also be done from the terminal unit. The keying sequence is [F4], [6], [3], [Enter], [2], [Enter].

**Note 2:** If invalid data is entered, the message "Input Error! Input data is invalid." appears and three seconds later the main menu appears.



Navarea map

## 2.9 Manual Entry of Position

When position data from the GPS navigator is not being received correctly, enter latitude and longitude position manually from the handset in order to acquire and track a satellite manually. When there is no position input, the status indication for NAV DATA on the terminal unit changes from NMEA to NONE and the NAV indication on the handset flashes.

1. Press [FUNC Quit], [5], [4] to show the Position input screen.

```

5 4 P o s i t i o n
LAT : 0 0 . 0 0 N
LON : 0 0 0 . 0 0 E

N / S : [ M o d e ]
E n t e r : [ E n t ]

```

*Position input screen*

**Note:** If position data is correctly input from a navigator current position and the message “NMEA valid” are shown on the position input screen. In this case entry of position is not necessary.

2. The cursor is selecting LAT. Enter latitude with the numeric keys. Use the [Mode] key to switch coordinate from North to South and vice versa if necessary.
3. Press [⇐] to select LON. Enter longitude similar to how you entered latitude.
4. Press the [Ent] key to conclude input.
5. Press the [FUNC Quit] to close the menu and return to the standby display.

**Note:** If invalid data is entered, the message “Input Error! Input data is invalid.” appears and three seconds later the main menu appears.

## 2.10 Manual Entry of Heading

When heading data from the heading sensor is not being received correctly, enter heading manually from the handset in order to acquire and track a satellite manually. The system indicates no or wrong heading data by displaying “GYRO DATA NONE” on the terminal unit and flashing “GYRO” on the handset.

Further, to match the FELCOM 82’s heading display with heading sensor readout input heading manually as below.

1. Press [FUNC Quit], [5] and [2] to display the Gyro input screen.

```
5 2 Gyro
Gyro : 000
Hold : ON
Enter : [Ent]
```

*Gyro input screen*

2. Press [≡].
3. Press [⏪] to select ON. (This enables manual input of heading.)
4. Press [⏩].
5. Key in current heading with the numeric keys.
6. Press [≡].
7. When the gyrocompass readout becomes the same as the heading entered at step 5, select the HOLD field and press [⏪] to select OFF. (This lets the gyrocompass follow the heading set at step 5.)
8. Press the [Ent] key.
9. Press the [FUNC Quit] key several times to close the menu.

## 2.11 Setting Date, Time

This section shows you how to input date and time and choose time format and time zone.

**Note 1:** This procedure is done from the Administration mode. See page 2-10 for how to choose the Administration mode.

**Note 2:** Input of date and time are not necessary when the system is interfaced with a GPS navigator and it is functioning.

### Date and time

1. Press [FUNC Quit], [6] and [4] to show the Date&Time menu.

```

6 4 D a t e & T i m e
1  D a t e & T i m e
2  D a t e F o r m
3  T i m e Z o n e
S e l e c t : [ E n t ]

```

*Date&time menu*

2. Press the [1] key to select "1 Date&Time."

```

6 4 D a t e & T i m e
D a t e :
2 0 0 0 - 0 3 - 0 1
T i m e
0 0 : 0 0 ( U T C )
E n t e r : [ E n t ]

```

*Date&time input screen*

3. Enter year in four digits, and date, month and day in two digits each including leading zero where necessary. Use the [⟨] or [⟩] key to select location.
4. Press [≈].
5. Key in UTC time and press the [Ent] key.
6. Press the [FUNC Quit] key several times to close the menu.

If you enter invalid data the message "Input Error! Input data is invalid." Is displayed and three seconds later the main menu appears.

## 2. SETTING UP

### Date form

1. Press [FUNC Quit], [6], [4] and [2] to show the Date Form menu.

```
6 4 Date & Time
Date Form :
1  YYYY - MM - DD
2  MMM - DD - YYYY
3  DD - MMM - YYYY
( FEB - 29 - 2000 )
Enter : [ Ent ]
```

#### *Date form menu*

2. Press appropriate numeric key to choose date format desired and press the [Ent] key.
3. Press the [FUNC Quit] key several times to close the menu.

### Time zone

The Inmarsat system uses UTC time. If you would rather use local time, enter the time difference between it and UTC as shown below.

1. Press [FUNC Quit], [6], [4] and [3] to show the Time Zone input screen.

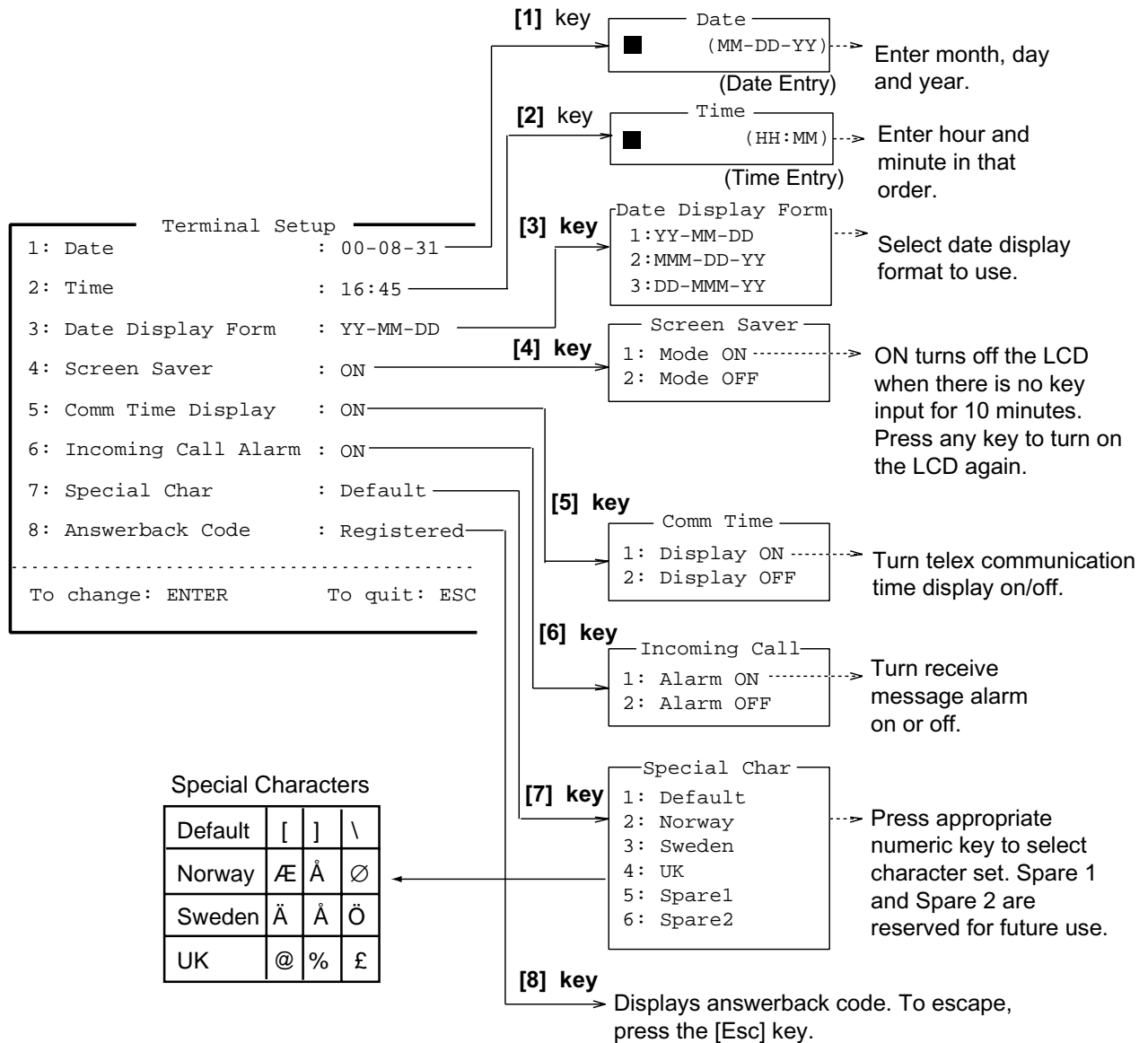
```
6 4 Date & Time
Time Zone :
+ 0 0 : 00
Zone Name : UTC
Dn : [ ↓ ] Up : [ ↑ ]
Enter : [ Ent ]
```

#### *Time zone input screen*

2. Use the [↗] or [↘] key to enter time difference between your time and UTC time. Each press increments (decrements) the hour digit by one hour. The setting range is -13 to +13.
3. Select minute position with [↘] and enter minutes with the [↗] or [↘] key. Each press increments (decrements) the minute indication by 15 minutes.
4. Press the [↘] key to select Zone Name.
5. Enter the name of the time zone in three letters with the alphabet keys and press the [Ent] key. For example, if you want to use Japan Standard Time, enter JST. For how to enter alphabet see page 4-2. If an invalid zone is entered the message "Input Error! Input Time zone is invalid." is displayed and three seconds later the main menu appears.
6. Press the [FUNC Quit] key several times to close the menu.

## 2.12 Terminal Unit Setup (Class 1 only)

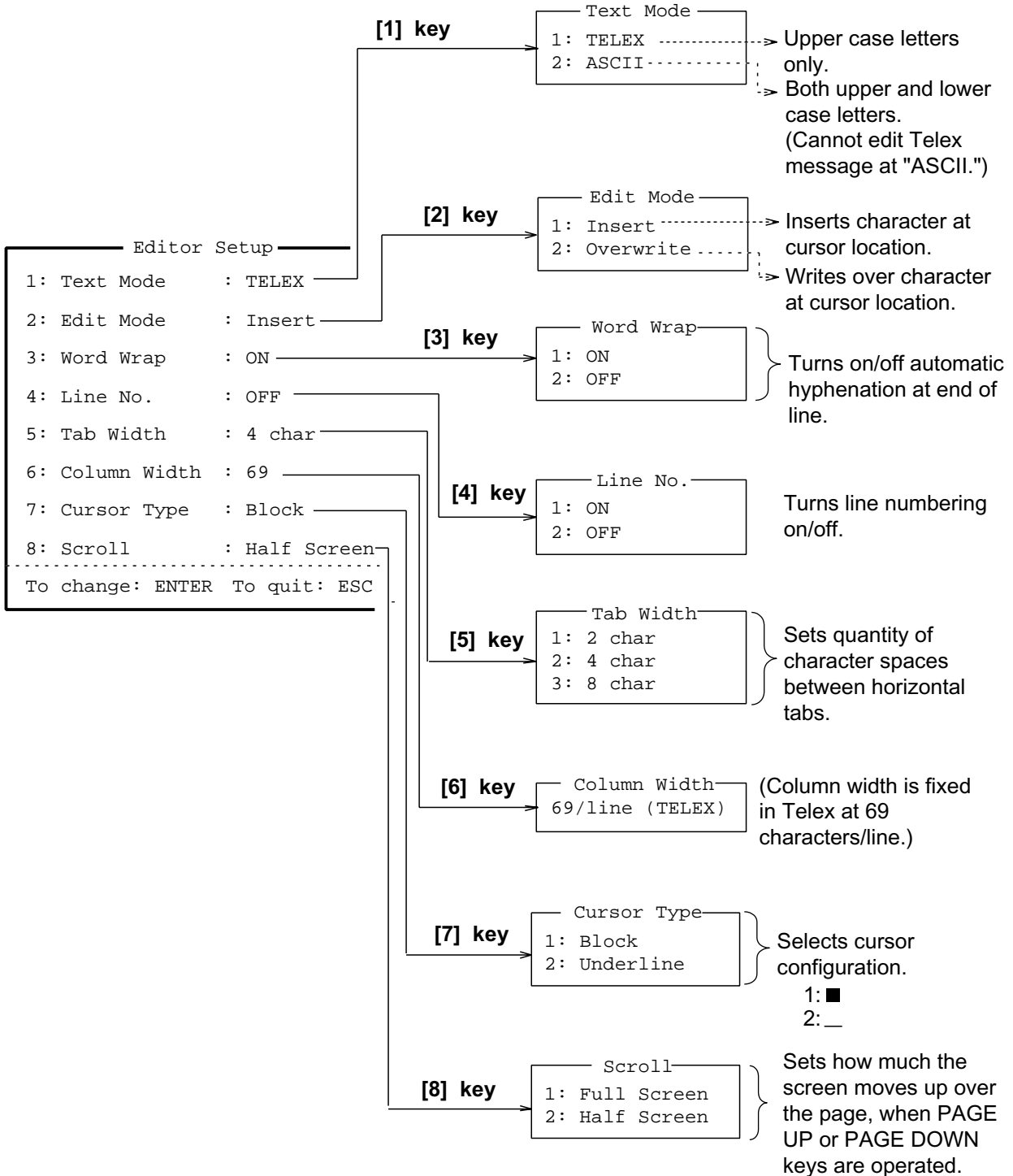
The terminal unit is set up on the Terminal Setup menu. Press [F4] followed by [3] to display this menu. Default settings are as shown in the figure below.



Terminal setup menu

## 2.13 Editor Setup (Class 1 only)

The "editor screen" is where you will create and edit files, and you may format it as desired on the Editor Setup menu. Press [F4] followed by [4] to show this menu. Default settings are as shown in the figure below.



*Editor setup menu*



## 2.14 Terminal Unit Display Color

You may change the background and foreground colors for the various display screens on the terminal unit as follows:

1. Press [F4] and [7] to display the Window Color Change menu.

```

----- Window Color Change -----
1: Window Color Setup
2: Default Color
-----
To change: ENTER  To quit: ESC

```

*Window color change menu*

2. Press the [1] key to select 1 Window Color Setup.

```

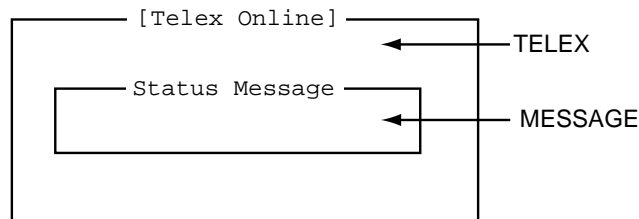
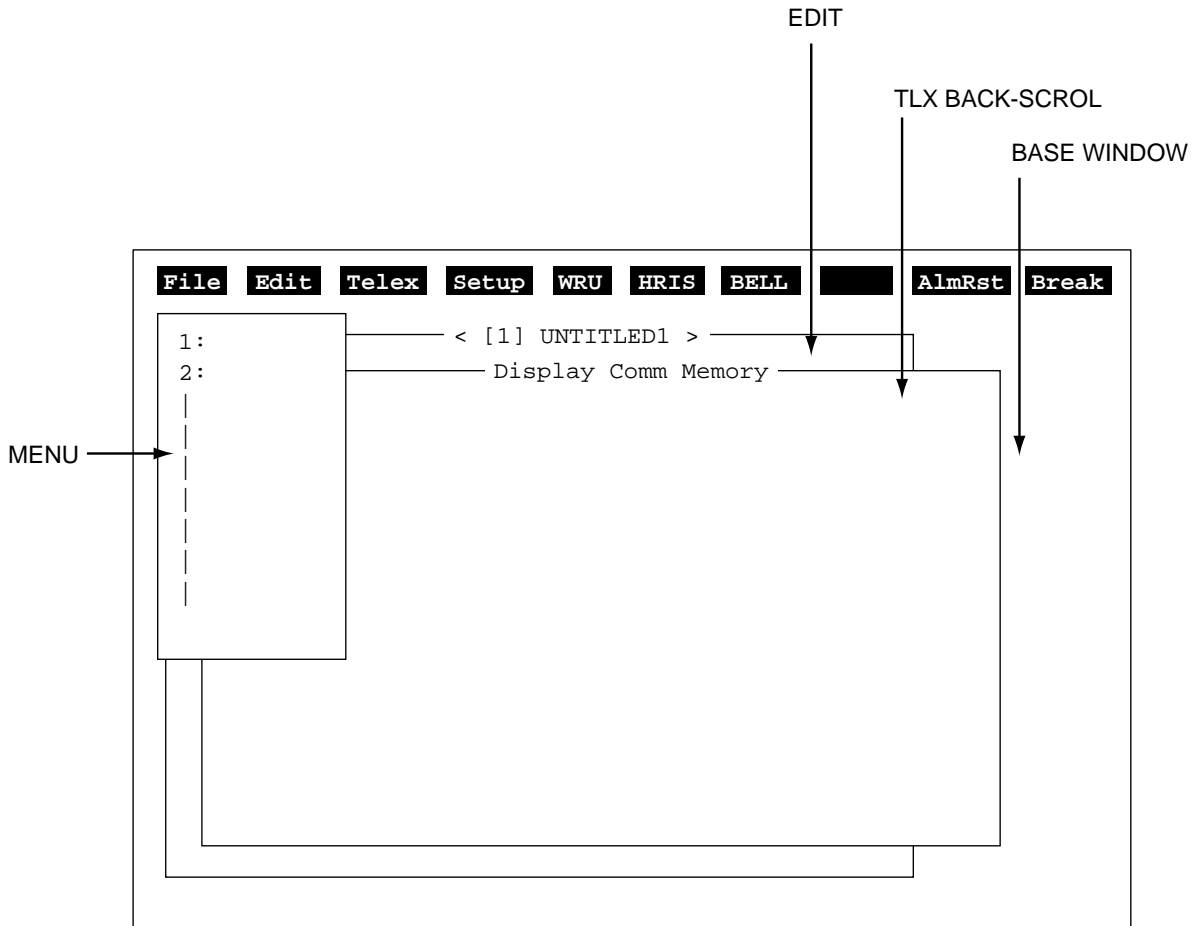
----- Window Color Setup -----
Window [ Base Window ]
Fore Color [ L-WHITE ]
Back Color [ BLUE ]
-----
To change: ENTER      To Change Value: L< = >R

```

*Window color setup menu*

3. Press [→] to select item to adjust.
  - BASE WINDOW: Standby display
  - TLX BACK SCROL: Communications memory display
  - TELEX: Communications display
  - EDIT1 – EDIT 2: Editor screens
  - FUNCTION: Function keys bar
  - SUB MENU1-SUB MENU 4: Sub menus
  - MESSAGE: Status message

## 2. SETTING UP



4. Press [ $\downarrow$ ] to select Fore Color.
5. Press [ $\rightarrow$ ] to select foreground color desired.
6. Press [ $\downarrow$ ] to select Back Color.
7. Press [ $\rightarrow$ ] to select background color desired.
8. Press the [Enter] key to register your selection.
9. Press the [Esc] key to return to the standby display.

To restore all default color settings, press [2] at step 2 in the above procedure to select "Default Color" and then press the [Enter] key.

**Note:** The same color cannot be selected for both background and foreground.

# 3. TELEX COMMUNICATIONS

## (Class 1 only)

---

### 3.1 Before Beginning Communications

#### 3.1.1 Overview

##### Telex communications methods

A telex message may be sent three ways:

- Auto telex (page 3-11)
- Manual telex (page 3-14)
- Programmed telex (page 3-18)

Before you can transmit a telex message automatically or by timer program you must first register the LES codes and telex numbers of stations you wish to call. This is also recommended for greater convenience on manual transmission. Further, you will need to prepare text messages.

##### Telex messages

Telex messages which you create may be stored on floppy disks. To send a telex message retrieve it from a floppy disk and then transmit it. For how to create a telex message see page 3-4.

### 3.1.2 Registering, deleting LES

#### Registering LES

246 LESs can be registered.

1. At the standby display, press [F4] and [2] to display the LES List.

LES List		
No. :	LES Code :	LES Name
001 :	:	████████████████████
002 :	:	
003 :	:	
⋮		
To print: CTRL+P    To edit: ENTER    To quit: ESC		

To print LES List. The display shown on the next page appears. Return to normal display.

*LES list*

2. Operate the arrow keys to select desired number from the LES List and press the [Enter] key. The LES List Edit display appears.

LES List Edit (No. 001)	
1: LES Access Code	: █
2: LES Name	: _____
3: Remarks	: _____
To delete this LES: BS                      To quit: ESC	

*LES list edit display*

3. Enter LES in three digits, referring to the LES list Appendix C. For example, enter 003 for the Yamaguchi, Japan LES. (To change LES code already entered, press the [Backspace] key successively, then enter LES code.)
4. Press the [↓] key to select LES Name.
5. Enter LES name (maximum 15 characters). For example, type YAMAGUCHI.
6. If desired, press the [↓] key to select Remarks and enter remarks (max. 25 characters).
7. Press the [Esc] key to return to the LES List display.
8. Press the [Esc] or [Enter] key to register and quit.

#### Deleting LESs

Delete LES name with [Backspace] key at step 3 in previous procedure and then press the [Enter] key.

### 3.1.3 Registering, deleting stations

#### Registering stations

You may register 64 stations.

- At the standby display, press [F4] and [1] to display the Station List.

```

      Station List
-----
No.  : Station Name
-----
01  : ████████████████████████████████████████
02  :
-----
08  :
-----
To print: CTRL+P  To edit: ENTER  To quit: ESC
    
```

*Station list*

- Operate the arrow keys to select empty station number and press the [Enter] key. The Station List Edit display appears.

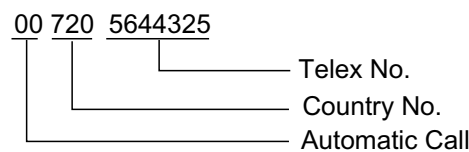
```

      Station List Edit (No.01)
-----
1: Stn. Name   █
2: Telex No.   : _____
3: Answerback : _____
4: Remarks    : _____
-----
To delete this stn: BS      To quit:ESC
    
```

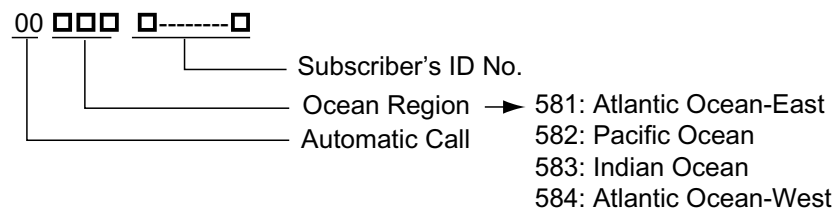
*Station list edit display*

- Enter station name. (To change station name already entered, press the [Backspace] key successively, then enter station name.)
- Press the [↓] key to select Telex No.
- Enter subscriber's telex number (max. 20 characters), referring to the examples shown in the figure below.

Example: MES to Land



Example: MES to MES



*Sample telex subscriber numbers*

- Press the [↓] key to select Answerback.

7. Enter answerback code (max. 20 characters). If you don't know the complete answerback code, enter a part of it or subscriber's telex number.

**Note:** The answerback code is used by the LES to verify identification in automatic and programmed telex. When a receiving station is called it sends the answerback code to the sending station and if it is different from what is registered here the line is disconnected. Answerback code is not applicable to manual telex. Further, if it is not entered messages may be garbled depending on the operator to which you are connected.

8. If desired, press the [↓] key and enter remarks (max. 25 characters).
9. Press the [Esc] or [Enter] key to finish.
10. Press the [Esc] key several times to return to the standby display.

### **Deleting stations**

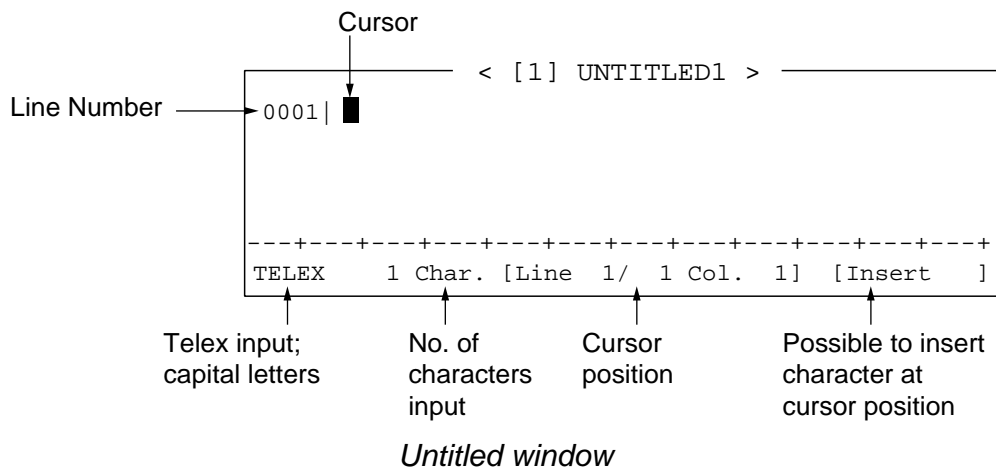
Delete station name with the [Backspace] key at step 3 in above procedure, and then press the [Enter] key.

## **3.1.4 Creating message files**

There are two types of telex messages: routine and confidential. This section shows how to create both, beginning with routine.

### **Creating routine message files**

At the standby display, press [F1] and [1] to select New Text. The display provides an untitled window for creating a message.



Type your message, in capital letters. #, &, \*, \$, and % cannot be used. At the end of the message type the characters NNNN (end of message code). To receive notice of call duration from the LES and have communication line disconnected automatically upon completion of the call, type five periods after NNNN. This feature is available regardless of message priority.

```

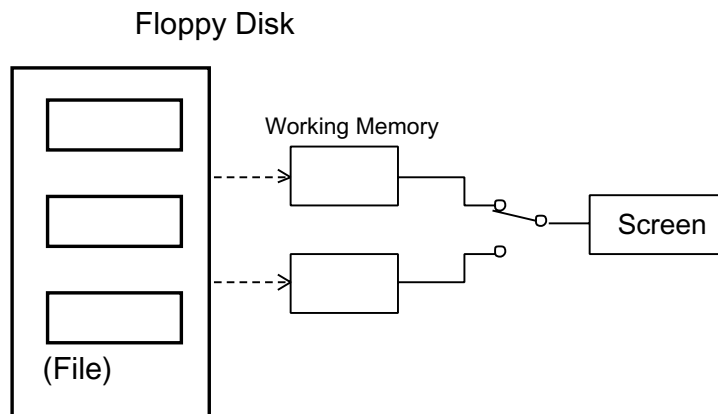
< [1] UNTITLED1 >
TO: FURUNO
ATTN: MARINE DEP.
FM: EUROPEAN VENTURE
REF: TLX00-001 AUG.10.00
SUBJECT: TEST MSG

TYPE YOUR MESSAGE HERE.
RGDS/MASTER
NNNN .....
    
```

*Example telex message*

Working memory

The FELCOM 82 has two working memories to which you can load a file.



*Working memory*

When you try to load a file into an occupied memory working memory, by pressing [F1] and [1] (New Text), the display asks you if you want to save (to a floppy disk) and clear the file currently loaded on the working memory before clearing the display.

```

Close Text
Save file?
(file name)
YES
NO
    
```

... This display asks you if you want to save current file before clearing the display.

*Close file prompt*

To save the file to a floppy disk, press the [Enter] key. To close the file without saving it, press [↓] to select "No" and press the [Enter] key.

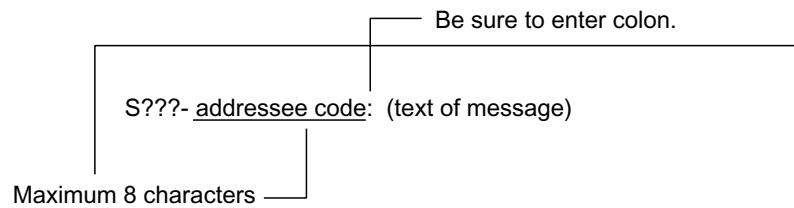
### 3. TELEX COMMUNICATIONS

#### **Confidential messages**

If communicating with a FELCOM 80/81/82, you can prepare a confidential message by entering S???-addressee code (-password): in the first line of the message text. You can also receive confidential messages containing this header from a land subscriber or any other MES.

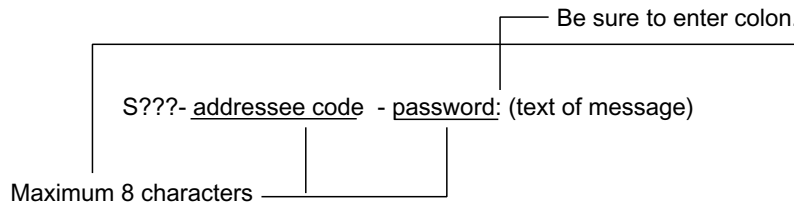
Confidential messages, unlike routine messages, are neither displayed nor printed when received. You will learn how to open and print confidential messages in a later section.

1. Press [F1] and [1] at the standby display to open the untitled window.
2. Prepare a confidential message referring to the figure below.



To prepare: Type S, 3 question marks, hyphen, addressee code, colon and text of message.

#### Confidential message with addressee code



To prepare: Type S, 3 question marks, hyphen, addressee code, hyphen, password, colon and text of message.

#### Confidential message with addressee code and password

*How to prepare a confidential message*



### 3.1.5 Saving message files

You can save message files to a floppy disk two ways:

- By “Save Text” (files remains on the display), or
- By “Close Text” (files is saved and display is cleared).

#### Formatting floppy disks

Before you can save a file to a floppy disk the disk must be formatted. Formatting prepares the disk for use with the system.

1. Insert blank floppy disk label side up in the disk drive on the terminal unit.
2. Press the [F1] key to show the File menu.
3. Press [9] to select Format Disk and press the [Enter] key.

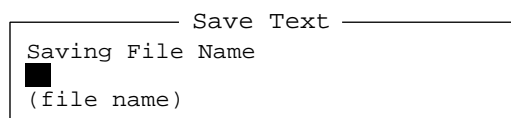


*Selecting disk type*

4. Select disk type, 1.44 KB for 2HD or 720 KB for 2DD, and press the [Enter] key.
5. You are asked if it is all right to format the disk. Select Yes and press the [Enter] key.
6. Press the [Enter] key again to format the disk.

#### Saving message file, retaining file on screen

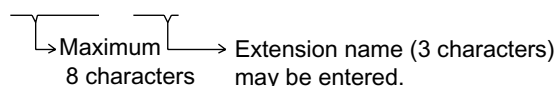
1. Press [F1] and [4] to select Save Text. The display should look something like the figure shown below. (If name is already entered, press the [Backspace] key successively to erase data.)



*Save file prompt*

2. Enter file name (max. eight characters plus three-character extension) and press the [Enter] key.

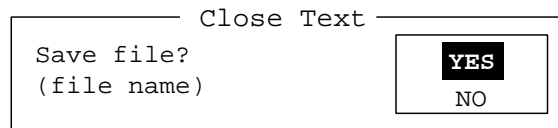
(ex.) FURUNO-1.TXT



*Sample file name*

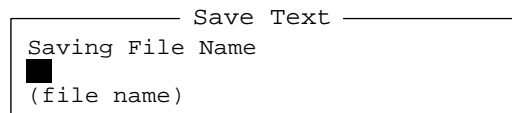
### **Saving message file, closing screen**

1. Press [F1] and [3] to select Close Text. The display should look something like the figure shown below.



*Close file prompt*

2. Press the [Enter] key.



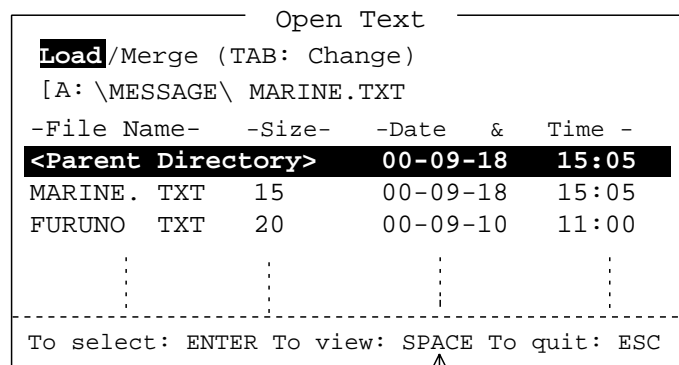
*Save file prompt*

3. Enter file name and press the [Enter] key. The message is saved and the screen is cleared.

### **3.1.6 Opening message files**

To open a message file from a floppy disk, do the following:

1. At the standby display, press [F1] and [2] to select Open Text. The display shows a list of files stored on the disk. (Note that the directory MESSAGE is automatically created when the a file is saved to a floppy disk.)



Press space bar to view first part of file.

*Open text display*

2. Select a file by operating the arrow keys and press the [Enter] key. (To view a portion of a file, tap the space bar.)
3. To open another file on a blank screen select it with the arrow keys and press the [Enter] key. To tack the file onto a file currently opened, use the [Tab] key to select Merge before pressing the [Enter] key. (The default option (Load) opens the file on a blank screen.)

**Load:** Open file on a blank screen.

**Merge:** Tack file at cursor location in file currently displayed.

4. Press the [Enter] key.

**Note:** If both working memories are occupied, the following display appears.

Close Text
Save file? (file name)
<div style="border: 1px solid black; padding: 2px; display: inline-block;"> <b>YES</b> NO         </div>

Save the file in one of the working memories by pressing the [Enter] key, or select "NO" and press the [Enter] key to clear the display without saving the file.

### 3.1.7 Other File menu operations

#### Deleting files from floppy disks

You can delete unnecessary files from a floppy disk as follows:

1. Press [F1] and [5] to select Delete File.
2. Press the arrow keys to select file to delete. (If you want to view the first part of the file, press the space bar.)
3. Press the [Enter] key. The display asks you if it is alright to delete the file.

Delete File: FURUNO
Delete OK?
<div style="border: 1px solid black; padding: 2px; display: inline-block;"> <b>YES</b> NO         </div>

*Delete file prompt*

4. Press the [Enter] key.

#### Changing file name

1. Press [F1] and [6] to select Rename File.
2. Press the arrow keys to select file then press the [Enter] key.

Old name: FURUNO.TXT
New name: ■
-----
TAB: Copy from old-name

Press Tab key to copy previous name.

*Display for entering new file name*

3. Enter new file name and press the [Enter] key.

#### Printing file contents

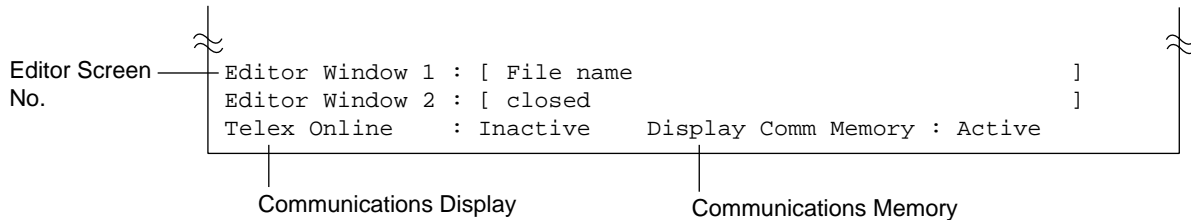
1. At the standby display, press [F1] and [7] to show file list.
2. Select file and press the [Enter] key.
3. Press the [Enter] key again to print.

### 3. TELEX COMMUNICATIONS

#### **Temporarily erasing displayed file (editor screen)**

You can show the standby display when the editor screen, communications display and communications memory are active.

1. Press [Alt] + [Z]. Opened communications display, communications memory are temporarily erased and the displays erased are shown at the bottom of the screen.



#### Communications Display

File Name: File name shown on the display  
closed: No file name shown on display

#### Communications Display, Communications Memory

Inactive: File name shown on the display  
Active: File temporarily erased

*Standby display, bottom of display*

2. To restore editor screen, communications display, communications memory, press [Alt] + [Z] again.

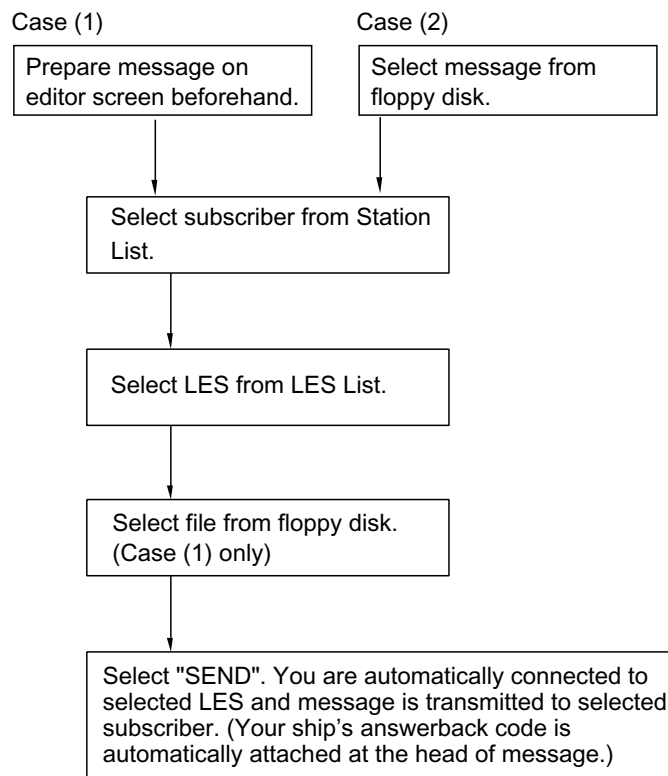
## 3.2 Automatic Telex

### 3.2.1 Automatic telex procedure overview

A telex message is automatically sent using pre-registered LES, station and subscriber number. Answerback codes are automatically exchanged between sender and receiver.

There are two ways to prepare a telex message for automatic transmission:

- (1) Select message from floppy disk
- (2) Prepare message on the editor screen



*Automatic telex overview*

### 3. TELEX COMMUNICATIONS

#### 3.2.2 Detailed procedure

1. At the standby display (or "Editor" screen), press [F3] and [1] to display the Auto Telex display.

Auto Telex

1: **Station Name** : \_\_\_\_\_  
    [ Telex No. : \_\_\_\_\_ ]

2: LES Access Code : \_\_\_\_ (    )

3: File to Send : \_\_\_\_\_

**SEND**

CANCEL

---

To open table: SPACE                      To quit: ESC

You can also open the Station Name list by pressing the space bar.      Press [Esc] to return to standby display.

#### *Auto telex display*

2. Press [1] or the space bar to display the Station List.

Station List

No. : Station Name

---

**01 : FURUNO**

02 : MARINE

...

08 :

---

To select: ENTER                      To quit: ESC

#### *Station list*

3. Operate arrow keys to select station and press the [Enter] key.
4. Press [2] to display the LES List.

LES List

No. :    LES Code :    LES Name

---

001 :    003        :    YAMAGUCHI

...

008 :                :

---

To select: ENTER                      To quit: ESC

#### *LES list*

5. Operate arrow keys to select LES and press the [Enter] key.
6. If you want to send the message currently displayed on the editor screen go to step 8. To send a file stored on a floppy disk, insert appropriate floppy disk in the disk drive on the terminal unit and press [3] to display the file list.
7. Operate the arrow keys to select file and press the [Enter] key.
8. Press the right arrow key to select "SEND".

**SEND**

CANCEL

.....> To transmit

.....> To escape

9. Press the [Enter] key to transmit, or select CANCEL and press the [Enter] key to cancel transmission.

You are automatically connected to the LES selected and your message is sent to station selected. After the message is transmitted, the line with the LES is automatically disconnected. If five periods are typed at the end of the message, notice of call duration appears prior to disconnection of the line.

**Note:** If the answerback code registered in the station list is different from what the receiving station sends to you communication is not possible. The line is then automatically disconnected.

#### **Disconnecting line with LES manually**

Press [F10] (Break). Notice of call duration does not appear.

#### **Returning to standby display**

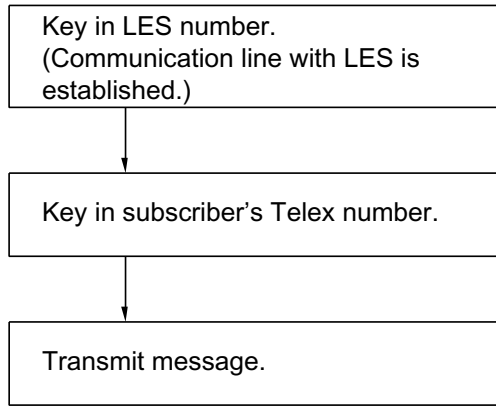
After the line with the LES is disconnected, press [Esc] key to return to the standby display, or [F3] and [8] (or [Alt] + [W]) to return the editor screen.

If you wish to connect newly the line with an LES, wait 30 seconds after the line has been disconnected, otherwise an error message appears, resulting in no connection.

### 3.3 Manual Telex

To transmit a telex message manually, the operator selects station, LES, subscriber number, and manually transmits answerback code.

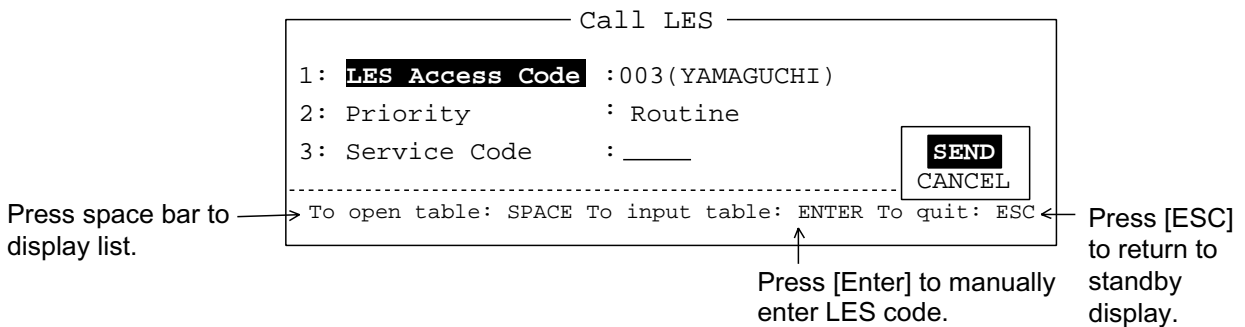
#### 3.3.1 Manual telex procedure overview



*Manual telex overview*

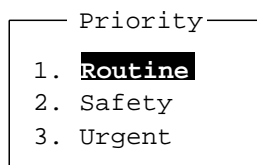
#### 3.3.2 Detailed procedure

1. At the standby display, press [F3] and [2] to display the Call LES display.



*Call LES display*

2. Select appropriate LES, automatically (a) or manually (b)
  - a) Key in LES number (if one is already entered used the [Backspace] key to delete it) and press the [Enter] key, or
  - b) Press the space bar to display the LES List. Operate the arrow keys to select LES and press the [Enter] key.
3. Press the [↓] key to select Priority.
4. Press the space bar.



*Priority display*



- Select communications priority by pressing appropriate numeric key among 1-3 (normally, press [1] for Routine) and press the [Enter] key.

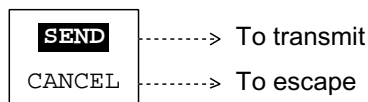
**Safety:** Communicating important meteorological or navigation warning.

**Urgent:** Communicating safety of ship or safety of person.

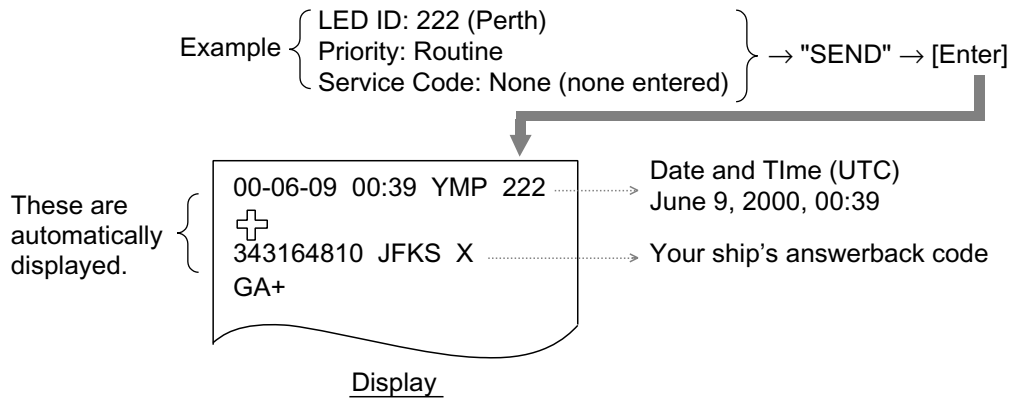
- If necessary, select service code, otherwise go to step 7. Set the cursor on Service Code and press the space bar. Then, key in service code in two digits and press the [Enter] key. Note that some services may not be available depending on LES.

Service Code	Function
00	Automatic call
11	International operator
12	Dialing guide
32	Medical advice
33	Technical assistance
38	Medical assistance

- Press the [→] key to select SEND.



- Press the [Enter] key. "GA+" (Go Ahead) should be displayed on your screen, meaning you are now connected with LES selected.



Sample manual telex message

### 3. TELEX COMMUNICATIONS

9. At the standby display, press [F3] and [3] to show the Call Station display.

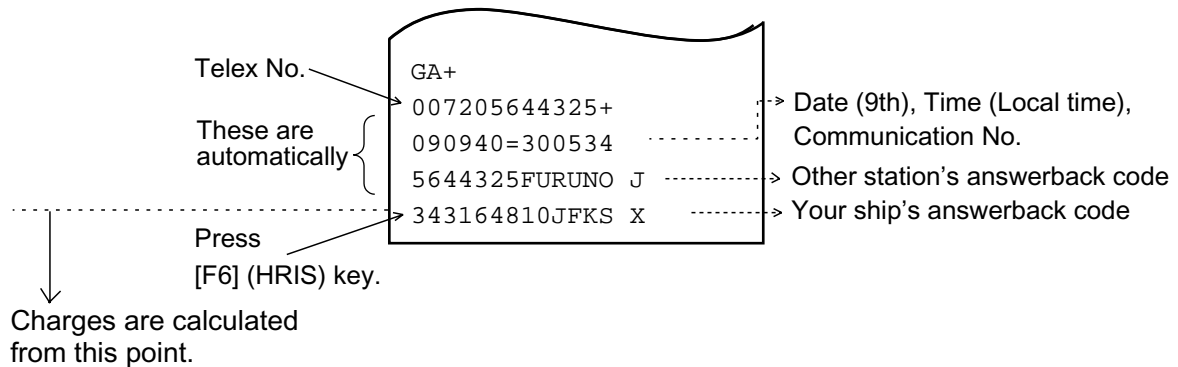
Call Station	
No.	Station Name
01	FURUNO
02	KOBE
⋮	⋮

#### Call station display

10. Operate the arrow keys to select station desired. Wait for "GA+" from LES.  
11. After "GA+" is displayed, press the [Enter] key. Selected station's telex number appears on the display as shown below. If the number is wrong, press [F10] to disconnect the line.

**Note:** You must enter subscriber's telex number within 15 seconds after "GA+" is displayed. Otherwise, the line with the LES is disconnected.

Example { 00: Automatic Connection  
720: Country Code (Japan)  
5644325: Subscriber No.  
+: End Code }



#### Sample manual telex message

12. After other station's answerback code appears on your display, press the [F6] (HRIS) key to send your ship's answerback code. (Charge calculation begins from when you send answerback code.) Prepare and transmit message right away as on the next page.

13. You may prepare a telex message two ways: Type message from keyboard or retrieve a file from floppy disk.

To retrieve file from floppy disk:

- a) Insert floppy disk in drive. At the standby display, press [F3] and [4] to display the Transmit File display.

Transmit File			
-File Name-	-Size-	-Date	& Time -
SAITO-1	<DIR>	00-09-18	15:05
⋮	⋮	⋮	⋮
⋮	⋮	⋮	⋮
⋮	⋮	⋮	⋮

*Transmit file display*

- b) Operate the arrow keep to select file. (To display the first part of the file, press the space bar.)
14. Press the [Enter] key to transmit the file. (Transmit messages appear at the bottom of the display.)

**Note 1:** The line can be manually disconnected with [F10].

**Note 2:** The line can be automatically disconnected by typing five periods at the end of the message.

**Returning to standby display**

After the line with the LES is disconnected, press [F3] and [8] (or Alt + W) to return to the standby display.

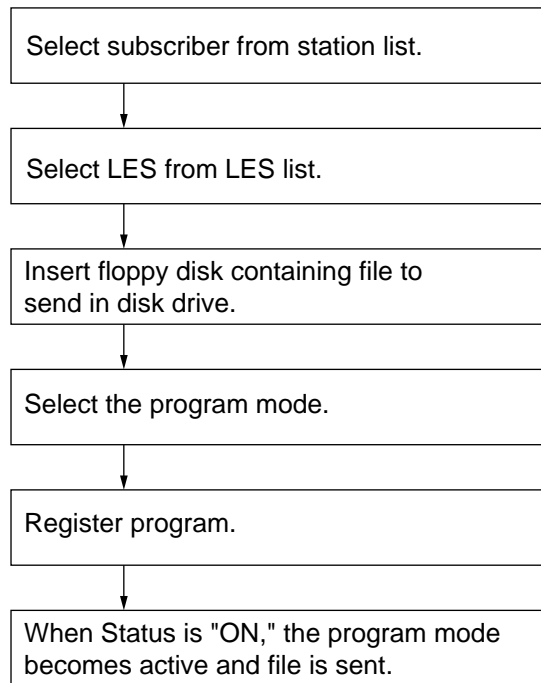
If you wish to connect newly the line with an LES, wait for 30 seconds after the line has been disconnected, otherwise an error message appears, resulting in no connection.

## 3.4 Programmed Telex

The FELCOM 82 can be programmed to automatically send a telex message at a specific time or at regular intervals. Eight such programs can be programmed.

You don't need to worry if the communication line is busy when the programmed time arrives: The FELCOM 82 waits for the line to become free and then automatically sends the message two minutes afterward.

### 3.4.1 Programmed telex overview



*Programmed telex overview*

### 3.4.2 Programming

1. Press [F3] and [5] to display the Program Telex display. If there are no programs entered, the display looks like the one shown below.

Program Telex

No.	LES	-Destination-	-Filename-	-Mode-	Status
01	<<No data >>				
02	<<No data >>				
...					
08	<<No data >>				

To change status:ENTER To edit:SPACE To quit:ESC

Press [Enter] key to  
enable or disable  
program selected.

Press Space bar to  
edit program selected.

Press [Esc] key to  
quit.

*Program telex display*

2. Select unused number and press the space bar to enter program data.

Edit (No.1)

1: **Station Name** : \_\_\_\_\_  
                   [Telex No. : \_\_\_\_\_ ]

2: LES Access Code: \_\_\_\_\_

3: File to Send : POSITION. RPT [default] ENTRY DELETE

4: Program Mode : \_\_\_\_\_ [ \_\_\_\_\_ ]

---

To open table: SPACE To quit: ESC

*Edit display for program telex*

3. Press [1] (or tap the space bar) to display the Station List.
4. Operate the arrow keys to select station desired and then press the [Enter] key. The Edit display appears.
5. Press [2] to show the LES list.
6. Operate the arrow keys to select LES desired and then press the [Enter] key.
7. Set appropriate floppy disk into the disk drive on the terminal unit. At the Edit display, press [3] to display the file list.

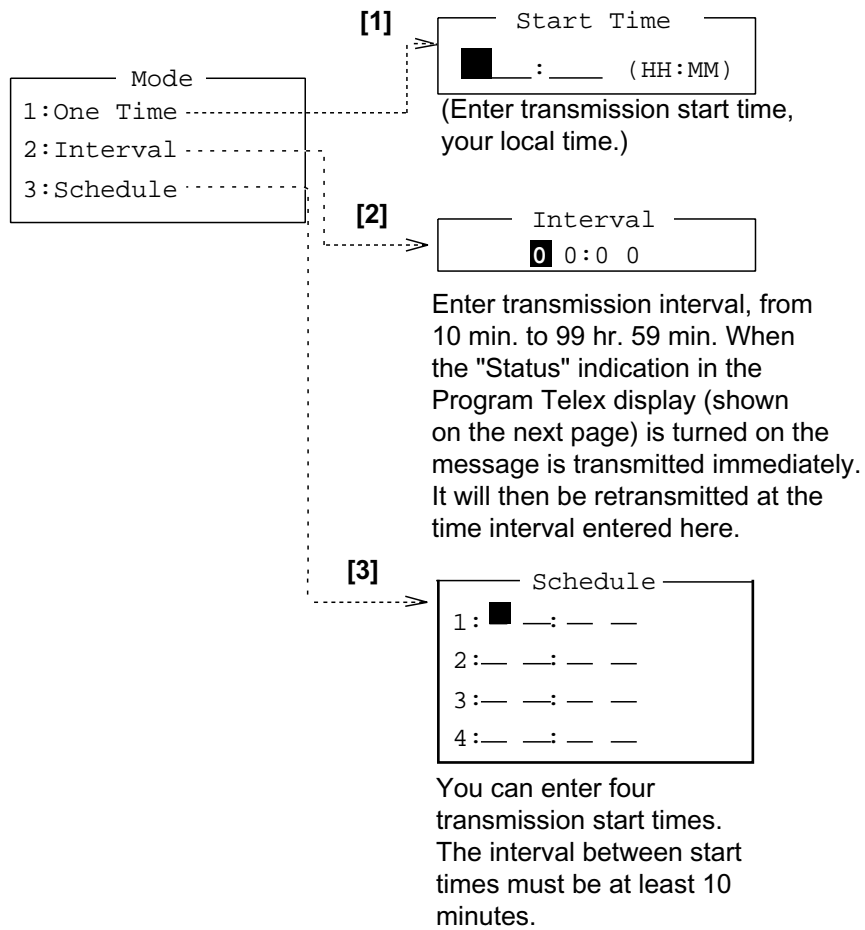
**Note:** If file is not specified, the file "POSITION.RPT" (ship's position) is automatically selected and sent when the time specified arrives.

LAT 32:08:35N  
LON 140:56:87E

*Sample position report file*

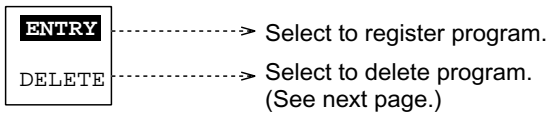
### 3. TELEX COMMUNICATIONS

8. Operate the arrow keys to select file desired and then press the [Enter] key.
9. Press [4] to select Program Mode. Select desired mode, enter transmission start and stop times (or transmission interval) and then press the [Enter] and [Esc] keys.

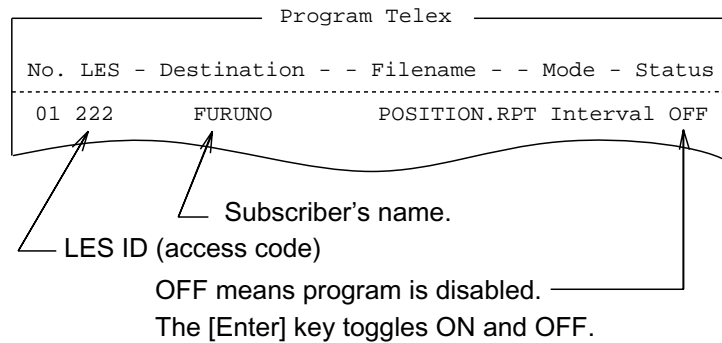


#### Mode menu

10. Press the [→] key to select "ENTRY".



11. Press the [Enter] key to register program. The display shows the particulars of the program registered.



*Sample program telex list*

12. To enable a program, press the [Enter] key. "ON" appears in the Status column. Transmission starts at the interval selected at step 9.
13. To return to the standby display, press the [Esc] key twice.

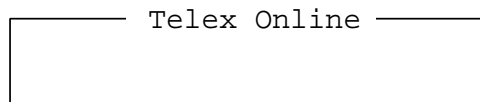
### 3.4.3 Deleting programs

1. At the standby display, press [F3] and [5] to select Program Telex.
2. Operate the arrow keys to select program to erase and then tap the space bar.
3. Press the [→] key and then press the [↓] key to select DELETE.
4. Press the [Enter] key to delete the program.
5. Press the [Esc] key to return to the standby display.

## 3.5 Receiving

### 3.5.1 Receiving routine messages

When you receive a routine telex message the audible alarm sounds. (The alarm does not sound when it is disabled at Incoming Call Alarm on the Terminal Setup menu ([F4], [3] and [6])). The message fills the "Telex Online" display shown below and is printed. You can silence the alarm by pressing [F9].



*Telex online display*

#### Retrieving routine messages

All received routine messages are stored in the communications memory (16K byte capacity). To retrieve a message from the communications memory, do the following:

1. Press the [B] key while pressing and holding down the [Alt] key.
2. You can scroll the screen by pressing and holding down the [Fn] key while pressing [↑] or [↓].

**Note:** When the terminal unit is turned off all contents of the communications memory (transmitted and received routine messages) are cleared. Therefore, you may wish to save or print out important messages. For how to print the communications memory see paragraph 3.8.5 on page 3-33.



### 3.5.2 Receiving confidential messages

When you receive a confidential message the audible alarm sounds and the display shows the message "Confidential message received". (The alarm does not sound when it is disabled at Incoming Call Alarm on the Terminal Setup menu ([F4], [3] and [6])). To silence the alarm, press [F9].

Confidential messages are neither displayed nor printed, however they are stored in the confidential message memory (capacity: 16K bytes). When this memory becomes full, the oldest confidential message is deleted to make room for the latest.

#### Retrieving confidential messages

1. At the standby display, press [F3] and [6] to select Confidential Msg.

Confidential Message

No.	Addressee-	-Prty-	-RX Time-	-Duration-	-Size
1	FURUNO	Rou	00-09-19 17:30	00:03'00	235
2*	SAITO	Rou	00-04-10 15:25	00:02'17	149
<<< End of Message >>>					
To print:CTRL+P		To view:ENTER		To delete:DEL	
			To quit:ESC		

Asterisk marks files with passwords.

Press [Ctrl] + [P] to print selected file.

Press [Enter] to view part of selected file.

Press [Delete] to delete selected file.

#### Confidential message list

2. Operate the arrow keys to select the message you want to retrieve. (Messages with a password are marked with an asterisk. Enter password. Password is not displayed during or after its entry.)

password: █ \_\_\_\_\_

#### Password input screen

3. Press the [Enter] key to retrieve the message.

### 3. TELEX COMMUNICATIONS

#### **Printing confidential messages**

1. Press [F3] and [6].
2. Operate the arrow keys to select file.
3. Press [Ctrl] + [P]. If the message contains a password enter it before pressing those keys.

#### **Deleting confidential messages**

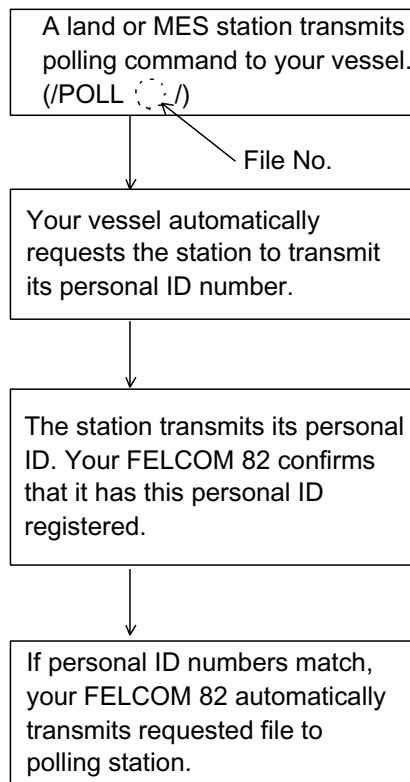
1. Press [F3] and [6].
2. Operate the arrow keys to select message to delete. Press the [Delete] key. (If the message contains a password, enter it before pressing the [Delete] key.)
3. Select YES and then press the [Enter] key.

## 3.6 Polling

Polling means one station (the polling station) interrogating another or others (the polled station or group of stations) for the purpose of receiving a message. The polling station may be a ship station (MES) or a shore subscriber, while the polled station is always an MES.

When a polled MES finds the polling command in the received message, it requests the station sending the polling command to transmit its ID number. In this way, the authenticity of the polling station is confirmed. The polled MES then responds automatically in a predetermined manner, either with a data reporting message or by initiating a ship-to-shore or ship-to-ship message transfer.

### 3.6.1 Polling procedure overview



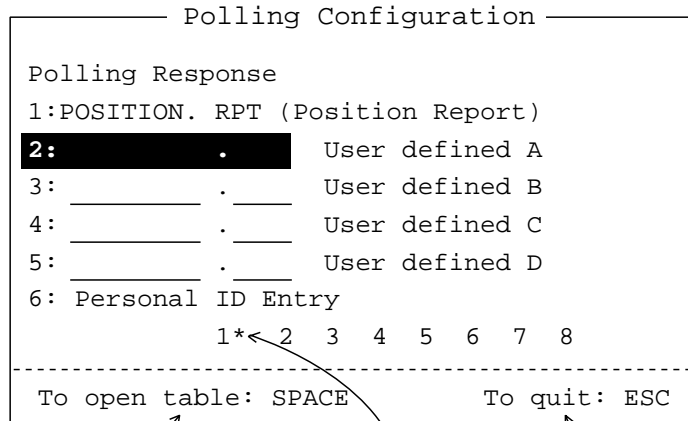
*Polling overview*

### 3.6.2 Polling setup

#### Entering personal ID number

A personal ID number is used to confirm identity in polling and consists of up to eight digits. Eight sets of IDs may be entered, corresponding to eight different stations. The ID number can be any combination of alphanumeric characters and should be agreed on by both the polled and polling station beforehand.

1. At the standby display, press [F4] and [5] to display the Polling Configuration display.



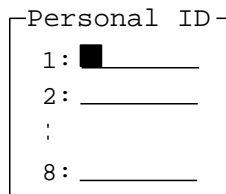
Press space bar to display file list.

Asterisk appears when ID is registered.

Press [Esc] to quit this display.

*Polling configuration display*

2. Press [6] to select Personal ID Entry.



*Personal ID window*

3. Use the arrow keys to select appropriate number.
4. Enter personal ID number (maximum eight characters) followed by the [Enter] key.

### **Selecting a polling response file**

1. At the standby display, press [F4] and [5] to display the Polling Configuration display.
2. Press one of the keys 2 to 5 to select polling response file number. (You can also select it by operating the arrow keys followed by the space bar.)
3. Operate the arrow keys to select file from a floppy disk. (To display the first part of the file, tap the space bar.)
4. Press the [Enter] key.
5. Press the [Esc] key to return to the standby display.

File number 1 is reserved for position information. When a subscriber requests this information, your position, input by navaid, is sent to the subscriber.

**Note:** To delete a polling response file, select it and press the [Delete] key.

### **3.6.3 Transmitting the polling command**

Your ship transmits the polling command to retrieve a file from other station (MES).

#### **Automatic transmission**

1. Input polling command and save it to a floppy disk.
  - a) Press [F1] and [1].
  - b) Type the polling command: /POLL [a file no. 1-5]/ at the beginning of the file. and save file to a floppy disk.
  - c) Save file to floppy disk.

#### **Manual transmission**

1. Connect with subscriber.
2. Type /POLL, file number (1-5) and /. Called station requests your personal ID.
3. Input your personal ID so the other station can transmit information requested.

## 3.7 Distress Communications

Transmit the distress alert only in a life endangering situation. If the navigator is not outputting data, enter position and heading manually as shown on page 2-17 and page 2-18.

### 3.7.1 Transmitting the distress alert

1. Open the distress button cover on the IB-352.
2. Press and hold down the [DISTRESS] button **six seconds**.

### 3.7.2 Distress communications

You are automatically connected to an LES. If you are not pressed for time, you may send a telex message to the LES by direct keyboard input.

### 3.7.3 Distress alert transmission when you are not pressed for time

If you are not pressed for time you may specify the nature of distress from the handset as follows, before transmitting the distress alert.

1. Press [FUNC Quit], [5], [8] and [3].
2. Press [3] to select Nature of Distress.
3. Hit numeric key corresponding to nature of distress.

1: Fire, Explosion	6: Sinking
2: Flooding	7: Disabled & Adrift
3: Collision	8: Undesignated
4: Grounding	9: Abandoning
5: Listing	
4. Press the [DISTRESS] button six seconds to transmit the distress alert.

## 3.8 Editing, Printing Text

This section discusses how to edit and print text.

### 3.8.1 Displaying the Edit menu

The Edit menu, displayed by pressing [F2], is where you begin all text editing operations.

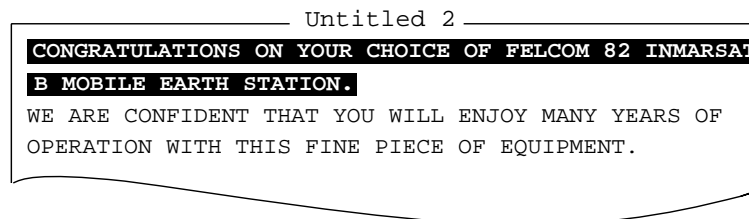
1: Undo	ALT+X
2: Cut	DEL
3: Copy	ALT+C
4: Paste	INS
5: Select All	ALT+A
6: Search	ALT+F
7: Replace	ALT+R
8: Goto Top	HOME
9: Goto Bottom	END
A: Goto Line	ALT+L
B: Change Text	ALT+V

*Edit menu*

### 3.8.2 Cutting, pasting text

#### Cutting text

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 (or [↓] key). If you highlight text which you do not want to cut, press the [←] key to adjust the highlight.



*Message with text highlighted*

3. Press [F2] and [2]. 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 from the Edit menu.

### 3. TELEX COMMUNICATIONS

#### **Pasting text**

To paste the cut text to a new location:

1. Place the cursor at the exact spot in the message where the cut text is to start.
2. Press [F2] and [4] (or the [Ins] key).

#### **3.8.3 Copying and pasting text**

You may copy a portion of text and paste it elsewhere as follows:

1. Select the text to copy.
2. Press [F2] and [3] (or [Alt] and [C]). The text selected is copied in the paste buffer memory. Control is returned to the standby screen.
3. Place the cursor at the exact spot in the message where the copied text is to start.
4. Press [F2] and [4] (or the [Ins] key).

#### **3.8.4 Other edit features**

##### **Undoing text**

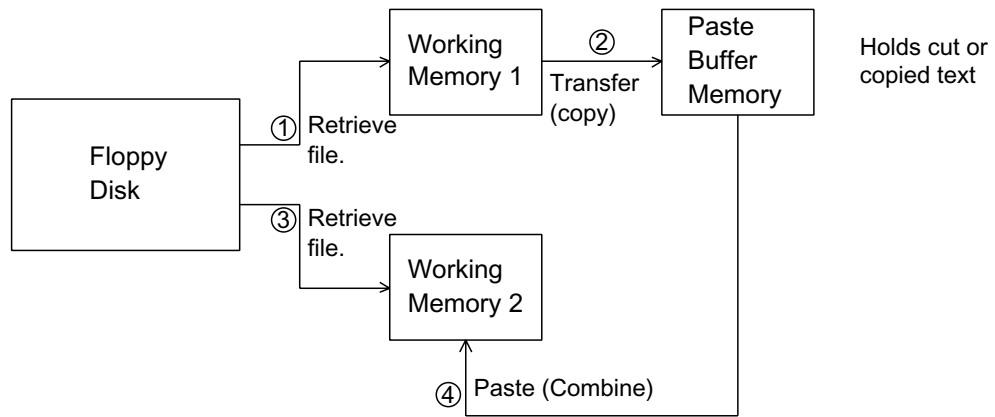
Use the Undo feature to return the file to its most recent state. For example, you have cut text but want to restore it. Then, you would select Undo in the Edit menu to restore the text to its most recent location. (Note that [Alt] + [X] are shortcut keys for the Undo function.)

##### **Selecting all text**

The Select All feature lets you select an entire file. This feature can be useful when you want to combine files. The procedure below explains how to tack the file loaded in working memory 1 onto the end of the file loaded in working memory 2.

1. Load floppy disk which contains file to copy. Suppose it is loaded in working memory 1.
2. Press [F2] and [5] (or [Alt] + [A]). The entire file appears in inverse video.
3. Press [F2] and [3] (or [Alt] + [C]). The file is placed in the paste buffer memory.
4. Load another file in working memory 2.
5. Place the cursor at the exact spot in the message where the text now in the paste buffer memory is to start and press the [F2] and [4].



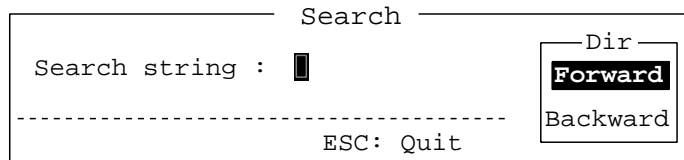


Sequence for combining files

**Searching text**

The Search feature lets you search for text in a forward or backward direction.

1. Display text and press [F2] and [6] (or [Alt] + [F]) to show the Search window.



Search window

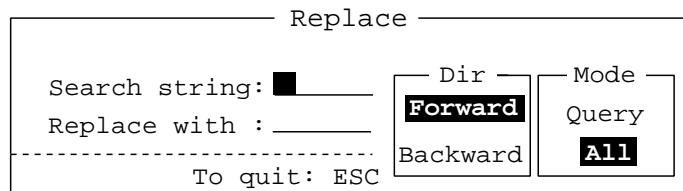
2. Type the word you want to find. Select Forward or Backward to search the file in a forward or backward direction respectively from the cursor position. Press the [Enter] key to begin the search.

When the word is found, the cursor stops at the first character of the word. 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.

1. Press [F2] and [7] (or [Alt] + [R]) to show the Replace window.



Replace window

2. Type the word you want to replace on the "Search string" line.
3. Press the [↓] key to select "Replace with." Type the new word.
4. Select Forward or Backward to search the file in a forward or backward direction respectively from the cursor position.

### 3. TELEX COMMUNICATIONS

5. Select whether you want to be queried or not each time the word is found.

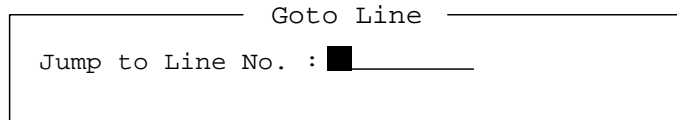
**Query:** Stop at each occurrence of word to answer yes or no to replacement.

**All:** Replace every occurrence of word without stopping to confirm.

6. Press the [Enter] key to start the replacement.

#### **Going to a specific line of text**

This feature places the cursor at the head of a line desired. Press [F2] and [A] (or [Alt] + [L]) to select Goto Line.



```
      Goto Line
-----
Jump to Line No. : █
```

*Goto line window*

Key in line number and press the [Enter] key. The cursor shifts to the head of the line selected.

#### **Going to top of text**

Press [F2] and [8] to go to the top of a text message. Note that this can also be done with the [Home] key.

#### **Going to bottom of text**

Press [F2] and [9] to go to the bottom of a text message. Note that this can also be done with the [End] key.

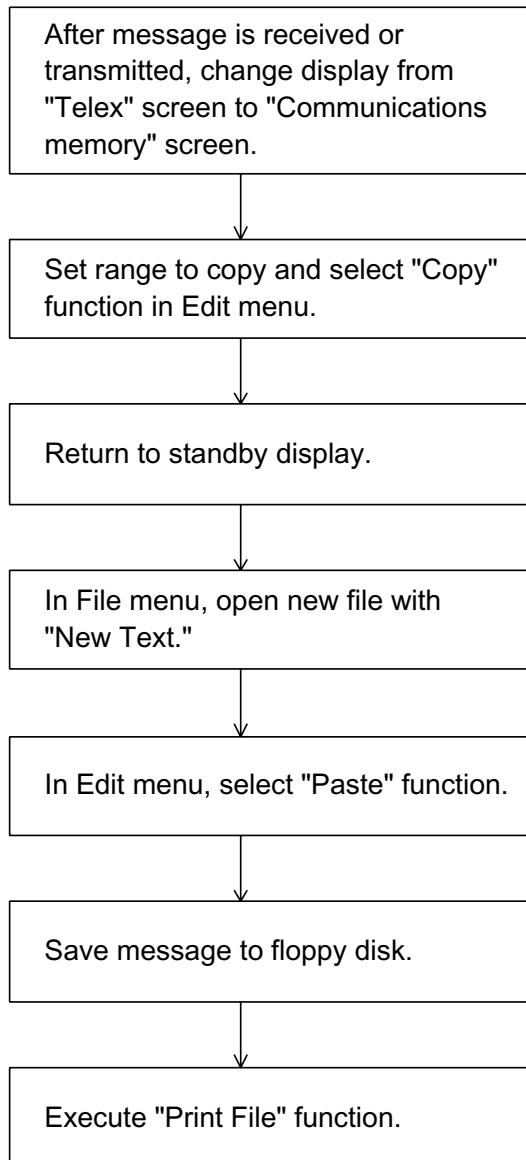
#### **Switching between two text windows**

Press [F2] and [B] (or Alt + V) to switch between text windows.

### 3.8.5 Printing messages

All transmitted and received routine messages are stored in the communications memory (capacity 16K bytes). Note that the contents of the communications memory are cleared when the terminal unit is turned off.

#### Message printing procedure overview



*Message printing procedure overview*

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#### **Detailed message printing procedure**

1. After a message is received (or transmitted), press [B] while pressing and holding down [Alt] to change the display from "Telex" screen to "Communications memory" screen.
2. Place the cursor on the first character of the text to copy and highlight the text to copy by pressing and holding down [Shift] while pressing [→] (or [↓]).

```
THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG 1234567890
THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG 1234567890
THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG 1234567890
      |
      |
      |
```

*File in communications memory*

3. Press [F2] and [3] (Copy). ("Cut" function not available.)
4. Return to standby display by pressing [B] while pressing and holding down [Alt].
5. Press [F1] and [1] (New). The untitled window display appears.
6. Press [F2] and [4] (Paste). The copy text selected in step 3 is pasted in the untitled window.
7. Press [F1] and [4] (Save Text).
8. To save, enter file name and press [Enter].
9. Press [F1] and [7] (Print File). The display shows a list of files stored on the disk.
10. Select file to print with the arrow keys and press [Enter]. To stop printing, press [Esc].

## 3.9 Main Menu Description

This paragraph provides descriptions for each menu.

### **[F1] File menu**

The File menu is where you will create, name and save messages (to floppy disk). You can also print messages from this menu.

1: New Text	ALT+N
2: Open Text	ALT+O
3: Close Text	ALT+Q
4: Save Text	ALT+S
-----	
5: Delete File	ALT+D
6: Rename File	
7: Print File	ALT+P
-----	
8: Clear Comm Memory	
-----	
9: Format Disk	

#### *File menu*

- 1: New Text:** Opens new file in a working area.
- 2: Open Text:** Opens file from a floppy disk.
- 3: Close Text:** Removes file from a working area.
- 4: Save Text:** Saves file to a floppy disk.
- 5: Delete File:** Deletes file from floppy disk.
- 6: Rename File:** Changes file name.
- 7: Print File:** Prints file in a floppy disk.
- 8: Clear Comm Memory:** Clears all transmitted and received routine messages from communications memory.
- 9: Format Disk:** Formats disk for use in system.

### 3. TELEX COMMUNICATIONS

#### **[F2] Edit menu**

The Edit menu provides text editing facilities, and it may be used when a text window is open.

1: Undo	ALT+X
2: Cut	DEL
3: Copy	ALT+C
4: Paste	INS
5: Select All	ALT+A
6: Search	ALT+F
7: Replace	ALT+R
8: Goto Top	HOME
9: Goto Bottom	END
A: Goto Line	ALT+L
B: Change Text	ALT+V

#### *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.
- 3: Copy:** Copies the selected text and stores it in the paste buffer.
- 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 specified word.
- 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 the last line of the current file.
- A: Goto Line:** Moves the cursor to the desired line in the current file.
- B: Change Text:** Alternately displays two open files.

**[F3] Telex menu**

The Telex menu is where you begin all phases of telex communication.

1: Auto Telex	ALT+T
2: Call LES	
3: Call Station	
4: Transmit File	
5: Program Telex	
6: Confidential Msg	
7: Communication Log	
8: Change Window	ALT+W

*Telex menu*

- 1: Auto Telex:** Automatic telex transmission.
- 2: Call LES:** Manually connects communication line with LES.
- 3: Call Station:** Selects a station from the Station List or enters telex number directly through keyboard.
- 4: Transmit File:** Selects file to transmit.
- 5: Program Telex:** Programmed telex.
- 6: Confidential Msg:** Opens confidential messages.
- 7: Communication Log:** Stores routine received messages, and destination, call duration, date and time of all transmitted routine messages. The log holds 25 messages. When the log is full, the oldest message is deleted to make room for the latest. You can also print messages from this menu.
- 8: Change Window:** Switches between editor screen and standby display. For example, you are editing a message and a message arrives. The display changes to the communication display, however if you want to continue editing the message while receiving, select this menu item.

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#### **[F4] Setup menu**

The Setup menu is where you enter your initial settings, including often-used stations and LES.

1: Station List
2: LES List
3: Terminal Setup
4: Editor Setup
5: Polling Configuration
6: Comm Unit Setup
7: Window Color

#### *Setup menu*

- |                                  |   |
|----------------------------------|---|
| <b>1: Station List:</b>          | Registers receiving station. 64 stations may be registered.   |
| <b>2: LES List:</b>              | Registers LES. 246 LESs may be registered.  |
| <b>3: Terminal Setup:</b>        | Sets up the terminal unit.  |
| <b>4: Editor Setup:</b>          | Formats editor screen.  |
| <b>5: Polling Configuration:</b> | Selects the file to transmit when the FELCOM 82 is interrogated.  |
| <b>6: Comm Unit Setup:</b>       | Sets up the communication unit with ocean region, navarea, etc. These menu items are common to both the communication unit and handset. |
| <b>7: Window Color:</b>          | Selects terminal unit display colors.   |

#### **[F5] WRU**

Requests other station's answerback code (Who are You?). (The mark "⊕" is displayed and printed.)

#### **[F6] HRIS**

Transmits your ship's answerback code (Who are You?).

#### **[F7] BELL**

Sounds bell at receiving station.

#### **[F8] (Not used)**

#### **[F9] Alm Rst**

Silences audible alarm which sounds when a message is received.

#### **[F10] Break**

Disconnects the communication line manually.



## 3.10 Keyboard Shortcuts

### 3.10.1 [Alt] key

You can control many of the FELCOM 82's functions directly from the keyboard with the [Alt] key as shown in the table below.

*Shortcuts with the [Alt] key*

Key	Function
Alt + N	Same as New Text in File menu.
Alt + O	Same as Open Text in File menu.
Alt + Q	Same as Close Text in File menu.
Alt + S	Same as Save Text in File menu.
Alt + D	Same as Delete File in File menu.
Alt + P	Same as Print File in File menu.
Alt + X	Same as Undo in Edit menu.
Delete	Same as Cut in Edit menu.
Alt + C	Same as Copy in Edit menu.
Insert	Same as Paste in Edit menu.
Alt + A	Same as Select All in Edit menu.
Alt + F	Same as Search in Edit menu.
Alt + R	Same as Replace in Edit menu.
HOME	Same as Goto Top in Edit menu.
END	Same as Goto Bottom in Edit menu.
Alt + L	Same as Goto Line in Edit menu.
Alt + V	Same as Change Text in Edit menu.
Alt + B	Shows communications memory display, where transmitted and received messages are stored. Repeat to go to standby display.
Alt + T	Same as Auto Telex in Telex menu.
Alt + W	Same as Change Window in Telex menu.
Alt + Z	Escape from editor screen or telex screen to "system status display." Repeat to return to previous screen.

**3.10.2 [Ctrl] key**

The [Ctrl] key provides the shortcut key operations shown in the table below.

*Shortcuts with the [Ctrl] key*

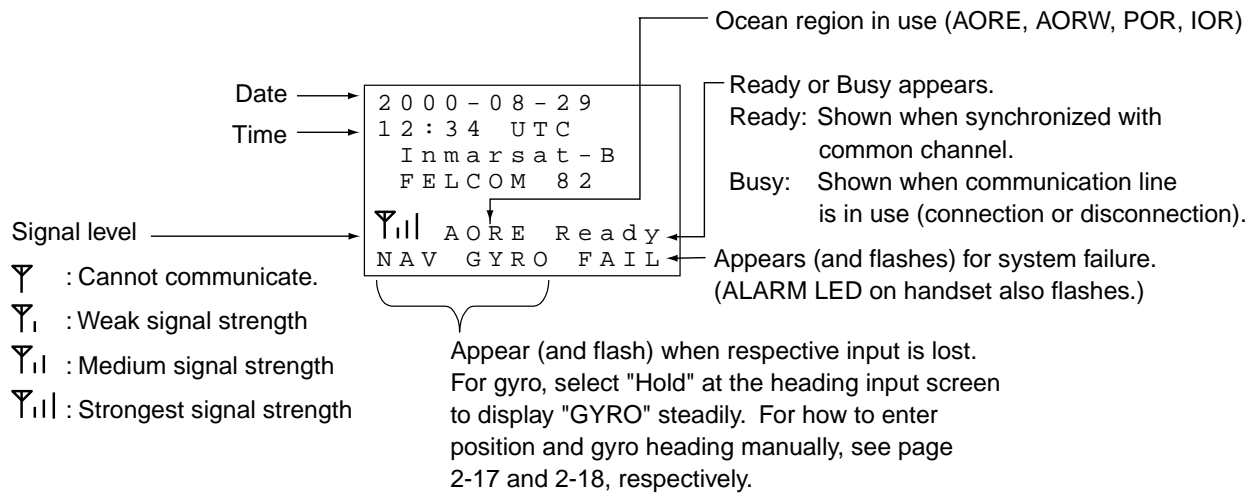
<b>Key</b>	<b>Function</b>
Ctrl + E	Same as [↑] key.
Ctrl + X	Same as [↓] key.
Ctrl + S	Same as [←] key.
Ctrl + D	Same as [→] key.
Ctrl + A	Moves cursor one character leftward.
Ctrl + F	Moves cursor one character rightward.
Ctrl + G	Same as [Delete] key.
Ctrl + H	Same as [Backspace] key.
Ctrl + I	Same as [Tab] key.
Ctrl + M	Same as [Enter] key.
Ctrl + C	Same as [Pg Dn] key.
Ctrl + R	Same as [Pg Up] key.
Ctrl + Z	Scrolls screen one line downward.
Ctrl + W	Scrolls screen one line upward.
Ctrl + [	Same as [Esc] key.
Ctrl + V	Same as Edit Mode in Editor Setup menu in Setup menu.
Ctrl + P	Prints current screen.

# 4. HANDSET COMMUNICATIONS

This chapter covers handset communications, using the Handset IB-882/IB-882-362. The handset functions to make calls to shore and other ships. It also functions to set up the Class 1 system.

## 4.1 Standby Display

The standby display appears about three seconds after turning on the communication unit. This is where you begin all handset operations.

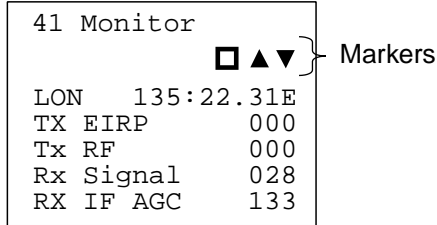


*Standby display*

## 4.2 Display Markers; How to Enter Data, Symbols

### Markers

A square and/or triangle(s) appear at the top right corner of relevant displays. They indicate what action can be taken on the current screen.

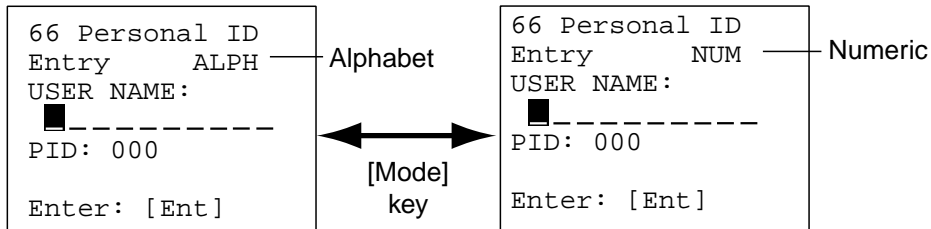


- : Current screen can be printed (with the [Print] key).
- ▼: Continues on next page. Use the [Down Arrow] key to scroll the screen down.
- ▲: Continued from previous page. Use the [Up Arrow] key to scroll the screen up.

### How to Enter Alphanumeric Data, Symbols

#### Alphanumeric data

You enter alphabet with the keys 2-9 and numerics with the keys 0-9. To switch between alphabet and numeric press the [Mode] key. The display shows NUM or ALPH at the top right corner of the display with each press of the [Mode] key.



To switch between upper and lower case alphabet, first display ALPH and then press appropriate alphabet key to display alphabet and case desired. For example, each press of the [ABC] key changes the alphabet and alphabet case in the sequence shown below.

→ A → B → C → a → b → c

#### Symbols

Use the [Symb] key to input symbols shown below on menus. Each press of the key selects a symbol in the sequence shown. Do not use the [#] and [\*] keys to input corresponding symbol; since they function as the end code and prefix code canceller, respectively.

```

[.]→[-]→[ _]→[*]→[#]→[()]
[]→[<]→[>]→[ ]→[ ]
{[]→[]}→[=]→[/]→[!]>[?]
[:]→[;]→[[]→["]→[@]→[-]
[+]→[.]→[ ^]→[$]→[¥]→[%]→[']
    
```

#### Selecting where to input data

Use the arrow keys.

## 4.3 Calling

The Inmarsat-B system provides telephone services for both land and maritime subscribers.

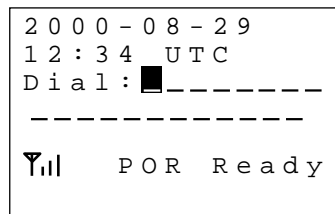
### 4.3.1 General calling procedure

There are two methods by which to make a call: direct dial or dial after pressing the [☎] key.

**Note:** If you using a prefix dial number see paragraph 4.3.2. Further, for dialing using a personal ID see paragraph 4.3.3.

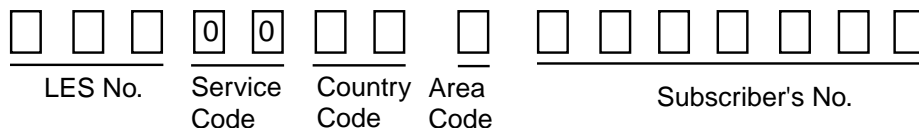
#### Direct dialing

1. Confirm that the signal strength indicator is showing at least one vertical bar and the indication “Ready” is displayed.
2. Pick up the handset and dial number, referring to the examples below, within 20 seconds of picking up the handset.



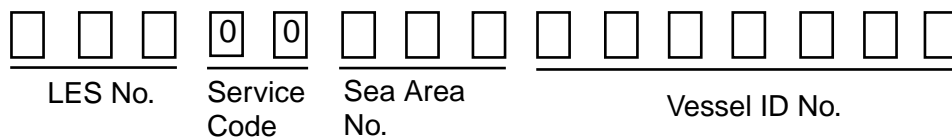
“Dial” display

#### Dialing procedure for calling land subscriber



LES No. = See Appendix C.  
Country Code = See Appendix B.

#### Dialing procedure for calling MES

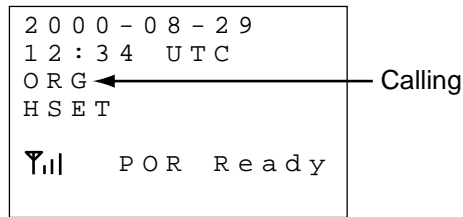


Sea Area	871 Atlantic Ocean-East 872 Pacific Ocean 873 Indian Ocean 874 Atlantic Ocean-West
----------	---

**Note:** If you misdial press the [☎] key and then redial.

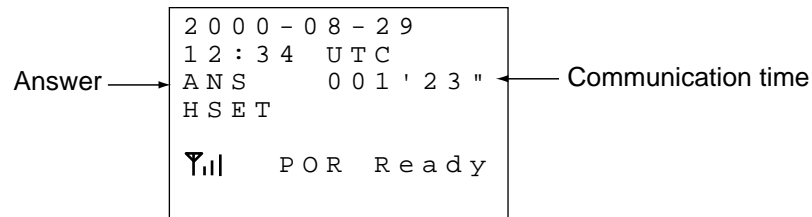
## 4. HANDSET COMMUNICATIONS

3. Press the [📞] key to call. The following display appears during calling.



*"Call" display*

4. When subscriber answers begin communications.



*"Answer" display*

5. You may adjust the volume of the earpiece by pressing the [⏮] or [⏭] key.  
 6. Press the [📞] key to finish communications.  
 7. Hang up the handset.

**Note 1:** The standby display automatically appears 20 seconds after hanging up the handset.

**Note 2:** Wait at least 30 seconds between communications. Otherwise, an error message is displayed and no communications can be made.

**Note 3:** If, for some reason, an LES cannot be reached the tone sounds in the handset to denote reason. Further, the reason is printed out.

### LES status and tone interval

Reason	Tone Interval
Busy	
Congestion	
No Service	

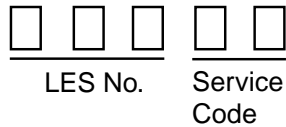
**Note 4:** Below are commonly available services and service codes.

Service code and service

Service Code	Service
00	Automatic Call
11	International Operator
12	Information
32	Medical Advice
33	Technical Assistance
34	Person-to-person Call
35	Collect Call
36	Credit Card Call
37	Time And Charges Call
38	Medical Assistance

Operator-assisted call

1. Dial the following:



11: International Call  
34: Person-to-person Call  
35: Collect Call

2. When the operator answers give the following:

- a) your ship's name or MES ID
- b) whether the call is operator-assisted or collect call (national, area code or Maritime Country Code)
- c) For person-to-person call, name of subscriber

**Note:** If you are connected to a wrong subscriber, hang up the handset, re-call the operator and request reconnection.

**Dialing by first pressing the [☎] key**

1. Confirm that the signal strength indication is showing at least one vertical bar and the indication “Ready” is displayed.
2. Pick up the handset and press the [☎] key. The “dial” display appears. (See page 4-3.)
3. Dial subscriber’s complete number.

**Note:** If you misdial, press the [☎] key. Press the [☎] key again and then dial number. Further, dial each digit within five seconds of the previous digit, otherwise the call will be canceled.

4. Press the [#] (end code) key. The “calling” display appears. (See page 4-4.) The remaining procedure is the same as from step 4 in “Direct dialing” on page 4-3.

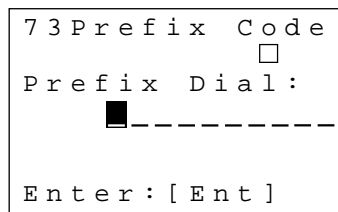
**4.3.2 Dialing prefix number**

You may wish to automatically enter a prefix code anytime the handset is picked up or the [☎] key is pressed. This is useful for automatically dialing a part of an often-called number.

**Registering prefix dialing number**

The prefix dialing number is useful for dialing parts of often-called numbers such as an LES area or service code. This function is done from the Administration mode. See page 2-10 for how to choose the Administration mode.

1. Press [FUNC Quit], [7] and [3] to display the Prefix Code input screen.



*Prefix code input screen*

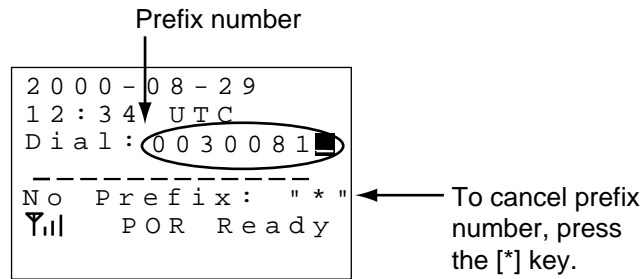
2. Enter prefix number (max. 10 digits), considering where you dial the most. For example, enter 00300813 (003, KDDI, 00: Automatic call, 81, Japan, 3, Tokyo) if most of your calls go to Tokyo.
3. Press the [Ent] key.
4. Press the [FUNC Quit] key to close the menu.

To delete the prefix number, hit the [DEL Prty] key at step 2.



**Dialing the prefix number**

1. Confirm that the signal strength indication is showing at least one vertical bar and the indication "Ready" is displayed.
2. Pickup the handset and press the [📞] key. If the prefix number is 00300813, for example, the display appears as below.

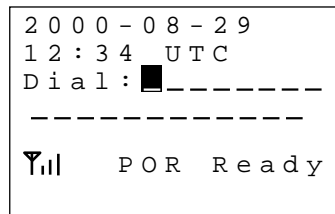


*Prefix number (00300813)*

3. Dial subscriber's complete number, excluding any portion already dialed with the prefix dialing number.
4. Press the [#] key. The "call" display appears. (See page 4-4.)

**Dialing with no prefix number**

1. Confirm that the signal strength indication is showing at least one vertical bar and the indication "Ready" is displayed.
2. Pickup the handset and press the [📞] key.
3. Press the [\*] key to release the prefix dialing number.




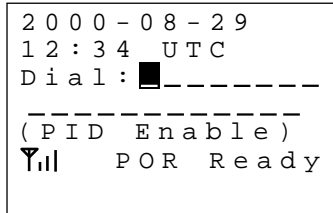
*"Dialing" display*

4. Dial subscriber's complete number.
5. Press the [#] key. The "calling" display appears. (See page 4-4.)

### 4.3.3 Calling when personal ID is in effect

Personal IDs may be registered to control handset usage and monitor toll charges. Using personal IDs you can know who uses telephones or facsimiles and when. For how to register personal IDs see paragraph 4.13 Personal ID Number.

1. Confirm that the signal strength indicator is showing at least one vertical bar and that the indication "Ready" is displayed.
2. Pick up the handset and press the  key.



*Dial display, PID enabled*

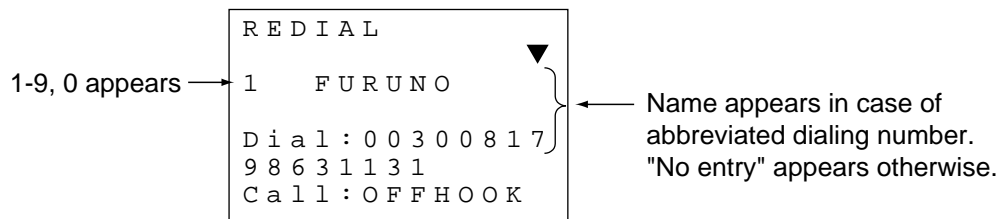
3. Enter three-digit personal ID number. (Do this before selecting priority and after the prefix dialing number appears.)
4. Enter subscriber's complete number.
5. Press the [#] key.

## 4.4 Redialing

The redial feature automatically redials a previously dialed telephone number. The latest 10 dialed telephone numbers are stored in the memory, and they are numbered 0-9, 1 the latest dialed number and 0 the oldest dialed number. Each time the redial feature is used the oldest dialed number stored in the memory is erased. Like numbers are not stored.

**Note:** The handset records telephone numbers entered with the numeric keys. Therefore, if you change the prefix dial code after making a telephone call, the same telephone number cannot be redialed. For further information about prefix dialing see page 4-6.

1. Confirm that the signal strength indicator is showing at least one vertical bar and that the indication "Ready" is displayed.
2. Press the [REDIAL] key. The display should look something like the one below. If there are no numbers stored only the message "No Data" appears.



**Note:** \* at the head of the tel. no. means prefix dial number not used when dialing.

### *Redial display*

3. Use the [↵] or [≡] key or numeric keys to select redial number.
 

**Note:** If you used the numeric keys to select a number omit step 4.
4. Press the [📞] key to redial number selected.

## 4.5 Receiving

Receiving a telephone call in the Inmarsat system is exactly the same as with a conventional telephone: simply pick up the handset and listen to the party. When a call is received the display looks something like the one below.

```

2 0 0 0 - 0 8 - 2 9
1 2 : 3 4   J S T

I n c o m i n g   C a l l
: H S E T
T i l       P O R   B u s y
    
```

*"Incoming call" display*

### 4.5.1 Call received at handset

When a call is received at the handset, the handset rings, and the display shows (and flashes) "Incoming Call: TEL0."

1. Pick up the handset.
2. Press the [📞] key and communicate with party.
3. Press the [📞] key to disconnect the line.
4. Hang up the handset.

### 4.5.2 Call received at location other than handset

When a call is received at a location other than the handset, the handset rings, and its display shows (and flashes) "Incoming Call: X" (X = TELn\*, FAXn\*, TELEX, MSD, or HSD. n = terminal no., \* =). When more than one call arrives the lowest terminal no. is displayed.

```

2 0 0 0 - 0 8 - 2 9
1 2 : 3 4   U T C
O R G
T E L E X ← Where call was received
T i l       P O R   B u s y
    
```

*"Receiving" display (telex)*

### 4.5.3 Receiving distress, safety, urgent call

When you receive a distress, safety or urgent call, a tone sounds in the handset according to call priority as below.

*Call type and tone interval*

Call	Tone Interval
Distress	<p>* = 0.1 sec</p>
Urgent	<p>* = 0.1 sec ** = 0.2 sec</p>
Safety	<p>* = 0.1 sec ** = 0.2 sec</p>
Routine	

## 4.6 Holding, Forwarding a Call

For how to hold and forward a telephone call, see page 5-6.

### 4.6.1 Holding a call

1. Press the [HOLD Print] key. "HOLD" appears on the display.

```
2 0 0 0 - 0 8 - 2 9
1 2 : 3 4   U T C
A N S       0 0 1   2 3
H S E T
          H O L D
Y | |     P O R   B u s y
```

*"Hold call" display*

**Note:** If you don't hang up the handset, press the [HOLD Print] key again to talk.

### 4.6.2 Forwarding a call

You can forward a call to a telephone in the MES network on board your ship by dialing its intercom number.

1. When you receive a call which is intended for another telephone, press the [HOLD Print] key and dial appropriate intercom number.
2. After confirming connection, press the [📞] key.

If you dial an invalid intercom number, you will hear the "busy tone". Press the [HOLD Print] key and repeat steps 1 and 2. If there is no answer, press the [HOLD Print] key to cancel forwarding.

## 4.7 Intercom


In the MES network on board the vessel you can communicate with a telephone by dialing its intercom number. Note the intercom communications are not saved to the communications log. For intercom communications by telephone, see page 5-6.

### 4.7.1 Using the intercom



1. Pick up the handset.
2. Press the [Intercomm] key.



*"Intercom" display*

3. Enter intercom number (1-3) of telephone you wish to call. (If you dial an invalid number, you will hear the "busy tone". Hang up the handset and dial again.)
4. Press the  key upon completion of call. The intercom display is erased and the standby display appears.

### 4.7.2 When receiving a call during intercom use

When you receive an outside call while talking via the intercom, you will hear three beeps of 0.3 seconds duration followed by 2.1 seconds of no tone. Press the  key to conclude intercom use, and then press the  key to communicate.

## 4.8 Abbreviated Dialing

You may register abbreviated dialing telephone numbers, and dial them in just a few steps. 50 abbreviated dialing numbers may be registered.

### 4.8.1 Programming abbreviated dialing numbers

1. Press the [ABBR Find] key. Your display should look something like the one shown below if no abbreviated dialing numbers have been entered.

```

A B B R   L I S T

N o   d a t a .

M e n u : [ * ]

```

*Abbreviated dialing number list, no entries*

2. Press the [\*] key to show the Abbreviated Dialing menu.

```

A B B R   M E N U

1 E n t r y
2 E d i t
3 R e m o v e
4 H S D   C a l l
S e l e c t : [ E n t ]

```

*Abbreviated dialing menu*

**Note:** “2 Edit” does not appear when no abbreviated dialing numbers are registered. “1 Entry” does not appear when 50 abbreviated dialing numbers have been registered. (In this case delete unnecessary abbreviated dialing numbers to enter new ones.) Further “3 Remove” and “4 HSD Call” do not appear unless OID/DID number for the HSD terminal is registered.

3. Press the [1] key to select 1 Entry.

```

A B B R   E N T R Y
█ _ _ _ _ _   N U M
N a m e : _ _ _ _ _
_ _ _ _ _
D i a l : _ _ _ _ _
_ _ _ _ _
E n t e r : [ E n t ]

```

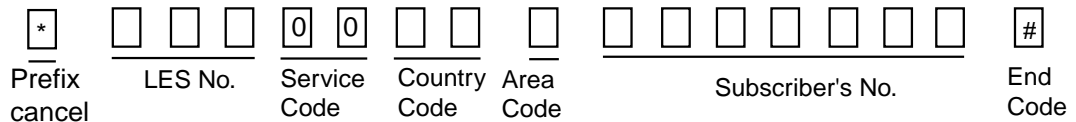
*Abbreviated dialing number input screen*

4. The cursor is now at the location where you enter a three-digit abbreviated dialing program number, 000-999. Use the numeric keys to enter a three-digit program number.
5. Press the [≡] key to select the Name field.
6. Enter the name (20 characters max.) you wish to register the number under. For example, a company name or a person. You can use the [Mode] key to switch between upper and lower case alphabet and numerics.



7. Press the [ $\approx$ ] key to select the Dial field.
8. Enter telephone number, up to twenty digits.
9. Press the [Ent] key to register followed by the [FUNC Quit] key to close the menu.

**Note:** Prefix dial number can be combined with abbreviated dial number. For example, the prefix dial connects via the Yamaguchi, Japan operator (0030081). Then, if you want to connect via a different LES, register the following abbreviated dialing number.




\* is registered with the abbreviated dialing number, therefore the line is not connected to the Yamaguchi but to the LES you select.

## 4.8.2 Dialing abbreviated dialing number

### By selection of abbreviated dialing number

Select the abbreviated dialing number by entering the number it is registered under as below.

1. Press the [ABBR Find] key.
2. Use the [ $\approx$ ] or [ $\approx$ ] key or numeric keys to select abbreviated dialing number desired.
3. Press the [] key to dial.


### By search

Use the search feature to find desired abbreviated dialing number as below.

1. Press the [ABBR Find] key.
2. Press the [ABBR Find] key again to display the Abbreviated List search screen.

A B B R L I S T	
S e a r c h      A L P H	
0 0 1    F U R U N O	
D i a l : 0 1 2 3 4 5 6 7	
8 9 0 1 2 3 4 5 6 7 8 9	
F i n d : <span style="background-color: black; color: black;">█</span> _ _ _ _	

*Abbreviated list search screen*

3. Use the numeric keys to enter up to five alphanumeric characters in the Find field.
4. Press the [Ent] key to search.
5. After finding desired abbreviated dialing number, press the [] key to dial.

### 4.8.3 Deleting abbreviated dialing numbers

You may delete unnecessary abbreviated dialing numbers as follows:

1. Press the [ABBR Find] key.
2. Press [\*] to show the Abbreviated Dialing menu.
3. Press the [3] key to select 3 Remove.
4. Use the [↗] or [↘] key or numeric keys to select abbreviated dialing number to delete.
5. Press the [DEL Prty] key. You are asked if it is all right to clear selected abbreviated dialing number.
6. Press the [Ent] key to delete.
7. Press the [FUNC Quit] key to quit.

### 4.8.4 Editing abbreviated dialing numbers

1. Press the [ABBR Find] key.
2. Use the [↗] or [↘] key to select abbreviated dialing number to edit and press the [Ent] key.
3. Press [\*] to show the Abbreviated Dialing menu.
4. Press the [2] key to select 2 Edit.
5. Edit data as appropriate and press the [Ent] key.
6. Press the [FUNC Quit] key to quit.

## 4.9 Urgent/Safety Communications

Urgent or safety communications is possible by setting priority before calling. The priority automatically becomes “routine” after completion of call.

**Safety** communicates important meteorological or navigation warning.

**Urgent** communicates safety of ship or safety of person.

1. Pick up the handset.
2. Press the [DEL Prty] key to select priority desired. Each pressing of the key selects priority in the sequence shown below. Safety and Urgent priorities are shown on the “dial” display.

← Safety → Urgent → Routine →

2000-08-29
12:34 UTC
Dial: -----
-----
Safety
Yil POR Ready

Priority →


*“Dial” display, safety priority*


3. Press the [☎] key.
4. Dial LES in three digits and press [#].
5. Communicate with LES.
6. Press the [☎] key to finish communications.
7. Hang up the handset.

**Note:** Personal ID and prefix dial are temporarily disabled in safety/urgent communications.

## 4.10 Distress Communications

Distress telephone communications are initiated with the DISTRESS button. This button is found on the hanger of the Handset IB-882-362 or on the Telephone Distress Button IB-362 when using the Handset IB-882. When the button is operated the priority of the handset is automatically set to DISTRESS.

1. Pick up the handset.
2. Open the distress button cover.
3. Press and hold down the [DISTRESS] button **six seconds**. The priority automatically becomes "DISTRESS."
4. Press the  key.
5. Dial an LES in three digits, referring to the LES Access Code Lists in Appendix C, and press the [#] key.

**Note:** The LES designated on the Distress LES menu (menu 57) is automatically called if there is no key input within 15 seconds after pressing the  key.

6. Commence communication with LES, giving your ship's name, nature of distress, assistance needed and description of your vessel.

## 4.11 Menu Operations

### 4.11.1 User and Administration modes

The user mode provides the basic functions of the Display, Setup and MES menus.

```
4 Display
1 Monitor
2 Comm. Log

Select: [Ent]
```

4 Display menu

```
5 Setup
1 Satellite
2 Gyro
3 Antenna
4 Position

Select: [Ent]
```

5 Setup menu

```
6 MES
1 Handset
2 Menu Style
3 Change Mode

Select: [Ent]
```

6 MES menu

User mode menus

The Administration mode provides the entire menu system. It is accessed with a password, thus its use is restricted to authorized personnel.

4 Display menu

```
4 Display ▼
1 Monitor
2 Comm. Log
3 Time&Charge
4 System Log
Select: [Ent]
```

```
4 Display ▲▼
5 Print All
6 Print Setup
7 Print MES
8 PrintTELFAX
Select: [Ent]
```

```
4 Display ▲
9 Print MSD*
0 Print HSD*

Select: [Ent]
```

5 Setup menu

```
5 Setup ▼
1 Satellite
2 Gyro
3 Antenna
4 Position
Select: [Ent]
```

```
5 Setup ▲▼
5 Area
6 Backup NCS
7 DistressLES
8 DMG
Select: [Ent]
```

```
5 Setup ▲
9 OID/DID
0 RcvAlarm

Select: [Ent]
```

6 MES menu

```
6 MES ▼
1 Handset
2 Menu Style
3 Change Mode
4 Date&Time
Select: [Ent]
```

```
6 MES ▲▼
5 Charge Info
6 Personal ID
7 Password
8 Test
Select: [Ent]
```

```
6 MES ▲
9 Initialize
0 ForcedClear

Select: [Ent]
```

7 TELFAX menu

```
7 TELFAX ▼
1 Time Limit
2 Credit Call
3 Prefix Code
4 Echo Cancel
Select: [Ent]
```

```
7 TELFAX ▲
5 PrintTELFAX

Select: [Ent]
```

\*Appears when OID/DID is registered.

8 HSD menu\*

```
8 HSD ▼
1 Dest. No
2 Call TEL
3 Data Rate
4 Dial Method
Select: [Ent]
```

```
8 HSD ▲
5 Auto Rate
6 Command
7 Character
8 Ignore DTR
Select: [Ent]
```

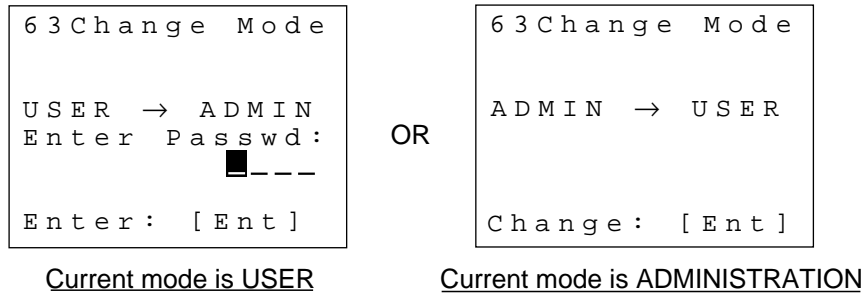
```
8 HSD ▲
9 Print HSD

Select: [Ent]
```

Administration mode menus

### 4.11.2 Changing operation mode

1. Press [FUNC Quit], [6] and [3] to display the Change Mode input screen.



*Change mode input screen*

2. Do one of the following depending on the mode in use:
  - a) **To change to the Administration mode**, enter the password and press the [Ent] key. (Password is not shown on the display; only asterisks (\*) are shown.)
  - b) **To change to the User mode**, press the [Ent] key.
3. Press the [FUNC Quit] key to close the menu.

### 4.11.3 Changing User mode format

Two types of menu formats are available: Simple and Detailed. “Simple,” the default setting, provides the menus of the User mode. This menu format is useful for ships which require access to basic functions of the handset. “Detailed” provides the menus of the Administration mode, and requires a password to open menus.

1. Press [FUNC Quit], [6] and [2] display the menu style menu.



*Menu style menu*

2. Press the [2] key to select Detailed.
3. Press the [FUNC Quit] key to close the menu.

#### 4.11.4 How to open a menu when using the Administration mode

For example, to open the Date&Time menu, do the following:

1. Press [FUNC Quit], [6] and [4]. The following display appears.

```

6 4 Date & Time

ADMIN Command
Enter Passwd:
          █ ---
Enter: [Ent]
  
```

*Date&time menu, prompt for password*

2. Enter four-digit password and press the [Ent] key. If the password entered is correct, the menu selected appears.

```

6 4 Date & Time

1 Date & Time
2 Date Form
3 Time Zone

Select: [Ent]
  
```

*Date&time menu*

**Note:** If the password is incorrect, the message "Password error!" appears and three seconds later the main menu appears.

#### 4.11.5 Customizing the User menu

You may freely choose three items to display on positions 1, 2 and 3 on the User menu.

##### Adding menus

1. Press the [FUNC Quit] key.
2. Press appropriate numeric key among 1-3 to select the location where you want to add a menu. For example, press the [2] key to select position 2. Your display then looks like the one below.

```

Main Menu
          ▼
1
2
3
4 Display
Select: [Ent]
  
```

*Main menu*

## 4. HANDSET COMMUNICATIONS

3. Press the [Ent] key, and the Custom Menu input screen appears.

```
C u s t o m   M e n u  
  
I n p u t  
M e n u   i t e m  
  
N o . 00  
E n t e r : [ E n t ]
```

### *Custom menu input screen*

4. Enter the two-digit menu number you want to add and press the [Ent] key. (See the menu tree at the back of this manual for menu number.) For example, key in 61 to add the Handset menu. Your display then looks as below.

```
M a i n   M e n u  
  
1  
2 Handset  
3  
4   D i s p l a y  
S e l e c t : [ E n t ]
```

### *Main menu*

If the menu number entered at step 4 does not exist the message “Input Error! Menu no. is not available.” appears and three seconds later the main menu appears. Menu 49 cannot be entered unless MSD OID/DID number is registered. Menus 40, 81, 82, 83, 84, 85, 86, 87 and 88 cannot be entered unless HSD OID/DID number is registered. For how to register MSD and HSD numbers see the installation manual.

5. Press the [FUNC Quit] key to close the menu.

### **Deleting menus**

1. Press the [FUNC Quit] key.
2. Select the menu item which you want to delete.
3. Press the [DEL Prty] key. Your display should look something like the one below.

```
C u s t o m   M e n u  
  
M e n u 1 :  
A n t e n n a  
i s   c l e a r e d .  
A R E   Y O U   S U R E ?  
E n t e r : [ E n t ]
```

### *Prompt for deleting custom menu*

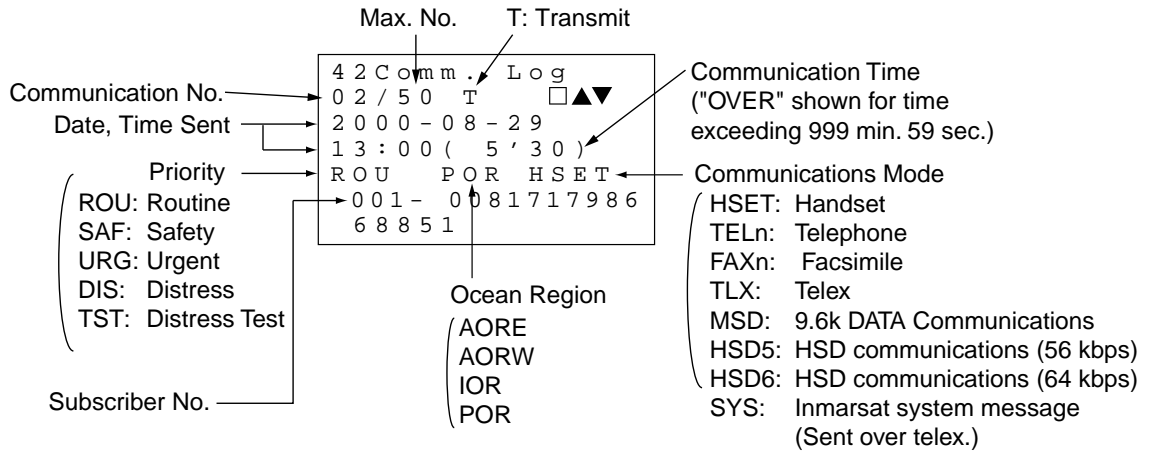
4. Press the [Ent] key to delete the menu selected.
5. Press the [FUNC Quit] key to close the menu.



## 4.12 Communications Log

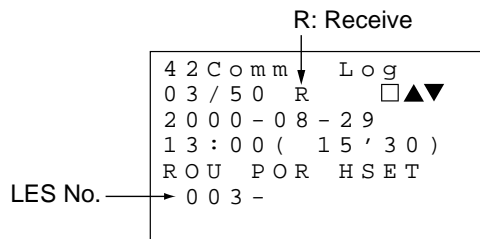
The communications log stores the latest 50 received and transmitted telephone, telex, MSD, HSD and facsimile calls, numbered from 01-50.

1. Press [FUNC Quit], [4] and [2] to show the Communications Log. The figure below shows sample Tx and Rx log entries.



Tx log

n = Terminal No.



Rx log

### Sample communication log entries

2. Use the [↵] or [⇩] key to scroll the screen if necessary. You can print the log by pressing the [HOLD Print] key.
3. Press the [FUNC Quit] key to close the menu and return to the standby display.

## 4.13 Personal ID Number (PIN)

Personal ID numbers (hereafter referred to as PIN) may be assigned to personnel to monitor usage of telephones and faxes. You must enter correct PIN before dialing in order to make a call. 50 PINs may be assigned. This function is done from the Administration mode. See page 2-10 for how to select the Administration mode.

### 4.13.1 Entering PIN

1. Press [FUNC Quit], [6] and [6] to display the Personal ID menu.

```

6 6 Personal ID
1 PID:Disable
2 PID Entry
3 List/Edit
Select:[Ent]

```

*Personal ID menu*

**Note:** If 50 PINs are registered 2 PID Entry is not displayed. In this case delete unnecessary PINs in order to enter new ones.

2. Press the [2] key to select 2 PID Entry.

```

6 6 Personal ID
Entry ALPH
USER NAME :
█-----
PID:000
Enter:[Ent]

```

*Personal ID input screen*

3. Use the alphanumeric keys to enter user's name (max. 10 alphanumeric characters and symbols) and press the [Ent] key. Multiple like names cannot be used.
4. Press [≡].
5. Enter PID number in three digits (any number between 000 and 999).
6. Press the [Ent] key.

**Note 1:** If the name or PIN entered at step 3 or 5 is already registered, you are asked if it is OK to overwrite the name or PIN. Press the [ENT] key to overwrite, or [FUNC Quit] to enter a different name.

**Note 2:** If both name and PIN pair are already registered control is returned to the main menu.

7. Press the [FUNC Quit] key to close the menu.

### 4.13.2 Enabling PIN usage

PIN usage is “disabled” in the default setting. When you enable it, you must enter personal ID to dial from a telephone or facsimile.

1. Press [FUNC Quit], [6] and [6] to display Personal ID menu.
2. Press the [1] key to select Disable.

```

6 6 Personal ID
PID Mode
1 Disable
2 Enable

Select : [ Ent ]

```

*Personal ID menu*

3. Press the [2] key to select Enable.
4. Press the [FUNC Quit] key to close the menu.

To disable use of the PIN select Disable at step 2 in the above procedure.

**Note:** With the PIN feature enabled, error results if a number is dialed without entering PIN or if an unregistered PIN is entered.

### 4.13.3 Editing, printing the PIN list

PINs may be edited or deleted as necessary.

#### Editing the PIN list

1. Press [FUNC Quit], [6] and [6].
2. Press the [3] key to select Personal ID List.

```

6 6 Personal ID
List          □▲▼
USER NAME :
FURUNO
PID : 0 0 1

Edit : [ Ent ]

```

*Personal ID list*

3. Use the [↗] or [↘] key to select personal ID to edit.
4. Change data as necessary and press the [Ent] key.

## 4. HANDSET COMMUNICATIONS

### 5. To delete a PIN, do the following:

- a) Delete user name with the [DEL Prty] key. (The PIN itself cannot be deleted.)
- b) Press the [Ent] key. The display looks as below. Press the [Ent] key again to delete the number, or press the [FUNC Quit] key to quit.

```
6 6 Personal ID
PID (000)
is cleared.
ARE YOU SURE?
Clear:[Ent]
```

*Prompt for clearing personal ID*

6. Press the [FUNC Quit] key to close the menu and return to the standby display.

### **Printing the PIN list**

1. Press [FUNC Quit], [6], [6] and [3].
2. Press the [HOLD Print] key to print. Below is a sample PIN list printout.

```
----- 66 Personal ID List <2000-06-20 00:00(UTC)> -----
Name      :PID Name      :PID Name      :PID Name      :PID Name      :PID
FURUNO    :001 BART          :145 REGGIE    :927 CARMINE   :557 MARIO     :123
GEORGE    :422 ENRIQUE      :310 IAN       :100 LIUGI     :219 ZAK       :610
FRANK     :345 RAUL         :489 BILL     :780
```

*Personal ID printout*

## 4.14 Toll Charges

You may display and print approximate toll charges. This procedure is done from the Administration mode. See page 2-10 for how to choose the Administration mode.

### 4.14.1 Setting the toll charge calculator

LESs do not send toll charges to MESs. Therefore, you may wish to calculate the toll charges assessed to you with the built-in toll charge calculator. You may register the toll charge units for 50 LES. The toll charge calculator provides only an estimate of the toll charges. Actual charges may be different.

1. Press [FUNC Quit], [6] and [5] to display the Charge Info input screen.

```

6 5 Charge Info
      □
LES : 001
Unit Time :
        060 (Sec)
Unit Charge :
        003.00 (SDR)

```

*Charge info input screen*

2. Enter LES number.
3. Press the [≡] key to select Unit Time.
4. Enter appropriate unit time (000 sec. to 999 sec.).
5. Press the [≡] key to select Unit Charge.
6. Enter appropriate unit charge and press the [Ent] key. (SDR means Special Drawing Right and it is the common unit charge used by all LES to assess toll charges.)
7. Press the [FUNC Quit] key to close the menu and return to the standby display.

### 4.14.2 Displaying toll charges

1. Press [FUNC Quit], [4] and [3] to display the Time&Charge menu.

```

4 3 Time & Charge
1 List by LES
2 List by PID
3 Data Clear

Select: [Ent]
    
```

*Time & Charge menu*

2. Press the [1] key to select 1 List by LES, or press the [2] key to select 2 List by PID.

```

4 3 Time & Charge      □▲▼
LES: 003
T 0001:20'00"
R 0000:50'00"
0000160 (SDR)
Quit: [Quit]
    
```

Time and Charge by LES

```

4 3 Time & Charge      □▲▼
<GEORGE >
COUNT: 010
T 0000:20'00"
0000040 (SDR)
Quit: [Quit]
    
```

Time and Charge by Personal ID

*Sample time & charge data*

3. Use the [↵] or [⇨] key to scroll the display if necessary.
4. Press the [FUNC Quit] key to close the menu and return to the standby display.

### 4.14.3 Clearing toll charges data

1. Press [FUNC Quit], [4] and [3] to display the Time&Charge menu.
2. Press the [3] key to select 3 Data Clear.
3. You are asked if you are sure to clear all toll charge data.
4. Press [8], [2] to clear all toll charge data.
5. Press the [FUNC Quit] key to close the menu and return to the standby display.

## 4.15 Forced Clear

You can clear the communication line as below when it cannot be cleared through normal means. This procedure is done from the Administration mode. See page 2-10 for how to choose the Administration mode.

1. Press [FUNC Quit], [6] and [0] to display the Forced Clear display.

```
60ForcedClear
Current Call
will be
cleared.
ARE YOU SURE?
Clear:[82]
```

*ForcedClear display*

**Note:** If you are not currently connected the message “MES is idle.” is displayed and three seconds later the standby display appears.

2. Press [8], [2] to clear the current connection. The display shows “Now clearing” followed by “Call cleared.” After the call is cleared the main menu appears.
3. Press the [FUNC Quit] key to close the menu.

## 4.16 Optional Telephone/Fax Setup

The TELFAX menu functions to set up the telephones and faxes of the FELCOM 82 system.

This procedure is done from the Administration mode. See page 2-10 for how to choose the Administration mode.

### 4.16.1 Restricting telephone call length

You may restrict telephone call length on outgoing calls from telephones. (You cannot restrict call length for the handset or internal calls.) The default setting is no time limit. When it is 30 seconds before the time limit is to arrive, an audible warning sounds in the telephone or handset to alert the user. For forwarded calls the call time is counted from when the call was received.

If no OID/DID is set for a telephone the Time Limit menu shows "NONE" for the telephone which does not have an OID/DID number. You may restrict call length for such a telephone, however the setting is shown as NONE unless an OID/DID number is entered.

#### How to restrict telephone call length

1. Press [FUNC Quit], [7] and [1] to show the Time Limit menu. ("NONE" appears instead of OFF or ON when no OID/DID is registered.)

```

7 1 Time Limit
      
1 TEL1 : OFF
2 TEL2 : OFF
3 TEL3 : OFF
Select : [Ent]
    
```

*Time limit menu*

2. Press appropriate numeric key to select TEL1, TEL2 or TEL3.

```

7 1 Time Limit
TEL1
1 OFF
2 Limit Time
3 Answer Only
Enter : [Ent]
    
```

*Time limit selections*



3. Press the [2] key to select 2 Limit Time. (OFF removes time restriction; select Answer Only to restrict usage of telephone selected to answer only.)

```

7 1 Time Limit
TEL1

Limit Time : 00

Enter : [Ent]

```

*Telephone time limit input screen*

4. Key in time with the numeric keys and press the [Ent] key. The available time range is 01 to 99 minutes.

**Note:** You cannot enter 00 to remove the time restriction. 00 assigns the function of the telephone as “answer (receive) only.”

5. Press the [FUNC Quit] key to close the menu and return to the standby display.

### **Printing the call time limit list**

You may print the call time limit list to get a hard copy of call time restrictions you have set.

1. Press [FUNC Quit], [7] and [1] to show the Time Limit menu.
2. Press the [HOLD Print] key to print. Below is a sample call time limit list printout.

```

----- 71 Call Time Limit <2000-06-20 00:00(UTC)> -----
TEL1 : OFF (NO LIMIT)
TEL2 : R/O (ANSWER ONLY)
TEL3 : 30 minute(s)

```

*Call time limit printout*

3. Press the [FUNC Quit] key to close the menu and return to the standby display.

### 4.16.2 Setting telephone/fax for answer only

The telephone and facsimile are set at the factory for both calling and receiving. If desired you can designate a telephone or facsimile as “answer (receive) only.”

This procedure is done from the Administration mode. See page 2-10 for how to choose the Administration mode.

1. Press [FUNC Quit], [7] and 1 to show the Time Limit menu.

```
7 1 Time Limit
1 TEL1 : OFF
2 TEL2 : OFF
3 TEL3 : OFF
Select : [Ent]
```

*Time limit menu*

2. Press appropriate numeric key to select TEL1, TEL2 or TEL3.

```
7 1 Time Limit
TEL1
1 OFF
2 Limit Time
3 Answer Only
Enter : [Ent]
```

*Time limit options*

3. Press the [3] key to select Answer Only.
4. Press the [FUNC Quit] key to close the menu.

### 4.16.3 Setting telephone as “credit call usage” telephone

You may wish to restrict the use of a telephone for credit card calls only. This can be done when a credit call adapter is connected to the system.

#### Assigning telephone function as “credit call”

1. Press [FUNC Quit], [7] and [2] to display the Credit Call menu.

```

7 2 Credit Call
      □
1 TELFAX1 : OFF
2 TELFAX2 : OFF
3 TELFAX3 : OFF
Select : [ Ent ]

```

*Credit call menu*

2. Press appropriate numeric key to select TELFAX1, TELFAX2 or TELFAX3.

```

7 2 Credit Call
TELFAX1
1 OFF
2 ON
Enter : [ Ent ]

```

*Credit call on/off screen*

3. Press the [2] key to select ON to assign function of telephone as “credit card only.”
4. Press the [Ent] key.
5. Press the [FUNC Quit] key to close the menu .

#### Printing credit call list

You can print out a hard copy of the credit call list as below.

1. Press [FUNC Quit], [7] and [2] show the Credit Call menu.
2. Press the [HOLD Print] key to print. Below is a sample credit call list printout.

```

----- 72 Credit Call <2000-06-20 00:00(UTC)> -----
TEL1 : OFF
TEL2 : ON
TEL3 : OFF

```

*Credit card call setting printout*

### 4.16.4 Echo canceller

If you hear noise through the receiver of a telephone or handset turn on the echo canceller function as follows to suppress it.

#### Turning on the echo canceller

1. Press [FUNC Quit], [7] and [4] to show the Echo Cancel menu.

```
7 4 Echo Cancel
      □
1 TEL1 : OFF
2 TEL2 : OFF
3 TEL3 : OFF
4 HANDSET : OFF
Select : [ Ent ]
```

*Echo cancel menu*

2. Press appropriate numeric key to select TEL1, TEL2, TEL3 or HANDSET.

```
7 4 Echo Cancel
HANDSET
1 OFF
2 ON

Enter : [ Ent ]
```

*Echo cancel options*

3. Press the [1] key to select OFF, or press the [2] key to select ON.
4. Press the [Ent] key.
5. Press the [FUNC Quit] key to close the menu.

#### Printing the echo canceller list

You can print out a list of echo canceller settings as below.

1. Press [FUNC Quit], [7] and [4] to show the Echo Cancel menu.
2. Press the [HOLD Print] key to print. Below is a sample echo cancel list printout.

```
----- 74 Echo Cancel <2000-06-20 00:00(UTC)> -----
TEL1   : OFF
TEL2   : ON
TEL3   : OFF
HANDSET: OFF
```

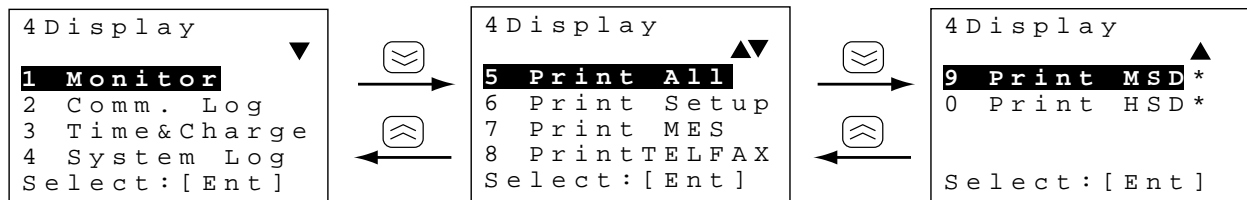
*Echo cancel printout*

## 4.17 Printing

The Display menu provides for display and printing of monitor (system status), communications log, toll charges, system log, system setup, and the MES, TELFAX, HSD and MSD menus.

### 4.17.1 How to print

1. Press the [4] key to select 4 Display.



\* Shown when OID/DID number is registered.

#### *Display menu*

2. Press appropriate numeric key to select item which you want to print.
  - 1: Monitor
  - 2: Communications Log
  - 3: Time and Charge Menu
  - 4: System Log (error messages, etc.)
  - 5: Print All (Setup, MES, TELFAX, HSD, MSD terminal AT&V commands)
  - 6: Setup Menu
  - 7: MES Menu settings
  - 8: TELFAX Menu settings
  - 9: MSD terminal AT&V commands
  - 0: HSD Menu settings
3. Press the [HOLD Print] key to print.
4. Press the [FUNC Quit] key to close the menu.

## 4. HANDSET COMMUNICATIONS

### 4.17.2 Printout examples

#### Communications Log (Menu 42)

```
----- 42 Communication Log <1999-01-01 00:00(UTC)> -----
OR LES-Destination      Prty Type Date & Time (Duration)      Charge
01 AE T0030081798668851  Rou TEL1 2000-03-01 13:01( 63'03")      38300
02 P R222                Rou TLX  2000-02-29 00:30(  5'10") -----
                                     < ( OVER ) OVERFLOW >
```

#### Communications log printout (by LES)

```
----- 42 Communication Log <1999-01-01 00:00(UTC)> -----
OR LES-Destination      Prty Type Date & Time (Duration)      Change
01 AE T0030081798668851  Rou TEL1 2000-03-01 13:01( 63'03")      38300
NAME:GEORGE
02 P R222                Rou TLX  2000-02-29 00:30(  5'10") -----
```

#### Communications log printout (by personal ID)

#### *Communications log printouts*

#### Time&Charge (Menu 43)

```
----- 43 Total Comm. Time & Charge <2000-06-20 00:00(UTC)> -----
LES   ORG time      ANS time      Charge(SDR)
001   0000:20'00"   0000:00'00"   00000010
003   0001:20'00"   0000:20'00"   00001500
-----
TOTAL 0001:40'00"   0000:20'00"   000001510
```

#### Toll charge prinout by LES

```
----- 43 Total Comm. Time & Charge <2000-06-20 00:00(UTC)> -----
NAME      COUNT   ORG      Charge(SDR)
GEORGE    010    0000:20'00"  00000010
HENRY     005    0001:20'00"  00001500
-----
TOTAL     0015   0001:40'00"  00001510
```

#### Toll charge prinout by personal ID

#### *Toll charge printouts*

#### System Log (Menu 44)

```
----- 44 System Log <2000-06-20 00:00(UTC)> -----
00-06-20 11:00[0123]ALARM:HSD Fault.
00-06-20 12:34[1234]Call Cleared by MES.
```

#### *System log printout*

**Setup (Menu 46)**

```

----- 46 System Setup Print <2000-06-20 00:00(UTC)> -----
55 Area:
           No.1   No.2                   No.1   No.2
           WMO    255   000             ICAO   255   000
           IMO    255   000             NAVAREA 255   000
56 Backup NCS:
           AORE   306                   Sat5   000
           POR    005                   Sat6   000
           IOR    003                   Sat7   000
           AORW   306                   Sat8   000
57 Distress LES:
           AORE   306                   Sat5   000
           POR    005                   Sat6   000
           IOR    003                   Sat7   000
           AORW   306                   Sat8   000
58 DMG:
  Abbreviation Ship's Name:ABCD
  Maritime                :YES
  Nature                  :Undesignated
  Course                  :000
  Speed                   :00
59 OID/DID:
           OID DID  IMN                   OID DID  IMN
TELFAX1   TEL1:01  01   343164801  HANDSET   TEL0:10  10   343164810
           FAX1:11  11   343164811  TELEX     TLX  :31  31   343164831
TELFAX2   TEL2:02  02   343164802  MSD       MSD  :21  21   343164821
           FAX2:12  12   343164812  HSD       64k  :42  42   343164842
TELFAX3   TEL3:03  03   343164803                   56k  :41  41   343164841
           FAX3:13  13   343164813

```

*System setup printout*

**MES settings (Menu 47)**

```

----- 47 MES Setup Print <2000-06-20 00:00(UTC)> -----
65 Charge Info:
           Unit  Unit      Unit  Unit      Unit  Unit      Unit  Unit
           Time  Charge    Time  Charge    Time  Charge    Time  Charge
           LES (Sec) (SDR)  LES (Sec) (SDR)  LES (Sec) (SDR)  LES (Sec) (SDR)
001   60    3.00  003   60    3.00  004   60    3.00  006   60    3.00
012   60    3.00  222   60
68 Version List:
MAIN      165-0145-0xx      DEMOD      165-0142-0xx
TERM      165-0146-0xx      SYNC       165-0143-0xx
HANDSET   055-0204-0xx      DECODE     165-0144-0xx

```

xx = Program Version No.

*MES setup printout*

#### 4. HANDSET COMMUNICATIONS

##### **Print TELFAX menu settings (Menu 48)**

```
----- 48 TEL/FAX Setup Print <2000-06-20 00:00(UTC)> -----  
71 Call Time Limit:  
    TEL1 : OFF (NO LIMIT)  
    TEL2 : R/O (ANSWER ONLY)  
    TEL3 : 30 minute(s)  
72 Credit Call:  
    TEL1 : OFF  
    TEL2 : ON  
    TEL3 : OFF  
73 Prefix Code:  
    1234567890  
74 Echo Cancel:  
    TEL1   : OFF  
    TEL2   : OFF  
    TEL3   : ON  
    HANDSET : OFF
```

*TELFAX setup printout*

##### **MSD AT&V commands (Menu 49)**

```
----- 49 MSD Setup Print <2000-06-20 00:00(UTC)> -----  
E1          COMMAND ECHO          On  
Q0          RESULT CODE SUPPRESSION Enable  
V1          DCE RESPONCE FORMAT    Verbose  
X4          RESULT CODE SELECTION  Enable  
&C1        RLSD(DCD) BEHAVIOR      Normal  
&D2        DTR BEHAVIOR            Disconnect  
&S1        DSR BEHAVIOR            Normal  
¥K1        DTE-DCE BREAK CONTROL   Clear Buffer  
+ICF=3,3   DTE-DCE CHAR FRAMING     8N1  
+IFC=2,2   DTE-DCE FLOW CONTROL     RFR/CTS  
+IPR=9600  FIXED DTE RATE           9600  
+WKSIZE=25 SAT, ARQ WINDOW SIZE    25  
+WLES=000  LAND EARTH STATION       Default  
+WRATE=9600,9600 CHANNEL DATA RATE  9600/9600  
+WRTL=120,240 RX BUFFER THRESHOLD    120,240  
+WS45=1    ERROR CORRECTION         ARQ and V.42  
+WTTL=120,240 TX BUFFER THRESHOLD  120,240  
+WXR=0     EXTENDED REPORTING       Standard
```

*MSD setup printout*

##### **HSD menu settings (Menu 40)**

```
----- 40 HSD Setup Print <2000-06-20 00:00(UTC)> -----  
81 Destination No.: _____  
82 Call Telephone : HANDSET          83 Data Rate : 64k  
84 Dial Method   : Direct(DTR)      85 Auto Rate : OFF  
86 Command       : HDLC    8bit/None
```

*HSD setup printout*



# 5. OPTIONAL EQUIPMENT

---

## 5.1 Telephone FC755D1

### 5.1.1 Telephone communication overview

The telephone FC755D1 functions to make land-to-ship and ship-to-land calls and receive calls. Three telephones/facsimiles may be installed. The handset, telephone and facsimile are assigned the following numbers.

Unit	Port	Telephone No.
Handset	HANDSET	0
Telephone, Facsimile	TEL 1	1
	TEL 2	2
	TEL 3	3

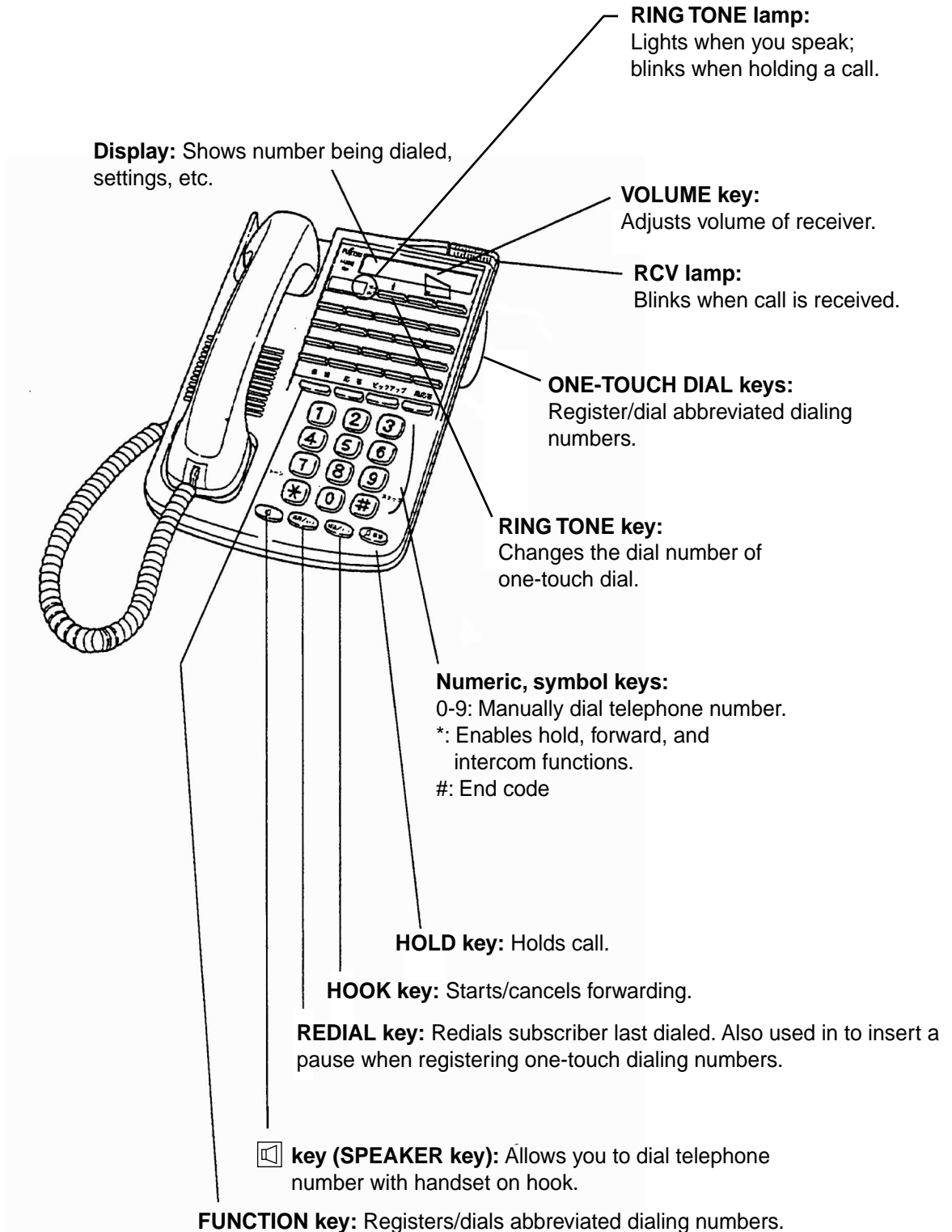
In addition to its basic functions, the telephone has the following functions:

- Forwarding a call to other telephones on board
- Intercommunicating with other telephone sets in the MES network on board the vessel (intercom)
- Dialing a subscriber's number in two digits (abbreviated dialing)
- Dialing previously dialed number (redialing)

**Note:** If you wish to connect newly the line with an LES, wait for 30 seconds after the line has been disconnected, otherwise the error message appears, resulting in no connection.

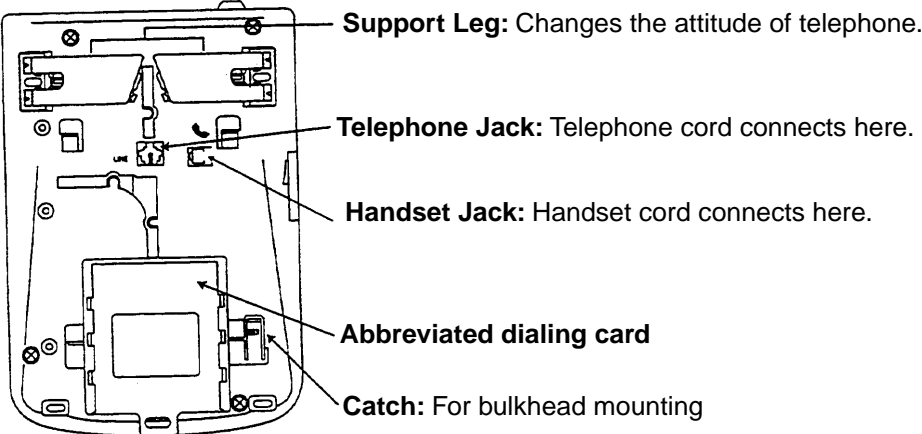
## 5.1.2 Telephone controls

### Front panel



*Telephone FC755D1*

**Underside**



*Telephone FC755D1, underside*

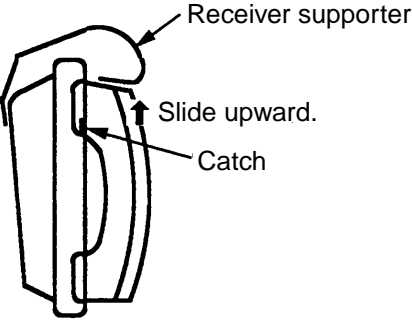
**Remarks on usage**

Confirming dial tone

Detach the receiver from the hanger and confirm the dial tone, to make a call.

How to detach receiver

Slide the receiver upward to release it from the catch and then pull it forward.



*How to detach the receiver*



**Redialing**

The redialing feature automatically redials number last dialed.

1. Pick up the receiver of telephone.
2. Press the [REDIAL] key.

**On-hook calling**

1. Press the [SPEAKER] key.
2. Dial party's number and then press the [#] key.
3. Communicate with party.

**5.1.4 Receiving**

Receiving a telephone call in the Inmarsat system is exactly the same as with a conventional telephone: simply pick up the receiver and talk with party. If plural telephones share the same ID number, they all ring when receiving a call. Pick up any receiver to answer call.

**Receiving**

1. When a telephone rings, pick up its receiver and talk. (You can adjust the volume of the earpiece with the [VOLUME] key.)
2. Hang up the receiver upon completion of call.

**Call type and tone interval**

Call type is notified as below.

*Call type and tone interval*

Call	Tone Interval
Distress	<p style="text-align: right;">* = 0.1 sec</p>
Urgent	<p style="text-align: right;">* = 0.1 sec ** = 0.2 sec</p>
Safety	<p style="text-align: right;">* = 0.1 sec ** = 0.2 sec</p>
Routine	

## 5. OPTIONAL EQUIPMENT

### 5.1.5 Intercom

In the MES network on board the vessel you can communicate with another telephone by dialing its intercom number.

#### **How to use the intercom**

1. Pick up the receiver of the telephone and confirm the dial tone.
2. Press [\*], dial intercom number and then press [#]. (If you dial an invalid number, you will hear the "busy tone". Hang up the receiver and dial again.)
3. Talk with party.
4. Hang up the receiver upon completion of call.

#### **When receiving a call during intercom use**

When you receive a outside call while talking via the intercom, you will hear three beeps of 0.3 second duration followed by 2.1 seconds of no tone. Conclude communications and hang up the receiver. Pick up the receiver when it rings, to talk with other party.

### 5.1.6 Holding a call

1. Press the [HOLD] key or [\*] key.
2. Hang up the receiver. (See note.)
3. Pick up the receiver to talk.

**Note:** You can hold a call without hanging up the receiver, by pressing the [HOLD] key again to talk.

### 5.1.7 Forwarding a call

You can forward a call to another telephone in the MES network on board the ship by dialing its intercom number.

1. When you receive a call which is for another telephone, press [\*], dial intercom number (0-3) and then press [#].
2. After confirming connection, hang up the receiver. (If you dial an invalid intercom number, you will hear the "busy tone." Press the [HOOK] key and repeat steps 1 and 2. If there is no answer, press the [HOOK] key to cancel forwarding.)

### 5.1.8 Abbreviated dialing

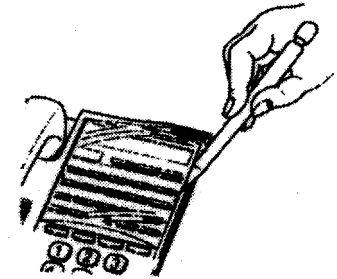
The abbreviated dialing feature lets you dial a subscriber's number in just two digits. You may register 44 abbreviated dialing telephone numbers.

#### Notes on registration

- Press keys within ten seconds of each other, otherwise key input is cancelled.
- You may write over unnecessary telephone numbers.

#### Registering dialing numbers

1. Remove one-touch dialing card using the tip of a mechanical pencil.
2. Press the [SPEAKER] key
3. Press the [ENTRY] button.
4. Press the [RING TONE] key.
5. Press one of the [ONE-TOUCH DIAL] keys.
6. Enter telephone number to register. To register another abbreviated telephone dialing number, repeat step 4 to 6.
7. Press the [ENTRY] button to confirm the registration.
8. Press the [SPEAKER] key.
9. Replace the one-touch dialing card.



*How to remove  
the one-touch  
dialing card*

## 5. OPTIONAL EQUIPMENT

### **Abbreviated dialing procedure**

1. Press the [SPEAKER] key.
2. Press the [RING TONE] key.
3. Press one of the [ONE-TOUCH DIAL] key.
4. Pick up the receiver.
5. Replace the one-touch dialing card.

### **Deleting abbreviated dialing numbers**

1. Remove one-touch dialing card.
2. Press the [SPEAKER] key.
3. Press the [ENTRY] button.
4. Press the [RING TONE] key.
5. Use the one-touch dialing keys to select the abbreviated dialing number to delete.
6. Press the [ONE-TOUCH DIAL] key pressed at step 5 again to delete.
7. Press the [ENTRY] button.
8. Press the [SPEAKER] key.
9. Replace the one-touch dialing card.

### **Function button**

The functions buttons can be used as abbreviated dialing keys.

### **Registering numbers**

1. Remove the one-touch dialing card.
2. Press the [SPEAKER] key.
3. Press the [ENTRY] button.
4. Press one of the [Function] keys.
5. Enter abbreviated dialing number to register.
6. Press the [ENTRY] button. To register another abbreviated dialing number, repeat steps 4 to 6.
7. Press the [SPEAKER] key.
8. Replace the one-touch dialing card.

### **Deleting function**

1. Remove the one-touch dialing card.
2. Press the [SPEAKER] key.
3. Press the [ENTRY] button.
4. Press the [Function] key to delete. To delete another abbreviated dialing number of the function key, repeat step 4.
5. Press the [ENTRY] button.
6. Press the [SPEAKER] key.
7. Replace the one-touch dialing card.





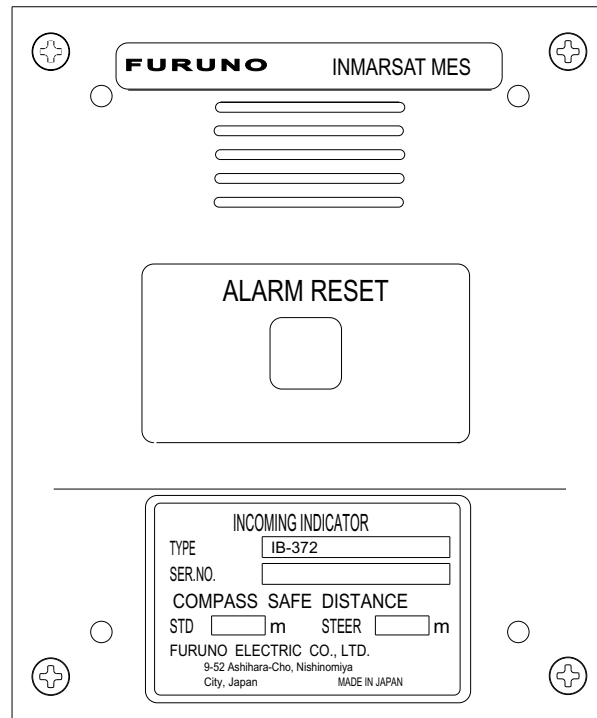
## 5. OPTIONAL EQUIPMENT

**Note 6:** Propagation delay is extremely great when a fax is sent between two ships, since the fax sent via a satellite line makes a round trip between the two ships. For this reason, fax success rate for a fax sent via the satellite line is lower than that for a land line.

**Note 7:** The FELCOM 82 is designed to use the Facsimile FAX-8070P or FAX-2850. Use of other facsimiles may not provide intended function.

## 5.3 Incoming Indicator IB-372

The IB-372 sounds an audible alarm when a telex, telephone or facsimile message is received. To silence the audible alarm, press the [ALARM RESET] button on the IB-372.



*Incoming indicator IB-372*

### 5.3.1 Ringer format

Ringer format depends on the call received as shown in table below.

*Call received and tone interval*

Unit	Tone Interval
Terminal Unit	
Telephone (including 2400 bps facsimile)	
Facsimile (9600 bps)	

## 5. OPTIONAL EQUIPMENT

### 5.3.2 Automatic alarm shut off

**Telex call:** The alarm automatically shuts itself off one minute after a telex message is received.

**Telephone call:** The alarm automatically shuts itself off when the receiver of the ringing telephone is picked up.

**Facsimile call:** Buzzer stops when facsimile answers.

### 5.3.3 Disabling the buzzer

If you do not require the buzzer, you may disable it from the handset as shown below.

1. Press [FUNC Quit], [5] and [0] to shown the RcvAlarm menu.

```
5 0 R c v A l a r m
1  D i s a b l e
2  E n a b l e
Enter : [ E n t ]
```

*RcvAlarm menu*

2. Press [1] or [2] key as appropriate.
3. Press the [FUNC Quit] key to close the menu.

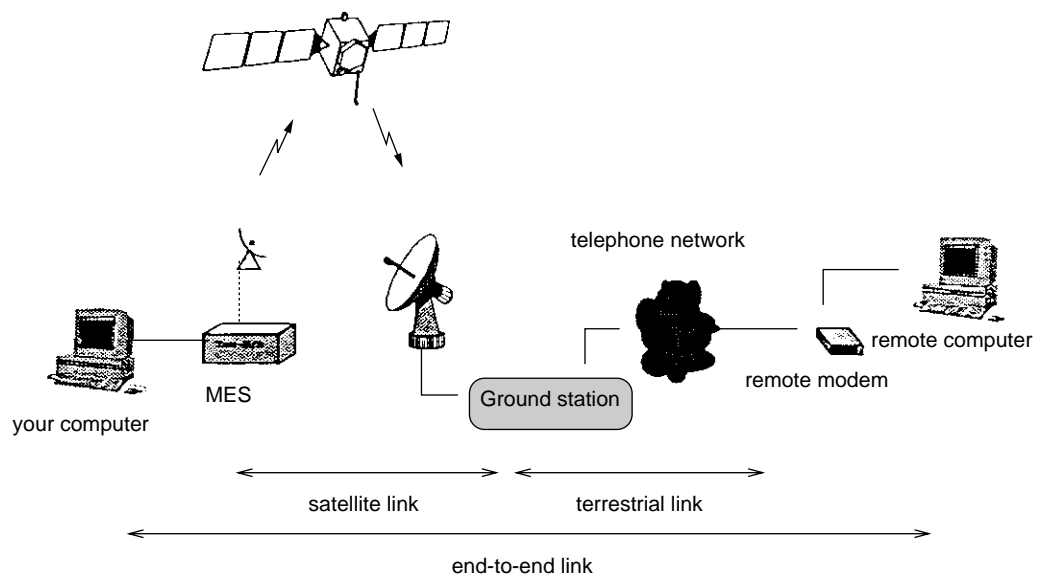
**Note:** The receive alarm may also be disabled from the terminal unit. The keying sequence is [F4], [6], type **A L A R M**, [Enter], [→], [Enter], [Esc] (twice).

# 6. 9.6k DATA COMMUNICATIONS

## 6.1 General

The Inmarsat-B 9.6k DATA services (hereinafter referred to as “9.6k DATA”) enable data communications between (a) a computer (DTE) connected to MES which supports the 9.6k DATA and (b) a remote computer (ground station) with a modem, which allows data communications using telephone lines.

Source: Inmarsat - M/B Data Services User’s Guide (published by Inmarsat)



*9.6k DATA system configuration*

The 9.6k DATA offers the maximum communication speed of 9600 bps in duplex transmission. As shown in the figure above, there are two links involved between the two computers. One is the satellite link {from the MES to the LES (ground station)} and the other the terrestrial link (telephone line from the LES to the remote modem).

Under the 9.6k DATA, the MES can be used almost like a modem for general use and controlled with AT commands. In order to ensure the maximum efficiency of data communications, however, the above two links must be set up properly.

### 6.1.1 Main features

#### Flow control

Different procedures for the DTE to control the flow of data that is sent by the MES and those for the MES to control the flow of data that is sent by the DTE can be chosen. (For further details of flow control, see next section.)

#### Communication parameters setup

Various parameters can be set including the line communication speed; the line error correction mode; the window size in the ARQ mode; and the boundary value of transmit/reception buffer.

#### Extended line report display

Detailed information (such as communication speeds and error corrections over the satellite and terrestrial links) can optionally be reported when a line is connected.

**Note:** The FELCOM 82 conforms to Inmarsat-B standards ITU-TV25ter and PCCA STD-101.

### 6.1.2 Terminology

**DCE:** Data circuit-terminating equipment. It means a communication control unit for the FELCOM 82, or a modem of an earth station at the other end.

**DTE:** Data terminal equipment.

It means a personal computer or similar equipment connected to the DCE.

**<CR>:** A code used to inform the MES that the character string for an AT command has been ended. If the DTE has a keyboard, this code can be sent to the MES by pressing the Enter or Return key.

## 6.2 About Data Communications

### Modem

A modulator/demodulator is used for data communications over a telephone line. The FELCOM 82 has a modem built into its communication unit. (The MES can be thought of as a modem.)

### AT commands

One of the command sets used to control a modem. For further information, see paragraph 6.9 AT Commands.

### Operation states

The following operation states are observed when the MES is used for data communications:

#### Command state

The MES accepts AT commands when in this state. It recognizes the characters entered via the DTE as a character string. The MES is not connected to any remote station.

#### On-line data state

In this state, the MES is performing data communications with a remote station connected to it. The characters entered via the DTE are sent to that station.

#### On-line command state

In this state, the MES is connected to a remote station, but still accepts AT commands. The characters entered via the DTE are recognized as a character string and are not sent to the remote station.

**Note:** The MES never enters the on-line data state unless it is connected to a remote station.

### Flow control

The data received from the DTE is stored in the transmit buffer of the MES. If the data volume sent from the DTE is larger than that sent from the transmit buffer to the LES, data is gradually stored in the buffer. Once the buffer becomes full with the stored data, the MES tells the DTE to stop sending data. Accordingly, data is no longer sent by the DTE. In turn, the data in the buffer is sent to the LES while the DTE is stopping data transmission. When the buffer becomes empty, the MES informs the DTE that it accepts data. Now the DTE starts sending data again. The above procedure for controlling the flow of data is called "flow control."

### **Error correction**

During data transmissions, data errors occur for various reasons. In text data such as a sentence, a minor error does not hinder the reader from presuming the correct meaning in the context. In binary data such as a program, however, even a small error is not permitted. For this reason, the sender previously adds information used to detect any data error and if an error is found in the received data, the receiver requests the sender to retransmit the data. This procedure ensures the error-free transmission of data. It is called error corrections.

The 9.6K DATA offers the ARQ mode in which error corrections are made over the satellite link and the non-ARQ mode in which no error correction is made. It is optionally possible to tell the LES whether error corrections should be made over the terrestrial link regardless of either of the above two modes.

Normally, error corrections should be made for both the satellite and terrestrial links. In some cases, however, error corrections are not recommended. For example, when files are transferred, data transfer protocols such as ZMODEM are used and they make error corrections by themselves. This means that if error corrections are also made over a link, the transfer throughput decreases because of the dual error corrections. In such a case, the use of the non-ARQ mode is rather recommended. In addition, it may be better to determine whether error corrections should be made for each of the satellite and terrestrial links, in accordance with the states of those links.

### **Terminal speed (DTE speed)**

A communication speed between the DTE and the MES. Data communications occur at 9600 bps between the MES and the LES, but this speed is not always applicable to the communications between the LES and a remote station. Since error corrections and flow control are performed in the communications between the MES and the LES and between the LES and a remote station, data is not sent without them between the DTE and a remote station. Therefore, the communication speed between terminals, that between the MES and the LES, and that between the LES and a remote station do not need to be identical. A given communication speed can be selected for communications with any remote station.



## 6.3 Considerations

**Note:** If the equipment does not function properly, restore default settings (9600 bps, 8 bit, no parity, 1 stop bit) by pressing [FUNC Quit], [9], [6], [8] and [2] at the handset. Note however that this procedure restores all default settings and clears the non-volatile memory. For this reason you may want to record settings before restoring default settings.

- The state of a data communication varies depending on the following factors, some of which are influenced by the time zone of the communication, the LES used, and the remote station connected, or change with each call:
  - State of the satellite link
  - State of the terrestrial link (delay due to routing; congestion of line; line state; etc.)
  - Settings of the MES, and the terminal and modem of the remote station
  - Compatibility between the modem of the LES and that of the remote station
  - Responsiveness and other similar characteristics of the DTE of the MES and a terminal (e.g., a computer) of the remote station.

Therefore, the data transmission speed may become slower depending on the call, or the call may be even aborted. If this occurs, retry the communication. In some cases, you may need to change the settings of the MES and the remote station.

## 6.4 Preparations for Communications

### 6.4.1 Procedure for initial setup

#### Initialize non-volatile memory/set default settings of comm. parameters

From the DTE, input the command AT&F&W, <CR>(Enter or Return depending on the PC). DTE appears when the equipment is initialized.

#### Resetting the communication parameters

When using the communications parameters stored in non-volatile memory:

1. Let the DTE operate as a communication terminal.
2. Enter "ATZ<CR>" via the DTE. When the DTE screen shows "OK," the initial setup of the communication parameters is now completed. Depending on your application, this process can be automatically carried out every time a communication is started. In this case, you do not need to perform this step.

### 6.4.2 Setting the communication parameters

For detailed information on each command, see paragraph 5.9 AT Commands. Subsequently, the initial values are indicated in parentheses.

#### Communication format

AT+ICF                      (AT+ICF=3,3: 8-bit data; no parity; 1 stop bit)  
Sets the format between the DTE and the MES

AT+WRATE                  (AT+WRATE=9600,9600)  
Sets the maximum data rate for the satellite link and that for the terrestrial link.

**Flow control**

AT+IFC	(AT+IFC=2,2: DTE → DCE = hardware control flow; DCE DTE = hardware control flow) Sets the flow control between the DTE and the MES.
AT+WRTL	(AT+WRTI=120,240: Lower limit = 120; Upper limit: 240) Sets the limits of the reception buffer for the flow control.
AT+WTTL	(AT+WTTL=120,240: Lower limit = 120; Upper limit = 240) Sets the limits of the transmit buffer for the flow control.

**Error correction**

AT+WS45	(AT+WS45=1; Satellite link = With ARQ; Terrestrial link = With error corrections) Sets whether error corrections are made for the satellite and terrestrial links.
AT+WKSIZE	(AT+WKSIZE=25) Sets the ARQ window size for communications in the ARQ mode.

**Break signal**

AT\K	(AT\K1: Clears the transmit and reception buffers and sends the break signal) Specifies the action that occurs when the break signal is received.
------	--

**Signal line control**

AT&C	(AT&C1: Changes depending on the connection states) Specifies the behavior of the CD (DCD) signal.
AT&D	(AT&D2: Disconnects the signal line if its status changes from ON to OFF) Specifies the behavior of the ER (DTR) signal.
AT&S	(AT&S1: Changes depending on the connection states) Specifies the behavior of the DR (DSR) signal.

**Display of command and result codes**

ATE	(ATE1: With echo back) Specifies whether the received command character string is echoed back.
ATQ	(ATQ0: Returns a result code) Sets whether a result code is returned.

ATV	(ATV1: Word format) Specifies the format for result codes
ATX	(ATX4: Displays the communication speed) Sets whether the communication speed is displayed at connection.
AT+WXR	(AT+WXR=0: Without extended display) Chooses the extended display of the CONNECT result code.

**Settings for Inmarsat communications**

AT+WLES	(AT+WLES=000: Stores LES access codes in memory) Stores LES access codes in memory and display the currently stored ones.
AT+WOR	(Sea area specified with telephone and facsimile terminals) Displays the currently specified sea area and changes it.
AT+WS46	(AT+WS46=11: Uses the Inmarsat system) Chooses the use of the Inmarsat system.

**Note:** The optimal values vary depending on the contents of communications, remote stations, and the states of lines. Change the settings according to the states of communications and store the modified values in the non-volatile memory.

Some communication software can automatically store the settings. If such software is used, you do not need to store the modified values in the non-volatile memory.

A sudden failure or a similar event may cause the data in the non-volatile memory to be lost (if the data is lost, the non-volatile memory is reset to the values set at the factory). The non-volatile memory is located on the CPU2 circuit board. Therefore, if the circuit board is replaced, your own settings must be stored again in the memory. For this reason, be sure to write down the values you have stored in the memory. Your data stored in the non-volatile memory is not covered by our warranty.

### 6.4.3 Setting up the communication software

The setup procedure varies depending on the communication software used. This section only mentions the points you should give attention to.

#### **Number of remote stations**

If an LES is specified with the +WLES command, do not specify an LES number. If not, specify this number including an LES number.

#### **Communication format**

This format varies depending on the remote station you are connecting to. Properly set the communication format according to that station.

#### **Flow control**

In principle, set this parameter to the hardware control (CTS/RTS). Choose the software control (XON/XOFF) if necessary, e.g., when the hardware control cannot be used by the terminal.

**Note:** For further information, refer to the instruction manual of the communication software.

## **6.5 Starting and Finishing a Communication**

### **6.5.1 Changing the sea area**

Specify a sea area using the +WOR command.

For example, to change the sea area to the Pacific Ocean:

AT+WOR=2(sea area, see below for key)<CR>

0: Auto

1: AOR-E

2: POR

3: IOR

4: AOR-W

### **6.5.2 Changing the communication parameters**

According to the contents of communications, remote stations, and the states of lines, change the settings as necessary.

### **6.5.3 Outgoing calls**

Specify the number of the remote station using the D command, and then make a call.

For example, to call 123456789 in Japan for an automatic connection via the LES of 003:

1. If no LES is specified (when AT+WLES=000), enter: ATD003-00-81-123456789<CR>
2. If +WLES=003 is previously specified, enter: ATD00-81-123456789<CR>.

### **6.5.4 Incoming calls**

If a call is received, the DTE screen shows "RING."

1. If a call is received in the automatic reception mode (when register S0 is set to non-zero), the reception sequence is automatically started.
2. In the manual reception mode (when register S0 is set to zero), enter "ATA<CR>" after confirming the arrival of a call. The reception sequence is started.

## 6.5.5 Finishing a communication

### Disconnection by the remote station

The satellite link is disconnected with “NO CARRIER” displayed. A different message may be displayed depending on your communication software.

### Disconnection by the MES

To finish the communication at the MES:

1. Use the ER (DTR) signal to disconnect the communication line.
  - a) Set up the MES and communication software beforehand as follows:
    - 1- Set up the MES so that the line is disconnected with the AT&D2 {ER (DTR)} signal.
    - 2- Set up the communication software so that the line is disconnected with the ER (DTR) signal.
  - b) If the line is disconnected with the communication software during a communication, the communication can be finished.
2. Go to the on-line command mode with the break signal and then use the ATH command.
  - a) Previously set up the MES as follows:
    - 1- Using the AT\K command (to choose the break signal processing), set up the MES so that it enters the on-line command mode with the break signal.
  - b) Send the break signal from the communication software.
  - c) The MES enters the on-line command mode.
  - d) Enter the ATH command from the communication software. The communication is finished.

**Note:** The first procedure is recommended.

## 6.6 Viewing the State of MES

### View a program name and number:

AT+GMI	Displays a manufacturer name
AT+GMM	Displays an equipment name
AT+GMR	Displays a program version number.

### View various settings stored in the non-volatile memory:

AT&V	Displays the contents of the non-volatile memory.
------	---

### Find the details of an error that has occurred:

AT+WQ	Displays the details of the error when OK or CONNECT is not displayed (when ERROR or NO CARRIER is shown).
-------	--

### View the brief description of a command:

AT&H	Displays a list of commands.
------	------------------------------

### View other states:

AT+GCAP	Displays the class of the extended AT command set.
AT+W	Displays the command extension system for the +W command set.
AT+WINMARSAT	Displays a list of commands that have been added by Inmarsat.



## 6.7 AT Commands

### 6.7.1 What are the AT commands?

They are model control commands that were developed by Hayes, a modem manufacturer in the United States. At present, the AT commands are adopted in a large number of modems for use with general telephone lines. The AT commands are named as such because a character string, "AT" (meaning "attention") is prefixed to each of them.

The AT commands that can be used by the MES include:

- Basic commands (same as the commands that are generally used in most of the modems)
- Extended commands (commands added for Inmarsat)

The data corrections and data compression (MNP, V42, and V.42bis) as used over telephone lines are not used on any satellite channel. Therefore, there is no command available for them.

To enter a command, prefix "AT" to it like "ATA" and "ATE0" (except "A"). Except for some specific commands, you may want to describe multiple commands on a single line, like "ATV1Q0." A different command may be placed immediately after any basic command. However, a character ";" must be placed immediately after any extended command.

Any command parameter enclosed in brackets ([ ]) may be omitted. If it is omitted, the default value is assumed.

**Note 1:** Any parameter included in a command followed by (%) may be stored in the non-volatile memory.

**Note 2:** In principle, the commands that were specified in the SDM by Inmarsat are employed, but some of the added and omitted commands or parameters are different because of reasons related to the specification of equipment.

## 6.7.2 Basic AT commands

Command	Description
A	<p>Forcibly puts the MES in the ANSWER mode.</p> <p>If this command is entered when a call arrives, the connection sequence is started.</p> <p>e.g.: ATA&lt;CR&gt;</p>
A/	<p>Executes the just previously entered command again.</p> <p>This command is independently used without entering "AT." You do not need to enter &lt;CR&gt; after "/."</p> <p>e.g.:</p> <pre>ATxxxxxxxxxxx (just previously entered command) (i) ... A/ The command in (i) is executed again.</pre>
D	<p>Sends a call to a remote station with the specified number. D[dialed character string]</p> <p>The following characters may be used for the dialed character string:</p> <ul style="list-style-type: none"> <li>0-9           Used to specify the telephone number of a remote station.</li> <li>( ) and -     Used to delimit the telephone number.</li> <li>#             Used to indicate the end of the telephone number (may be omitted).</li> <li>;             Used to return to the command mode after dialing.</li> </ul> <p>e.g.:</p> <ol style="list-style-type: none"> <li>1. ATD003-00-81-123456789#     (when AT+WLES=000) 123456789 in Japan is dialed for automatic connection via the LES of 003.</li> <li>2. ATD00-81-123456789         (when AT+WLES is not 000) The number is dialed via the LES specified with the +WLES command. The trailing character "#" may be omitted.</li> <li>3. ATD003-00-81-123456789#; This is the same as the above 1, except that the MES returns to the command mode after the number is dialed.</li> </ol>
E▲	<p>Specifies whether the received command character string is echoed back. E[&lt;n&gt;]</p> <ul style="list-style-type: none"> <li>n=0   Not echoed back</li> <li>n=1   Echoed back</li> <li>• If &lt;n&gt; is omitted, it is assumed as "1."</li> </ul> <p>e.g.: ATE1&lt;CR&gt;</p>
H	<p>Disconnects the connected line. H[&lt;n&gt;]</p> <ul style="list-style-type: none"> <li>n=0           Disconnects the connected data line. If a telephone or facsimile machine is in use, its communication cannot be cut off. (To cut off the communication, the MES must be in the on-line command mode.)</li> <li>n=1           Does nothing.</li> <li>• If &lt;n&gt; is omitted, it is assumed as "0."</li> </ul> <p>e.g.: ATH&lt;CR&gt;</p>

Command	Description
O	<p>Causes the MES to go from the on-line command mode to the off-line data mode.</p> <p>e.g.: ATO&lt; CR&gt;</p>
Q▲	<p>Sets whether a result code is returned.</p> <p>Q[&lt;n&gt;]</p> <p>n=0           The MES returns a result code.</p> <p>n=1           The MES does not return a result code.</p> <ul style="list-style-type: none"> <li>• If &lt;n&gt; is omitted, it is assumed as "0."</li> <li>• If the Q1 command is used, no result code is returned for the subsequent commands.</li> </ul> <p>e.g.: ATQ0&lt;CR&gt;</p>
S	<p>Stores a value in an S register or reads data from it.</p> <p>For further information, see the section "S Registers."</p> <p>e.g.: 1. ATS3=13&lt;CR&gt;: Stores "13" in register S3. 2. ATS3?&lt;CR&gt;: Displays the contents of register S3.</p>
V▲	<p>Specifies the format for a result code.</p> <p>V[&lt;n&gt;]</p> <p>n=0           Displays a result code in the numeric format.</p> <p>n=1           Displays a result code in the word format.</p> <ul style="list-style-type: none"> <li>• If &lt;n&gt; is omitted, it is assumed as "1."</li> </ul> <p>e.g.: ATV1&lt;CR&gt;</p>
X▲	<p>Specifies whether the communication speed (plus BUSY/NO DIALTONE) is displayed.</p> <p>X[&lt;n&gt;]</p> <p>n=0           Does not display the communication speed (plus BUSY/NO DIALTONE) when a communication is established.</p> <p>n=1 - 4       Displays the communication speed (plus BUSY/NO DIALTONE) when a communication is established.</p> <ul style="list-style-type: none"> <li>• If &lt;n&gt; is omitted, it is assumed as "4."</li> </ul> <p>e.g.: ATX4&lt;CR&gt;</p>
Z	<p>Initializes the command parameters.</p> <p>The parameters stored in the non-volatile memory are initialized with its initial values.</p> <p>e.g.: ATZ&lt;CR&gt;</p>

## 6. 9.6k DATA COMMUNICATIONS

Command	Description
&C▲	<p>Specifies the behavior of CD (DCD) signal.</p> <p>&amp;C[&lt;n&gt;]</p> <p>n=0      The CD signal is always ON.</p> <p>n=1      The CD signal varies depending on how the MES is connected to the LES</p> <ul style="list-style-type: none"> <li>• If &lt;n&gt; is omitted, it is assumed as 1.</li> </ul> <p>e.g.:    AT&amp;C1&lt;CR&gt;</p>
&D▲	<p>Specifies the behavior of the ER (DTR) signal.</p> <p>&amp;D[&lt;n&gt;]</p> <p>n=0      Ignores the ER signal.</p> <p>n=1      If the ER signal changes from ON to OFF during a connection, the MES returns to the on-line command mode.</p> <p>n=2      If the ER signal changes from ON to OFF during a connection, the line is disconnected.</p> <ul style="list-style-type: none"> <li>• If &lt;n&gt; is omitted, it is assumed as 2.</li> </ul> <p>e.g.:    AT&amp;D2&lt;CR&gt;</p>
&F	<p>Initializes the command parameters.</p> <p>All of the parameters are initialized to the values set at the factory. However, the contents of the non-volatile memory remain unchanged. (To initialize the contents of the non-volatile memory, enter the AT&amp;F command and then enter AT&amp;W.)</p> <p>e.g.:    AT&amp;F&lt;CR&gt;</p>
&H	<p>Displays a list of commands.</p> <p>&amp;H[&lt;n&gt;]</p> <p>n=0      Displays a list of basic commands.</p> <p>n=1      Displays a list of extended commands.</p> <p>n=2      Displays a list of values in the S registers.</p> <ul style="list-style-type: none"> <li>• If &lt;n&gt; is omitted, it is assumed as 0.</li> </ul> <p>e.g.:    AT&amp;H1&lt;CR&gt;</p>
&S▲	<p>Specifies the behavior of the DR (DSR) signal.</p> <p>&amp;S[&lt;n&gt;]</p> <p>n=0      Always keeps the DR signal ON.</p> <p>n=1      Follows the sequence of the communication protocol.</p> <p>n=2      Follows the CD signals.</p> <ul style="list-style-type: none"> <li>• If &lt;n&gt; is omitted, it is assumed as 1.</li> </ul> <p>e.g.:    AT&amp;S1&lt;CR&gt;</p>
&V	<p>Displays the contents of the non-volatile memory.</p> <p>e.g.:    AT&amp;V&lt;CR&gt;</p>
&W	<p>Stores the currently set parameters in the non-volatile memory.</p> <p><b>Note:</b> Ensure that the power never be turned OFF for approximately 10 seconds after this command is executed. Otherwise, the data may not be successfully written to the non-volatile memory.</p> <p><b>Note:</b> If the parameters stored in the non-volatile memory are not correct when the power is turned ON, they are reset to the values set at the factory.</p>

Command	Description
\K▲	<p>Specifies the action that occurs when the break signal is received.</p> <p>\K[&lt;n&gt;]</p> <p>n=0,1    Clears the data in the transmit/reception buffer and sends the break signal.</p> <p>n=2,3    Skips the data in the buffer and takes priority in sending the break signal.</p> <p>When n=0,2, the MES sends the break signal and then enters the on-line command mode.</p> <ul style="list-style-type: none"> <li>• If &lt;n&gt; is omitted, it is assumed as "1."</li> </ul> <p>e.g.:    ATK1&lt;CR&gt;</p>
\Q▲	<p>Sets the flow control between the DTE and the MES (further detailed settings can be made using the +IFC command).</p> <p>\Q[&lt;n&gt;]</p> <p>n=0        No flow control (equivalent to +IFC0,0)</p> <p>n=1        XON/XOFF flow control (equivalent to +IFC1,1)</p> <p>n=2        RS/CS flow control (equivalent to +IFC2,2)</p> <p>n=3        CS flow control (equivalent to +IFC0,2)</p> <p>n=4        Mono-directional XON/XOFF flow control (equivalent to +IFC0,1)</p> <ul style="list-style-type: none"> <li>• If &lt;n&gt; is omitted, it is assumed as "2."</li> </ul> <p>e.g.:    ATIQ1&lt;CR&gt;</p>

**6.7.3 Extended AT commands**

Command	Description
+GCAP	<p>Displays the class of extended AT command set supported by the MES.</p> <p>+GCAP +GCAP=?</p> <p>Once this command is accepted, the following character string is displayed: +GCAP: +W</p> <p>e.g.: AT+GCAP&lt;CR&gt;</p>
+GMI:	<p>Displays a manufacturer name.</p> <p>Once this command is accepted, the following character string is displayed: FURUNO Electric Co., Ltd. Copyright(C) 1996-97 All rights reserved.</p> <p>e.g.: AT+GMI&lt;CR&gt;</p>
+GMM	<p>Displays an equipment name.</p> <p>Once this command is accepted, the following character string is displayed: FELCOM 81, Inmarsat-B Mobile Earth Station</p> <p>e.g.: AT+GMM&lt;CR&gt;</p>

Command	Description
+GMR	<p>Displays a program version number.</p> <p>e.g.: AT+GMR&lt;CR&gt;</p>
+ICF▲	<p>Sets the communication formation between the DTE and the MES.</p> <p>+ICF=[&lt;format&gt;[,&lt;parity&gt;]]</p> <p>format=3 8-bit data; without parity; 1 stop bit  format=4 7-bit data; without parity; 2 stop bits  format=5 7-bit data; with parity; 1 stop bit</p> <ul style="list-style-type: none"> <li>• If &lt;format&gt; is omitted, it is assumed as "3."</li> </ul> <p>parity=0 Odd-number parity  parity=1 Even-number parity  parity=3 Space parity</p> <ul style="list-style-type: none"> <li>• If &lt;parity&gt; is omitted, it is assumed as "3."</li> </ul> <p>+ICF?</p> <ul style="list-style-type: none"> <li>• Displays the currently set value as follows:  +ICF:&lt;format&gt;,&lt;parity&gt;</li> </ul> <p>+ICF=?</p> <ul style="list-style-type: none"> <li>• Displays the effective ranges of parameters for this command as follows:  +ICF: (3-5), (0,1,3)</li> </ul> <p>e.g.: AT+ICF=3,0&lt;CR&gt;</p>
+IFC▲	<p>Sets the flow control between the DTE and the MES.</p> <p>+IFC=[&lt;DTE→DCE&gt;[,&lt;DCE→DTE&gt;]]</p> <p>&lt;DTE→DCE&gt; specifies how the data transmission from the DCE is controlled by the DTE.</p> <p>DTE→DCE=0 Does not perform the flow control.  DTE→DCE=1 Performs the flow control with DC1(XON)/DC3(XOFF). DC1/DC3 is not transmitted to the LES.  DTE→DCE=2 Performs the flow control with RFR(RTS).  DTE→DCE=3 Performs the flow control with DC1(XON)/DC3(XOFF). DC1/DC3 is transmitted to the LES.</p> <ul style="list-style-type: none"> <li>• If &lt;DTE→DCE&gt; is omitted, it is assumed as "2."</li> </ul> <p>&lt;DCE→DTE&gt; specifies how the data transmission from the DTE is controlled by the DCE.</p> <p>DCE→DTE=0 Does not perform the flow control.  DCE→DTE=1 Performs the flow control with DC1(XON)/DC3(XOFF).  DCE→DTE=2 Performs the flow control with CTS.</p> <ul style="list-style-type: none"> <li>• If &lt;DCE→DTE&gt; is omitted, it is assumed as "2."</li> </ul> <p>+IFC?</p> <ul style="list-style-type: none"> <li>• Displays the currently set value as follows:  +IFC: DTE→DCE, DCE→DTE</li> </ul> <p>+IFC=?</p> <ul style="list-style-type: none"> <li>• Displays the effective ranges of parameters for this command as follows:  +IFC: (0-3),(0-2)</li> </ul> <p>e.g.: AT+IFC=2,2&lt;CR&gt;</p>

## 6. 9.6k DATA COMMUNICATIONS

Command	Description												
<p><b>+IPR▲</b></p>	<p>Sets the communication speed (fixed speed at the DTE) between the DTE and the MES).</p> <p>+IPR=[&lt;n&gt;]</p> <table border="0"> <tr> <td>n=1200</td> <td>Sets 1200 bps.</td> </tr> <tr> <td>n=2400</td> <td>Sets 2400 bps.</td> </tr> <tr> <td>n=4800</td> <td>Sets 4800 bps.</td> </tr> <tr> <td>n=9600</td> <td>Sets 9600 bps.</td> </tr> <tr> <td>n=14400</td> <td>Sets 14400 bps.</td> </tr> <tr> <td>n=19200</td> <td>Sets 19200 bps.</td> </tr> </table> <ul style="list-style-type: none"> <li>• If &lt;n&gt; is omitted, it is assumed as "9600."</li> </ul> <p>+IPR?</p> <ul style="list-style-type: none"> <li>• Displays the currently set value as follows: +IPR: n</li> </ul> <p>+IPR=?</p> <ul style="list-style-type: none"> <li>• Displays the effective ranges of parameters for this command as follows: +IPR: (1200, 2400, 4800, 9600, 14400, 19200)</li> </ul> <p>e.g.: AT+IPR=0&lt;CR&gt;</p>	n=1200	Sets 1200 bps.	n=2400	Sets 2400 bps.	n=4800	Sets 4800 bps.	n=9600	Sets 9600 bps.	n=14400	Sets 14400 bps.	n=19200	Sets 19200 bps.
n=1200	Sets 1200 bps.												
n=2400	Sets 2400 bps.												
n=4800	Sets 4800 bps.												
n=9600	Sets 9600 bps.												
n=14400	Sets 14400 bps.												
n=19200	Sets 19200 bps.												
<p><b>+W</b></p>	<p>Displays the command extension system supported by the MES.</p> <p>+W</p> <p>+W=?</p> <p>Once this command is accepted, the following character string is displayed: "101", "+WINMARSAT"</p> <p>e.g.: AT+W&lt;CR&gt;</p>												
<p><b>+WINMARSAT</b></p>	<p>Displays a list of the commands in the +W&lt;text&gt; format, which have been added by Inmarsat.</p> <p>+WINMARSAT</p> <p>+WINMARSAT=?</p> <p>Once this command is accepted, the following character string is displayed: "+WKSIZ", "+WLES", "+WOR", "+WQ", "+WXR", "+WRATE", "+WRTL", "+WTTL"</p> <p>e.g.: AT+WINMARSAT&lt;CR&gt;</p>												
<p><b>+WKSIZ▲</b></p>	<p>Sets the ARQ window size that is used for communications in the ARQ mode. Normally, this command requires no modification.</p> <p>+WKSIZ=[&lt;n&gt;]</p> <ul style="list-style-type: none"> <li>• Sets the ARW window size to "n."</li> <li>• If &lt;n&gt; is omitted, it is assumed as "25."</li> </ul> <p>+WKSIZ?</p> <ul style="list-style-type: none"> <li>• Displays the currently set ARW window size as follows: +WKSIZ: n</li> </ul> <p>+WKSIZ=?</p> <p>Displays the effective ranges of parameters for this command as follows: +WKSIZ: (1-63)</p> <p>e.g.: AT+WKSIZ=25&lt;CR&gt;</p>												



Command	Description
+WLES▲	<p>Stores the LESs access code used for a data call, in the MES.</p> <p>+WLES=&lt;nnn&gt;</p> <ul style="list-style-type: none"> <li>• Specifies the LES whose access code is &lt;nnn&gt;. If any value other than 3-digit one is entered, an error is generated.</li> <li>• &lt;nnn&gt; cannot be omitted. If it is omitted, an error occurs.</li> <li>• If "000" is entered, the leading three digits of the D command are assumed as the LESs access code. If you enter any 3-digit value other than "000," you do not need to specify the LESs access code in the D command. The access code entered here is used.</li> </ul> <p>+WLES?</p> <ul style="list-style-type: none"> <li>• Displays the currently specified access code for the LES as follows: +WES: nnn</li> </ul> <p>+WLES=?</p> <ul style="list-style-type: none"> <li>• No particular response is returned by the MES.</li> </ul>
+WOR	<p>e.g.: AT+WLES=000&lt;CR&gt;</p> <p>Changes the currently specified sea area or displays it.</p> <p>+WOR[=&lt;n&gt;]</p> <p>Enter a new sea area to &lt;n&gt; by choosing its value from:</p> <ul style="list-style-type: none"> <li>0: The appropriate sea area is automatically chosen (Auto).</li> <li>1: Eastern Atlantic Ocean (AOR-E)</li> <li>2: Pacific Ocean (POR)</li> <li>3: Indian Ocean (IOR)</li> <li>4: Western Atlantic Ocean (AOR-W)</li> <li>5-8: Currently not used (the sea area is not changed)</li> </ul> <p>If &lt;n&gt; is omitted, the currently specified sea area is displayed as follows:</p> <p>+WOR: n</p> <p>+WOR=?</p> <p>Displays the effective range of parameter for this command as follows:</p> <p>+WOR: (0-8)</p> <p>Note: The usage of this parameter differs from that in the SDM.</p> <p>e.g.: AT+WOR=0&lt;CR&gt;</p>

Command	Description
+WQ	<p>Queries error information.</p> <p>+WQ[=&lt;n&gt;]</p> <ul style="list-style-type: none"> <li>The following information is displayed in accordance with the just previous result cord: <ol style="list-style-type: none"> <li>If the result code is NO CARRIER, BUSY, or NO ANSWER, a cause code is displayed in the hexadecimal notation.</li> <li>If the result codes is ERROR or NO DIAL TONE, an error state is displayed in the decimal notation.</li> <li>If the result code is OK, CONNECT, CONNECT&lt;text&gt;, or RING, nothing is displayed.</li> </ol> </li> <li>The following error information is displayed in accordance with the value for &lt;n&gt; : <p>Decimal notation</p> <p>&lt;m&gt;           when n=0</p> <p>+WQ: &lt;m&gt;,&lt;text&gt;   when n=1</p> <p>&lt;m&gt;: A value showing the error state</p> <p>&lt;text&gt;: A text showing the error state</p> <p>Hexadecimal notation</p> <p>&lt;xxxx&gt;       when n=0</p> <p>+WQ: &lt;xxxx&gt;,&lt;text&gt;       when n=1</p> <p>&lt;xxxx&gt;: A cause code</p> <p>&lt;text&gt;: A text showing the error state</p> </li> </ul> <ul style="list-style-type: none"> <li>If &lt;n&gt; is omitted, it is assumed as "1."</li> <li>For the value for &lt;m&gt;, see the section for "Extended Error Codes"; for the value for &lt;xxxx&gt;, see the section for "Cause Codes."</li> </ul> <p>+WQ=?</p> <p>Displays the effective ranges of parameters for this command as follows:</p> <p>+WQ: (0,1)</p> <p>e.g.:   AT+WQ=1&lt;CR&gt;</p>
+WRATE▲	<p>Sets the maximum data rate for the satellite link and that for the terrestrial link.</p> <p>+WRATE=&lt;sat_rate&gt;[,&lt;ter_rate&gt;]</p> <p>&lt;sat_rate&gt;       Data rate for satellite link</p> <p>&lt;ter_rate&gt;       Maximum data rate for terrestrial link</p> <ul style="list-style-type: none"> <li>If &lt;ter_rate&gt; is omitted, it is assumed to be the same as &lt;sat_rate&gt;.</li> </ul> <p>+WRATE?</p> <ul style="list-style-type: none"> <li>Displays the currently set data rate as follows:</li> </ul> <p>+WRATE: sat_rate,ter_rate</p> <p>+WRATE=?</p> <p>Displays the effective ranges of parameters for this command as follows:</p> <p>+WRATE: (9600),(1200-14400)</p> <p>e.g.:   AT+WRATE=9600,9600&lt;CR&gt;</p>
+WRTL▲	<p>Sets the limits for the reception buffer, which are used for the flow control. Normally, you do not need to set this parameter.</p> <p>+WRTL=[&lt;LOW&gt;[,&lt;high&gt;]]</p> <p>&lt;low&gt;    Value for lower limit (0-511)</p> <p>&lt;high&gt;   Value for upper limit (1-512)</p> <ul style="list-style-type: none"> <li>If &lt;high&gt; is omitted, it is assumed to be &lt;low&gt;+120.</li> <li>If &lt;low&gt; is also omitted, it is assumed to be 120 with &lt;high&gt; assumed as 240.</li> <li>If any value that does not fall within the effective ranges is specified, an error is generated regardless of whether that value is entered by the user or automatically calculated as a default value. In this case, the previous value remains valid.</li> </ul> <p>+WRTL?</p> <ul style="list-style-type: none"> <li>Displays the currently set values as follows:</li> </ul> <p>+WRTL: low, high</p> <p>+WRTL=?</p>

Command	Description																				
<p><b>+WS45▲</b></p>	<p>Sets whether error corrections are made over the line.  <b>+WS45=&lt;n&gt;</b></p> <ul style="list-style-type: none"> <li>• Sets whether error corrections are made for the satellite and terrestrial links as follows:</li> </ul> <table border="1" data-bbox="446 403 1308 571"> <thead> <tr> <th><u>Value for &lt;n&gt;</u></th> <th><u>Satellite link</u></th> <th><u>Terrestrial link</u></th> <th><u>End-to-end</u></th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Without ARQ</td> <td>Without error corrections</td> <td>NARQ</td> </tr> <tr> <td>1</td> <td>With ARQ</td> <td>With error corrections</td> <td>ARQ</td> </tr> <tr> <td>200</td> <td>Without ARQ</td> <td>With error corrections</td> <td>NARQ</td> </tr> <tr> <td>201</td> <td>With ARQ</td> <td>Without error corrections</td> <td>NARQ</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>• If &lt;n&gt; is omitted, it is assumed as "1."  The error corrections include those specified in ITU-T V.42 and others (such as MNP) and differ depending on how they are used over the terrestrial link.</li> </ul> <p><b>+WS45?</b></p> <ul style="list-style-type: none"> <li>• Displays the currently set value as follows:  <b>+WS45:n</b></li> </ul> <p><b>+WS45=?</b></p> <ul style="list-style-type: none"> <li>• Displays the effective ranges of parameters for this command as follows:  <b>+WS45:(0,1,200,201)</b></li> </ul> <p>e.g.: AT+WS45=1&lt;CR&gt;</p>	<u>Value for &lt;n&gt;</u>	<u>Satellite link</u>	<u>Terrestrial link</u>	<u>End-to-end</u>	0	Without ARQ	Without error corrections	NARQ	1	With ARQ	With error corrections	ARQ	200	Without ARQ	With error corrections	NARQ	201	With ARQ	Without error corrections	NARQ
<u>Value for &lt;n&gt;</u>	<u>Satellite link</u>	<u>Terrestrial link</u>	<u>End-to-end</u>																		
0	Without ARQ	Without error corrections	NARQ																		
1	With ARQ	With error corrections	ARQ																		
200	Without ARQ	With error corrections	NARQ																		
201	With ARQ	Without error corrections	NARQ																		
<p><b>+WS46▲</b></p>	<p>Specifies the radio system used. Normally, you do not need to set this parameter.  <b>+WS46=&lt;n&gt;</b></p> <p>Only 11 (showing Inmarsat) is valid for &lt;n&gt;. If you try to set this parameter to any other value, an error is generated.</p> <p><b>+WS46?</b></p> <ul style="list-style-type: none"> <li>• Displays the currently set value as follows:  <b>+WS46:11</b></li> </ul> <p><b>+WS46=?</b></p> <p>Displays the effective range of parameter for this command as follows:  <b>+WS46:(11)</b></p> <p>e.g.: AT+WS46=11&lt;CR&gt;</p>																				

Command	Description															
<p><b>+WTTL▲</b></p>	<p>Sets the limits for the transmit buffer, which are used for the flow control. Normally, you do not need to set this parameter.</p> <p><b>+WTTL=[&lt;low&gt;[,&lt;high&gt;]]</b>              &lt;low&gt;    Value for lower limit (0-511)              &lt;high&gt;   Value for upper limit (1-512)</p> <ul style="list-style-type: none"> <li>• If &lt;high&gt; is omitted, it is assumed to be &lt;low&gt; + 120.</li> <li>• If &lt;low&gt; is also omitted, it is assumed to be 120 with &lt;high&gt; assumed as 240.</li> <li>• If any value that does not fall within the effective ranges is specified, an error is generated regardless of whether that value is entered by the user or automatically calculated as a default value. In this case, the previous value remains valid.</li> </ul> <p><b>+WTTL?</b>              • Displays the currently set values as follows:                +WTTL: low, high</p> <p><b>+WTTL=?</b>              Displays the effective ranges of parameters for this command as follows:                +WTTL: (0-511),(1-512)</p> <p>e.g.:  AT+WTTL=120,240&lt;CR&gt;</p>															
<p><b>+WXR▲</b></p>	<p>Sets the extended display of the CONNECT result code.</p> <p><b>+WXR=[&lt;n&gt;]</b></p> <table border="1" data-bbox="395 974 1353 1131"> <thead> <tr> <th>Value for &lt;n&gt;</th> <th>Extended information</th> <th>Display of CONNECT result code</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>None</td> <td>CONNECT &lt;DTE-DCE rate&gt;</td> </tr> <tr> <td>1</td> <td>Included</td> <td>CONNECT &lt;DTE-DCE rate&gt;</td> </tr> <tr> <td>2</td> <td>None</td> <td>CONNECT &lt;DCE-DCE rate&gt;&lt;ARQ NARQ&gt;</td> </tr> <tr> <td>3</td> <td>None</td> <td>CONNECT &lt;DCE-DCE rate&gt;</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>• If &lt;n&gt; is omitted, it is assumed as "0."</li> <li>• &lt;DTE-DCE rate&gt; shows the terminal speed at the MES.</li> <li>• &lt;DCE-DCE rate&gt; shows whichever smaller value of the communication speed from the MES to the LES and that from the LES to the remote station.</li> <li>• For &lt;ARQ NARQ&gt;, see the description of the +WS45 command.</li> <li>• If INCLUDED is chosen for the extended information, the following information is displayed when a communication is established:              +WXHR: &lt;rate&gt;,&lt;ec&gt;    State of satellite link              +WXTTR: &lt;rate&gt;,&lt;ec&gt;    State of terrestrial link              +WXXKR: &lt;k&gt;            ARQ window size              CONNECT &lt;DTE-DCE rate&gt;</li> <li>• &lt;rate&gt; shows each communication speed and &lt;ec&gt; whether error corrections are made.</li> <li>• This is only valid when you specify Q0, V1, or X1 that causes "CONNECT" to be indicated.</li> </ul> <p><b>+WXR?</b>              • Displays the currently set value for &lt;n&gt; as follows:                +WXR: n</p> <p><b>+WXR=?</b>              • Displays the effective range of parameter for this command as follows:                +WXR: (0-3)</p>	Value for <n>	Extended information	Display of CONNECT result code	0	None	CONNECT <DTE-DCE rate>	1	Included	CONNECT <DTE-DCE rate>	2	None	CONNECT <DCE-DCE rate><ARQ NARQ>	3	None	CONNECT <DCE-DCE rate>
Value for <n>	Extended information	Display of CONNECT result code														
0	None	CONNECT <DTE-DCE rate>														
1	Included	CONNECT <DTE-DCE rate>														
2	None	CONNECT <DCE-DCE rate><ARQ NARQ>														
3	None	CONNECT <DCE-DCE rate>														

## 6.8 S Registers

**ATSm=<n>**

- Stores the value “n” in the S register located in the “m”th position.

**ATSm?**

- Reads the value from the S register located in the “m”th position.

Register name	Description	Initial value
S0▲	Specifies whether an incoming call is automatically accepted. Setting range: 0 Not automatically accepted 1-255 Automatically accepted	0
S1	(Reserved)	-
S2	(Reserved)	-
S3▲	Specifies a CR code. Setting range: 0-127	13
S4▲	Specifies a LF code. Setting range: 0-127	10
S5▲	Specifies a BS code. Setting range: 0-32, 127	8
S6	(Reserved)	-
S7	(Reserved)	-
S8	(Reserved)	-
S10	(Reserved)	-
S12	(Reserved)	-

**Note:** Do not modify any value stored in the reserved S registers and the S registers that are not listed here. The operation under any modified value is not covered by our warranty.

## 6.9 Result Codes

Result codes are used to represent responses to a command from the DTE or the states of the MES. They are shown in the word or numeric format, which can be specified with the V command. The meanings of result codes are listed below:

Word format	Numeric format	Meaning	+WQ command response
OK	0	The communication procedure has been successfully completed.	None
CONNECT	1	The line has been connected.	None
RING	2	The incoming call has been displayed.	None
NO CARRIER	3	The line has been cut off (the connection has not been successfully completed or the communication has been finished).	Cause code (hexadecimal)
ERROR	4	Command error	Extended error code
NO DIALTONE	6	The outgoing call has failed.	Extended error code
BUSY	7	The line is busy (e.g., a telephone or facsimile machine is in use or the remote station is busy).	Cause code (hexadecimal)
NO ANSWER	8	No response has been returned to the attempted outgoing call.	Cause code (hexadecimal)
CONNECT 1200	5	The communication has been established at 1200 bps.	None
CONNECT 1200 ARQ	5	The communication has been established at 1200 bps. (ARQ mode)	None
CONNECT 2400	10	The communication has been established at 2400 bps.	None
CONNECT 2400 ARQ	10	The communication has been established at 2400 bps. (ARQ mode)	None
CONNECT 4800	11	The communication has been established at 4800 bps.	None
CONNECT 4800 ARQ	11	The communication has been established at 4800 bps. (ARQ mode)	None
CONNECT 9600	12	The communication has been established at 9600 bps.	None
CONNECT 9600 ARQ	12	The communication has been established at 9600 bps. (ARQ mode)	None
CONNECT 19200	20	The communication has been established at 19200 bps.	None
CONNECT 19200 ARQ	20	The communication has been established at 19200 bps. (ARQ mode)	None
CONNECT 38400	21	The communication has been established at 38400 bps.	None
CONNECT 38400 ARQ	21	The communication has been established at 38400 bps. (ARQ mode)	None
CONNECT 1200 NARQ	30	The communication has been established at 1200 bps. (non-ARQ mode)	None
CONNECT 2400 NARQ	31	The communication has been established at 2400 bps. (non-ARQ mode)	None
CONNECT 4800 NARQ	32	The communication has been established at 4800 bps. (non-ARQ mode)	None
CONNECT 9600 NARQ	33	The communication has been established at 9600 bps. (non-ARQ mode)	None
CONNECT 19200 NARQ	34	The communication has been established at 19200 bps. (non-ARQ mode)	None
CONNECT 38400 NARQ	35	The communication has been established at 38400 bps. (non-ARQ mode)	None

## 6.10 +WQ Cause Codes

Cause codes are used to indicate the states of communications. They are sent by the LES. If the NO CARRIER, BUSY, or NO ANSWER result code is generated, its details can be displayed with the +WQ command.

## 6.11 +WQ Extended Error Codes

Extended error codes are used to show the details of any error that has occurred (with the ERROR or NO DIALTONE result code generated). The details of the error can be displayed using the +WQ command. The values and meanings of extended error codes are listed below:

Value	Text	Meaning
100	syntax error	There is a syntax error in the command line.
101	invalid parameter	There is an invalid parameter in the command line.
102	missing mandatory parameter	There is a missing parameter in the command line.
103	too many parameters	There are too many parameters in the command line.
104	invalid parameter length	The length of any parameter is invalid (+WLES, +WTNID).
200	facility unavailable	The entered command is unavailable.
201	no call announcement	An A command has been entered when there is no incoming call.
202	not connected	The data communication failed after an O command was entered.
300	MES busy	The MES is busy (e.g., a telephone is in use or the MES is not synchronous with the TDM).
301	MES unavailable	The MES is not properly functioning.
302	MES not responding	There is no response from the MES.
400	satellite not found	The MES has failed in synchronizing with the NCS TDM in the sea area.
401	invalid LES	The MES has failed in accessing the specified LES.
402	invalid TNID	The MES has failed in accessing the specified TNID.
1000		Reserved.
2000		Reserved.

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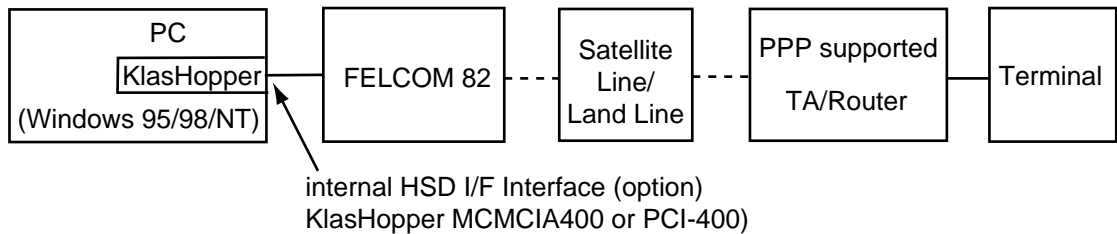
# 7. HSD COMMUNICATIONS

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This section provides the setting information for operation of an HSD (High Speed Data) Terminal. A computer fitted with an HSD interface is required. An HSD Terminal communicates over land ISDN line and Inmarsat MES, at 64 kbps or 56 kbps (USA). The HSD Terminal can be used to access the internet, send digital images, teleconferencing, remote medical assistance, etc. For communication procedures see the owners manual of the HSD interface.

This manual discusses the HSD Terminal contained in the HSD Interface. For communication settings and operation refer to the manual for the HSD I/F Terminal and Router.

Connecting a single PC as in the figure below you can connect to a subscriber much easier than by using a dial-up router.



*HSD configuration with TA/Router*

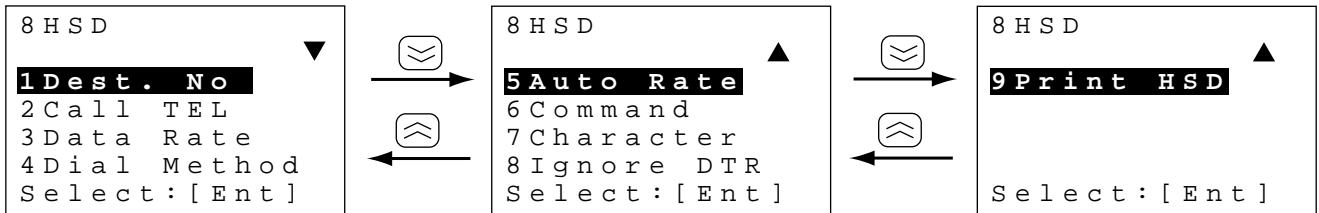
This configuration offers these advantages:

- PPP (Point-to-Point Protocol) supported. Therefore, KlasHopper is not required at the receiving end. You can connect to an internet service provider with an ordinary modem or terminal adapter.
- Web browser, mail software may be used.

## 7.1 HSD Setup

This procedure is done from the Administration mode. See page 2-10 for how to choose the Administration mode.

1. Press [FUNC Quit] and [8] to select the HSD menu.



*HSD menu*

2. Press appropriate numeric key to select item desired.
3. Press the [FUNC Quit] key several times to close the menu.

### Destination No.

For direct call key in subscriber's complete ISDN number, beginning with LES number. Maximum 20 digits may be used. Prefix dialing cannot be used.

```

8 1 Dest. No.
No. : 0 0 0 _ _ _ _ _
_ _ _ _ _
Enter : [ Ent ]
    
```

*HSD menu, destination no. input screen*

### Call TEL

Chooses the handset or telephone to use for HSD calling. The default setting is Handset.

```

8 2 Call TEL
1 TEL1
2 TEL2
3 TEL3
4 HANDSET
Enter : [ Ent ]
    
```

*HSD menu, Call telephone selection screen*

**Data Rate**

Choose the data rate from 64k (Japan, Europe) and 56k (USA). The default setting is 64k. Confirm data rate of subscriber before setting.

```

8 3 D a t a   R a t e
1  6 4 k
2   5 6 k

E n t e r : [ E n t ]

```

*HSD menu, data rate selection screen*

**Dial Method**

Choose the dial method from Direct (DTR) and Address (V.25bis). The default setting is Direct.

**Direct** means direct call. When the HSD Terminal turns on communications begins with party registered on the HSD menu. The owner's manual for the HSD Interface refers to Direct Dial as "Hot Dial."

**Address** means address call. Calling begins after specifying subscriber (CRN command) at the HSD Terminal. The owner's manual for the HSD Interface refers to Address as "V.25bis Dial."

```

8 4 D i a l   M e t h o d
1  D I R E C T
2  A D D R E S S

E n t e r : [ E n t ]

```

*HSD menu, dial method selection screen*

**Auto Rate**

Auto Rate determines whether or not to receive an HSD call whose data rate is different from that set on the HSD menu. The default is OFF which prevents receiving. Use the OFF setting for an HSD Terminal which cannot automatically adjust its synchro clock to match data rate.

```

8 5 A u t o   R a t e
1  O F F
2   O N

E n t e r : [ E n t ]

```

*HSD menu, auto rate selection screen*

**Command (format)**

Set the V.25bis command format for address calls sent from the HSD Terminal to the FELCOM 82. Select HDLC (default setting) or BSC depending on specifications of the HSD Terminal.

```
8 6 C o m m a n d
1  H D L C
2  B S C
Enter : [ Ent ]
```

*HSD menu, command format selection screen*

**Character (format)**

Choose the character format for address calls sent from the HSD Terminal to the FELCOM 82. Select 8bit (default setting) or 7bit depending on specifications of the HSD Terminal.

```
8 7 C h a r a c t e r
1  8 b i t / N o n e
2  7 b i t / O d d
Enter : [ Ent ]
```

*HSD menu, character format selection screen*

**Ignore DTR**

Choose whether the HSD terminal (router, etc.) from which to receive an address call outputs the DTR signal or not. Choose "Normal" (default setting) for HSD terminal which outputs the DTR signal; "Ignore" for HSD terminal which does not output the DTR signal.

```
8 8 I g n o r e   D T R
1  N o r m a l
2  I g n o r e
Enter : [ Ent ]
```

*HSD menu, ignore DTR selection screen*

## 7.2 Automatic HSD Call

### 7.2.1 How to make an automatic HSD call

Two types of automatic HSD calling are available: direct call and address call. You can select the calling method from 4 Dial Method on the HSD menu, and the default setting is direct call.

#### **Direct call (Hot dial)**

A single subscriber's ISDN number is preregistered at the handset. Communications begin when subscriber's number is dialed from the HSD Terminal. For further information see the owner's manual for the HSD Terminal.

The FELCOM 82 begins processing an HSD call when it receives the DTR ON signal from the HSD Terminal.

#### **Address call (V25.bis dial)**

For HSD communications with multiple subscribers, subscriber's number is entered from the HSD Terminal to call.

Calling begins when the FELCOM 82 receives the CRN command. "CRNxxxxx": CRN is a V.25bis command, xxxxx is a subscriber's number

When an HSD communications line is connected, the terminal unit status displays RX C/H (HSD), RX IF AGC Level (HSD), and 2<sup>nd</sup> Local (HSD).

### 7.2.2 How to clear an automatic HSD call

#### **Clearing by caller**

The line with the subscriber is cleared when the HSD Terminal turns off DTR, which starts the call clearing sequence. When DTR goes off the FELCOM 82 sends the clear signal to the LES and the HSD modem in the communication unit of the FELCOM 82 turns off DCD, CTS and DSR.

#### **Clearing by callee**

When the callee clears an HSD call, the LES sends the clear signal to the callee's HSD Terminal. The HSD modem in the communication unit of the FELCOM 82 turns off DSC, CTS, DSR. The HSD Terminal, in response to the DSR signal, turns off DTR.

## 7.3 Manual HSD Call

### 7.3.1 Manual HSD call

Dial HSD number manually when you cannot make an HSD call by direct call or address call.

Using the telephone selected from "Call TEL" of the HSD menu, dial as follows:

#### **Manual HSD call from the handset**

1. Press the [ABBR Find] and [\*] keys to show the ABBR MENU.

```

A B B R   M E N U

1 E n t r y
2 E d i t
3 R e m o v e
4 H S D   C a l l
S e l e c t : [ E n t ]
    
```

*ABBR MENU*

**Note:** 1 Entry, 2 Edit and 3 Remove may not be displayed depending on abbreviated dialing setting.

2. Press the [4] key to select 4 HSD Call.

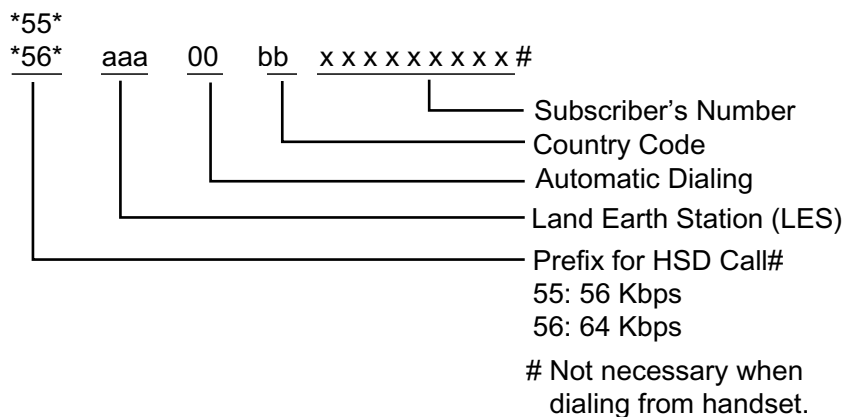
```

H S D   C A L L

N o : ■ _ _ _ _ _
-----
D a t a R a t e :   6 4 k
C a l l :   O F F H O O K
E n t e r :   [ E n t ]
    
```

*HSD number input screen*


3. Dial subscriber's complete number. To change data rate go to step 4, otherwise got to step 6.



*Dialing sequence for manual HSD call*

4. Press the [≡] key.
5. Press [⟨] or [⟩] to select appropriate data rate to 56 kbps or 64 kbps, respectively.

**Note:** To cancel an HSD call in progress, press [ABBR FIND], [\*], [4] and [Ent] key.

6. Press the  key to start the call.
7. Operate the HSD Terminal to transmit data.

### **7.3.2 Manually clearing HSD connection**

Using the telephone selected from “Call TEL” of the HSD menu, dial [\*], [5], [9], [#].

## 7.4 Receiving an HSD Call

When an HSD call is received the equipment normally answers it automatically.

**Note:** Some HSD terminals cannot receive.

The internal HSD interface

### Direct call

The HSD Terminal uses the DTR signal to respond to received HSD call. DTR is off when the equipment is idle. When a call arrives, the FELCOM 82 turns on RI. The HSD Terminal detects the RI signal and turns on DTR. This causes the FELCOM 82 to turn off RI and turn on DSR, CTS, DCD, to communicate over land line.

### Address call

DTR is not used in receiving an address call; the HSD Terminal uses it for sending data, such as control commands, to the FELCOM 82. When an address call arrives the HSD Terminal responds according to DTR state as below.

#### Address call and DTR ON

When an address call arrives, the FELCOM 82 turns off RI and sends the indication "INC" to the HSD Terminal. The FELCOM 82 starts receiving processing five seconds after receiving "INC." When processing is completed, RI goes off and DSR, CTS, DCD go on, to communicate over land line.

The HSD Terminal may send the "DIC" command to the FELCOM 82 within five seconds of receiving "INC," telling the FELCOM 82 to stop receiving processing. This is done in the case of overlapping calls. If this occurs while a call is being relayed, the CIC command is sent to the FELCOM 82 to reinitiate processing.

#### Address call and DTR OFF

When an address call arrives, the FELCOM 82 turns on RI. This tells the HSD Terminal to turn on DTR, which causes the FELCOM 82 to send "INC" to the HSD Terminal to indicate it is receiving. The HSD Terminal then sends the CIC command to the FELCOM 82 to tell it to start receiving processing. When processing is completed, RI goes off and DSR, CTS, DCD go on, to communicate over land line.

When the HSD Terminal sends DIC instead of CIC, the FELCOM 82 sends the indication VAL to stop receiving processing. Furthermore, when the CRN command or other three-character command is sent the FELCOM 82 sends the indication INV.



## 7.5 V.25bis Commands and Indications

The HSD Terminal controls the FELCOM 82 with commands and the FELCOM 82 directs the HSD Terminal with indications. These commands and indications are as below.

### V.25bis commands

Command	Description
CRNxx . . . x	<p>Subscriber number specified and called. xx . . . x Subscriber number (20 digits max.)</p> <p><u>Useable characters:</u> "0-9", " " (space), "-", "#" " " and "-" can be used to separate digits for clarity; they are not recognized as part of subscriber's number. "#" is recognized as end code (input is not mandatory). " ", "-" and "#" are not sent to CU.</p> <p><u>Examples:</u></p> <p>CRN0030081123456789 (Subscriber's number is 003081123456789) CRN0030081-12-345-6789 (Same number as above except "-" inserted for clarity) CRN0030081 12-345-6789# (Same number as first number above except " ", "-" inserted for clarity and " #" inserted to show end of number)</p>
DIC	Prevents automatic reply to received calls.
CIC	Allows automatic reply to received calls.

Consecutive commands cannot be accepted. Commands use IA5 characters. Upper or lower case may be input, but case cannot be mixed.

### V.25bis indications

Indication	Description
INC	Informs DTE of incoming call
INV	Informs of invalid command from terminal.
VAL	Informs of valid command from terminal.
CFIxx	<p>Informs of "Call failed reply" in response to CRN command.</p> <p>xx (reason) ET: Subscriber is busy. CB: Telephone/fax busy (CU is busy). RT: Subscriber's DTE is not answering (subscriber not connected). AB: Subscriber not replying ("Scr Vec Ack" not received).</p>

## 7.6 Usage Hints

### Applications

HSD communications can be used for

- Network connection via TCP/IP router
- Sending digital images
- Sending large files
- Teleconferencing
- Voice coding

### Communication with other makes of Inmarsat-B terminals

For communication over a network, HSD communications time may increase depending on communications content. In this case, normal telephone and fax communications are disabled (except distress), thus frequency of communications and communications time must be carefully considered when drawing up communications plans. If communications overlap one another, it may be necessary to install an additional MES.

### Landline

Most landlines use ISDN circuits, and rules of operation vary with country. Thus several ISDN terminals may be necessary.

### Circuit delay

Most landlines uses ISDN circuits. Since the rules and regulations for ISDN vary with country use the appropriate ISDN terminal.

### Propagation delay

A delay of 240 msec exists on the satellite circuit line between the MES and coast earth station. A 100 msec delay occurs in Tx processing and Rx. Furthermore, a propagation delay may occur on the landline between the land terminal and coast earth station depending on the distance between them.

### Line delay

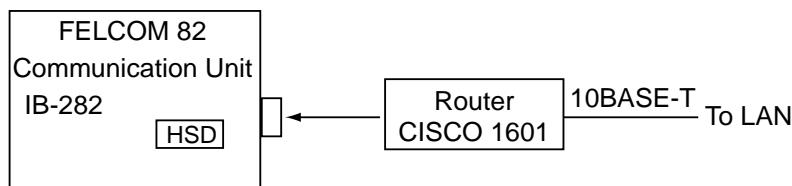
A delay of about 15-20 seconds occurs on transmission of file from an HSD Terminal to coast earth station.

**TCP/IP protocol**

- When throughput is slow due to propagation delay, enlarge the size of the TCP window to compensate for the delay. TCP size setting depends on protocol stack and OS. Consult respective operator's manual for advice.
- When using a remote router, raising the communications cue (buffer) setting can speed up throughput time. However, in some cases it may be necessary for the ship and land terminals to have the same router. Some routers cannot be used for Inmarsat HSD communications, especially those which cannot accommodate circuits which have large propagation delay. Consult with router maker and dealer to determine suitable router.
- For further details consult the network manager.

**Router setting for network connection example**

	<b>Name</b>	<b>Maker</b>
Router	CISCO 1601	CISCO SYSTEMS (USA)
IOS Software	SFC-1601C-11.33	CISCO SYSTEMS (USA)
Cable	CAB-449MT	CISCO SYSTEMS (USA)

*Router connection***Router setting for network connection**

Setting for CISCO1601 (DTR dial-up)

Set subscriber number as \*51\* ...#

## 7. HSD COMMUNICATIONS

```
cisco1611#sh conf
version 11.3
service udp-small-servers
service tcp-small-servers
!
hostname cisco1601
!
enable password *****
!
username land-term password 0 *****
!
interface Ethernet0
 ip address 192.168.2.1 255.255.255.0
!
interface Serial0
 ip address 192.168.10.10 255.255.255.0
 encapsulation ppp
 no keepalive
 dialer dtr
 dialer-group 1
 ppp authentication chap
!
ip classless
ip route 0.0.0.0 0.0.0.0 192.168.10.1
ip route 192.168.0.0 255.255.255.0 192.168.10.1
ip route 192.168.1.0 255.255.255.0 192.168.10.1
dialer-list 1 protocol ip permit
snmp-server community public R0
!
line con 0
 exec-timeout 0 0
line vty 0 4
 password *****
 login
!
end

cisco1601#
```

This example shows only the minimum necessary settings for confirmation. Further details can be obtained from a Cisco dealer or Cisco's home page (<http://www.cisco.com>). For other router see its operator's manual.

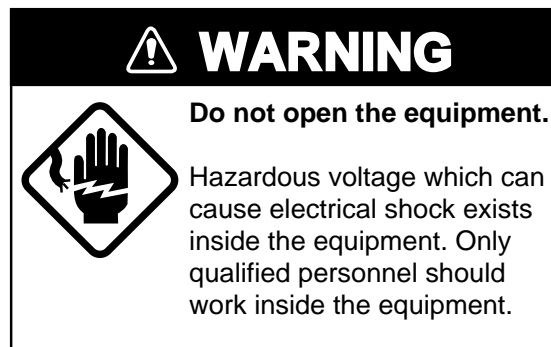
**Network configuration**

- Network configuration depends on application and number of terminals used. Generally, setup is done on the user's equipment.
- Setup depends on shipboard network and land network. For details contact the network manager.
- We recommend that identification be exchanged between sender and receiver. Where required use packet filtering and firewall.
- FURUNO will assume no responsibility for security-related problems.

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# 8. MAINTENANCE, TROUBLESHOOTING

---



## 8.1 Maintenance

### 8.1.1 Checks

- Keep the units clean and dry at all times. Dust or dirt may be removed with a soft, dry cloth. DO NOT use commercial cleaners. They may remove paint and markings.
- The connector, cables and earth terminal on the rear panel of the communication unit should be checked periodically for tightness and cleaned if necessary.
- Check the cable between the communication unit and handset for damage and rust. Clean if necessary.

### 8.1.2 Replacement of battery

The CPU and AD Converter Boards in the communication unit are each fitted with a lithium battery which stores data when the power is turned off.

The life of the battery is about five years. When the battery is completely dead the contents of the communications log are erased. For this reason, note the date of battery replacement and have the battery replaced (by a qualified technician) well before its expected expiration.

Name	Type	Code No.
Lithium Battery	CR1/2 8.L-F	000-103-769

### 8.1.3 Replacement of fuse

A fuse is on the AD Converter Board in the communication unit. If the fuse blows the gyro signal will be lost. In this case "GYRO" flashes on the handset, regardless of whether the gyro signal is normal or the gyro is properly connected. Have a qualified technician replace the fuse.

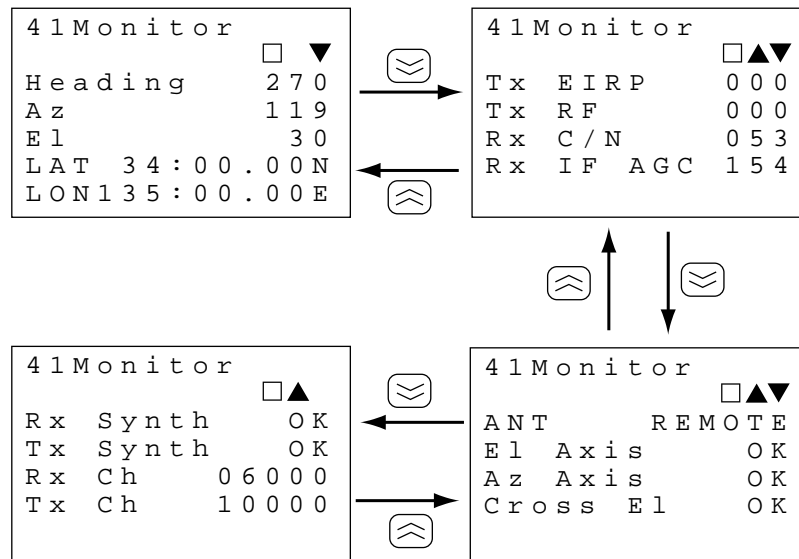
Name	Type	Code No.
Fuse	FGMB 2A 250V	000-122-000



## 8.2 Checking Equipment Status

You can check equipment status, and print out the results, from the handset.

1. Press [FUNC Quit], [4], [1] to show the Monitor display. Scroll the display as below with the [↵] and [⇐] keys to view data.



*Monitor display*

2. To print the contents of the monitor displays, press the [Hold Prt] key. A sample printout is shown below.

```

----- 41 Monitor <2000-06-20 00:00(UTC)> -----
(a) { Current Satellite POR
      Channel Status SYNC
      MES Status Ready
      (e) { Tx EIRP Level 000
            Tx RF Level 000
            Rx C/N 053
            Rx IF AGC Level 154

(b) { Heading 270 DEG
      Antenna Bearing 209 DEG
      Antenna Azimuth 119 DEG
      Antenna Elevation 30 DEG
      (f) { Rx Synthesizer OK
            Tx Synthesizer OK

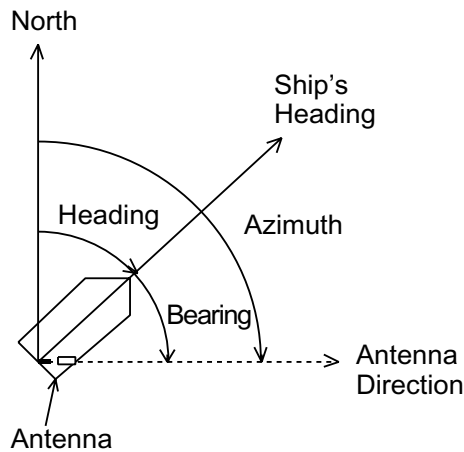
(c) { Position LAT 34:00.00N
            LON 135:00.00E
      (g) { Antenna Status REMOTE
            El AXIS OK
            Az AXIS OK
            Cross El AXIS OK

(d) { NAV DATA NMEA
      GYRO DATA OK
      (h) { Rx Channel 11292
            Tx Channel 10000
  
```

*Sample monitor display printout*

**Monitor display description**

- a) Displays status: satellite, channel, MES and Tx.
  - Current Satellite:** Displays satellite currently being used.
  - Channel Status:** "SYNC" (synchronized with channel) or "UNSYNC" (not synchronized with channel).
  - MES Status:** Shows "Ready" when system is ready to communicate; "Busy" when communicating; "Wait" while searching for satellite.
  - Tx:** OFF during no communication: ON while communicating.
- b) Displays antenna data: heading, bearing, azimuth and elevation.



*Antenna data*

- c) Ship's position from navigational device.
- d) OK shown when gyro data is correctly received; NMEA when nav data is correctly received. NONE appears when there is no gyro/nav data input. HOLD indicates manual heading input.
- e) Check of transmitter and receiver sections.
  - TX EIRP Level:** Monitors output power from the Antenna Unit. (HPA Board check: Normal value at transmission is more than 23.)
  - TX RF Level:** Monitors output power from the Communication Unit. (RF CONV Board check: Normal value at transmission is 12-38.)
  - RX C/N:** Shows RX C/N level. Normal value is more than 40.
  - RX IF AGC Level:** Shows RX IF AGC level. Normal value is more than 150.
- f) Check of transmitter and receiver sections. OK or NG (No Good) shown as results.
  - Rx SYN:** Rx synthesizer check
  - Tx SYN:** Tx synthesizer check

- g) Check of antenna status. OK or NG is shown for EI Axis, Az Axis and Cross EI Axis. REMOTE is displayed for antenna status when the communications unit is controlling the antenna; FAULT for antenna error.

**EI AXIS:** Elevation axis  
**Az AXIS:** Azimuth axis  
**Cross EI AXIS:** Cross elevation axis

- h) Rx and Tx channel number

**Note:** Equipment status may also be checked from the terminal unit.

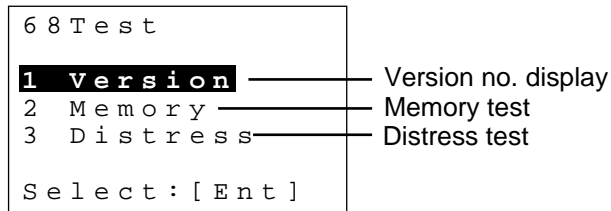
## 8.3 Tests

This section provides information necessary for running the equipment's diagnostic facilities.

### 8.3.1 Displaying the test menu

The communication and antenna units can be checked the handset. This procedure is done from the Administration mode. See page 2-10 for how to choose the Administration mode.

1. Press [FUNC Quit], [6] and [8] to display the Test menu.

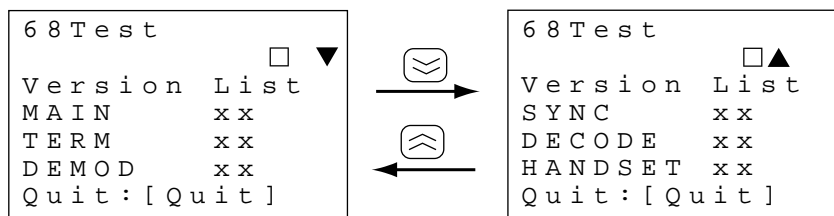


*Test menu*

2. Press appropriate numeric key to select a test and press the [Ent] key.
3. Press the [FUNC Quit] key several times to close the menu.

### 8.3.2 Program version no.

1. Press the [1] key at the Test menu to show the program version no. list.



xx = Program Version No.

*Program version no. list*

2. Press the [FUNC Quit] key several times to return to the Test menu.

**Printing the program version no. list**

Press the [HOLD Print] key at the Version List display to print the program version no. list.

```

----- 68 Version List <2000-06-20 00:00(UTC)> -----
MAIN          165-0145-0xx          DEMOD          165-0142-0xx
TERM          165-0146-0xx          SYNC           165-0143-0xx
HANDSET       165-0152-0xx          DECODE         165-0144-0xx
    
```

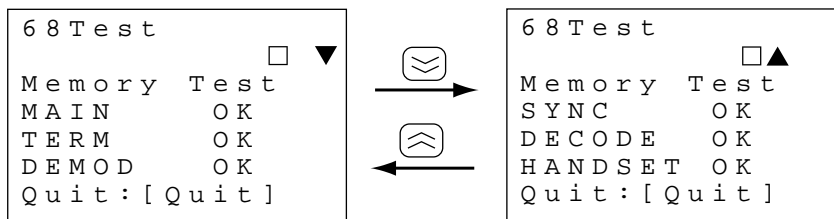
xx = Program Version No.

*Program version no. list printout*

**8.3.3 Memory test**

1. Press the [2] key at the Test menu.
2. Press the [Ent] key to start the test.

The test results, OK or NG (No Good), are shown on the display. For any NG contact your dealer for advice. After the results appear you may print them by using the [HOLD Print] key.



*Memory test results*

3. Press the [FUNC Quit] key several times.

**Printing the memory test results**

Press the [HOLD Print] key at the memory test display to print the memory test results.

```

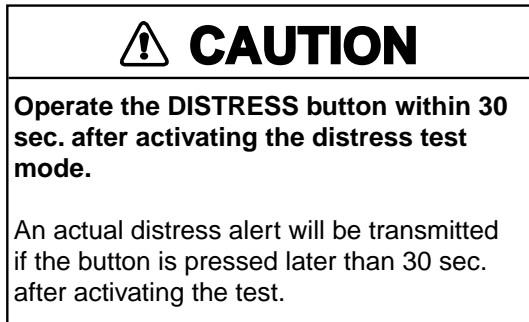
----- 68 Memory Test <2000-06-20 00:00(UTC)> -----
- TEST RESULT -
MAIN          OK                    DEMOD          OK
TERM          OK                    SYNC           OK
HANDSET       OK                    DECODER        OK
ANTENNA       OK
    
```

*Memory test printout*

**Note:** The memory can also be tested from the terminal unit. The keying sequence is [F4], [6], [Enter], [Y] and [Enter].

### 8.3.4 Distress test

The distress test checks the telex and telephone DISTRESS buttons for proper operation.



#### Telephone distress test

1. Press the [3] key at the Test menu.

```

6 8 T e s t
D i s t r e s s   T e s t
S t a r t   O K ?
S t a r t : [ E n t ]

```

*Distress start prompt*

2. Press the [Ent] key to start the test.



```

2 0 0 0 - 0 8 - 2 9
1 2 : 3 4   U T C
D I S T R E S S
TEST MODE
Y | | A O R E   R e a d y

```

*Distress mode activated*

**Note:** The distress test is automatically cancelled after 30 seconds. For this reason complete the next step within 30 seconds.

3. **Handset IB-882:** Open the distress button cover on the IB-362 and press the [DISTRESS] button six seconds.  
**Handset IB-882-362:** Open the distress button cover on the hanger and press the [DISTRESS] button six seconds.
4. Press the  key.
5. Key in LES and press the [#] key.
6. Press the  key when you hear the guidance.

### **Telex distress test**

1. Press the [3] key at the Test menu.
2. Press the [Ent] key to start the test.

**Note:** The distress test is automatically cancelled after 30 seconds. For this reason complete the next step within 30 seconds.

3. Open the distress button cover on the IB-352 and press the [DISTRESS] six seconds. A distress test message is automatically sent.
4. When you receive a message from the LES, press [F10] on the terminal unit keyboard to disconnect the line.

## **8.4 Restoring Default Settings**

You may clear all data and logs from the handset to start operation anew with default settings. This procedure is done from the Administration mode. See page 2-10 for how to choose the Administration mode.

1. Press [FUNC Quit], [6], [9] to display the Initialize display.

```
6 9 Initialize
All data & logs
are cleared.
ARE YOU SURE?
Clear: [ 8 2 ]
Quit: [ Quit ]
```

*Initialize display*

2. Press [8], [2] to clear. "Now Initializing" appears while data is being cleared. After default settings are restored the standby display appears.

## 8.5 Antenna Orientation (for technicians)

This procedure is intended for use by the service technician. The operator should not attempt to orient the antenna manually; communications may not be possible if the antenna is incorrectly oriented. This procedure is done from the Administration mode. See page 2-10 for how to choose the Administration mode.

1. Press [FUNC Quit], [5] and [3] to show the Antenna menu.

```

5 3 Antenna
Azimuth   : 000
Elevation : 00
Heading   : 000
Autotrack : ON
Enter : [Ent]

```

### *Antenna menu*

2. Select Azimuth, enter azimuth (000-359) and press the [↵] key.
3. Select Elevation, enter elevation (00-90) and press the [↵] key.
4. Select Heading, enter heading (000-359) and press the [↵] key.
5. Select AutoTrack and press the [↵] key to select OFF.
6. Press the [Ent] key. (If invalid data is found the message "Input Error! Input data is invalid." appears for about three seconds and then the main menu is displayed.)
7. Press the [FUNC Quit] key to close the menu.

## 8.6 Error Messages at the Terminal Unit

The tables which follow show the error messages which may appear on the terminal unit.

### 8.6.1 Call failure

#### Call failure error messages

Error Messages	Reason	Remedy
Call failed, request data invalid. (4561) Call failed, insufficient digits in service address. (4562) Call failed, invalid service address. (4563) Call failed, invalid credit card data. (4564) Call failed, credit card type not acceptable at this LES. (5522) Call failed, credit card not accepted. (5539) Call failed, selected LES is not valid. (0049)	<ul style="list-style-type: none"> <li>• Wrong LES or subscriber number.</li> <li>• Wrong card number in case of credit card.</li> </ul>	Redial.
Call failed, long interruption in reception at MES. (4962)	Unstable reception (MES not synchronized with satellite.)	Change satellite or LES.
Call failed, LES time-out (no assignment). (5569) Call failed, LES time-out (invalid assignment). (5585) Call failed, LES time-out (no service address). (5570) Call failed, LES time-out (no scrambling vector). (5571) Call failed, LES time-out (no credit card data). (5573) Call failed, LES time-out (no return carrier identifier). (5574) Call failed, LES time-out (no MES connect). (5575) Call failed, LES time-out (no answer). (7969) Call failed, long interruption in reception at LES. (5729) Call failed, LES time-out (no MES SCPC carrier). (5826) Call failed, LES time-out (no MES telex carrier). 85825) Call failed, LES time-out (no telex answerback). (5576)	Unstable communications (LES cannot receive reply from ship.)	
Call failed, MES time-out (no scrambling vector ack). (4801) Call failed, MES time-out (no credit card accepted message). (4802) Call failed, MES time-out (no terrestrial answer). (4803) Call failed, MES time-out (no ship terminal answer). (4129)	Unstable communications (MES cannot receive reply from LES.)	
Call failed, service not authorised at this LES. (5538) Call failed, service not provided at this LES. (5505) Call failed, service temporarily not available at this LES. (5521) Call failed, no service and no scrambling vector. (5572) Call failed, bulletin board update commenced. (0051) Call failed, call request failure by LES. (0052)	LES does not offer requested service.	

*(Continued on next page)*



*Call failure error message (con't)*

Error Message	Reason	Remedy
Call failed, LES congested (no channel unit). (5713) Call failed, terrestrial circuits congested. (5201) Call failed, LES congested (no channel and no circuit). (5202) Call failed, LES congested (no channel). (5457) Call failed, LES congested (no time-slot). (5458) Call failed, terrestrial party busy. (7953) Call failed, terrestrial circuit failure. (8033) Call failed, terrestrial party cleared before MES connection.(8034) Call failed, set-up between LES and terrestrial circuits failed. (7265)	<ul style="list-style-type: none"> <li>• Line is busy.</li> <li>• Line trouble.</li> </ul>	Try again a little while later.
Call failed, MES not authorised at this LES. (5537)	Ship's answerback code not properly entered.	Contact your dealer.
Call failed, shore distress call being setup. (0055) Call failed, Distress call in progress. (0062) Call failed, Higher priority call received. (0063) Call failed, Call in progress. (0064)	Call of higher priority in progress.	Try again a little while later.
Call failed, MES busy. (0060) Call failed, MES terminal not enabled. (0061)	MES not ready for communications.	Try again a little while later.
Call failed, Hardware abnormality. (4241) Call failed, antenna circuit abnormality. (0032) Call failed, no channel assignment received from LES. (0033) Call failed, invalid power level assignment. (0034) Call failed, RX DEMOD circuit abnormality. (0035) Call failed, TX MOD circuit abnormality. (0036) Call failed, RX-RF circuit abnormality. (0037) Call failed, TX-RF circuit abnormality. (0038) Call failed, Selectively cleared by LES. (0039) Call failed, no distress service avail. in this OR. (0040) Call failed, MES unable to sync. to NCSA in time. (0041) Call failed. (0042)	Equipment trouble*	Contact your dealer.

\* = Another error message accompanies these messages and is printed out.  
 Trouble can be determined from the printout.

**Note 1:** Number in parentheses is error message number.

**Note 2:** Wait 30 seconds before calling again.

## 8. MAINTENANCE, TROUBLESHOOTING

### 8.6.2 Antenna trouble

#### *Antenna trouble error message*

Error Message	Meaning	Cause	Remedy
OR Change failed. (0100)	Satellite selected from Satellite menu not acquired.	Satellite is tracked based on ship's position.	<ul style="list-style-type: none"> <li>• Select correct satellite.</li> <li>• Check navigator.</li> </ul>
Sky Scan failed. (0108) Sky Scan halted. (0109) Sky Scan disabled.(0110)	Satellite not found although all areas searched.	Search automatically stopped. (Equipment trouble or object in transmission path of satellite)	Contact your dealer.
OR Search failed. (0103) OR Search halted. (0104) OR Search disabled. (0105)	Couldn't search for satellite.		
Step-track failed. (01012) Step-track halted. (0113)	Step track problem.	Equipment problem	Contact your dealer.
Step-track out of bounds. (0114)	Satellite lost during step tracking.	Search again after waiting five minutes.	<ul style="list-style-type: none"> <li>• Select correct satellite.</li> <li>• Check navigator.</li> </ul>

### 8.6.3 Printer trouble

#### *Printer trouble error message*

Error Message	Cause	Remedy
CAUTION: Main Unit Printer error: off-line. (0169) CAUTION: Main Unit Printer error: out of paper. (0170) CAUTION: Main Unit Printer error: no connection. (0171)	Printer error	Check connection, paper, etc.

**8.6.4 Communication unit trouble (internal)***Communication unit trouble error messages*

Error Message	Cause	Remedy
ALARM: ADE Non-carrier EIRP abnormality. (0139)	PCU detects EIRP trouble during standby.	Contact your dealer.
ALARM: ADE EIRP power too low. (0140)	HPA output at Tx is below ratings.	
ALARM: ADE EIRP power too high. (0141)	Output power too high at Tx.	
ALARM: ADE EIRP burst too long. (0142)	PCU detects abnormal Tx burst width.	
ALARM: ADE RF abnormality - No TX power detected. (0143)	PCU cannot detect HPA output power.	
ALARM: ADE HPA deactivated during transmission. (0144)	HPA trouble	
ALARM: TX Synthesizer unlock. (0145)	Unlock signal detected.	
ALARM: RX Synthesizer unlock. (0146)		
ALARM: Cross EL axis control error. (0147)	Cross EL axis control trouble	
ALARM: Az axis control error. (0148)	AZ axis control trouble	
ALARM: El axis control error. (0149)	EL axis control trouble	
ALARM: 28V power abnormality. (0154)	+28 V not output.	
ALARM: RF-CONV circuit abnormality, TX-RF level insufficient.(0160)	RF CONV Board trouble, TXRF level insufficient.	
ALARM: RF-CONV circuit abnormality, TX-RF level too high. (0161)	RF CONV Board trouble, TXRF level too high	
ALARM: RF-CONV circuit abnormality, Unexpected TX-RF level detected. (0162)	RF CONV Board trouble, TXRF level error detected	
ALARM: AGC level abnormality. (0163)	AGC level error	
ALARM: TX-RF circuit abnormality, TX power insufficient. (0164)	Output power at Tx insufficient.	
ALARM: TX-RF circuit abnormality, TX power too strong. (0165)	Output power at TX too high.	
ALARM: TX circuit abnormality, unexpected TX power detected. Please power off the FELCOM82!! (0166)	EIRP trouble detected for period more than 3 sec. at standby.	
ALARM: Telephone Distress Box Cable abnormality. (0167)	Cable for telephone distress button may be damaged or disconnected.	
ALARM: Telex Distress Alert Box Cable abnormality. (0168)	Cable for telex distress button may be damaged or disconnected.	
ALARM: FAN FAILURE (0174)	Trouble with fan for power supply	

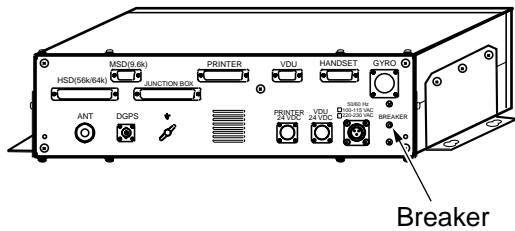
*(Continued on next page)*

*Communication unit trouble error messages (con't)*

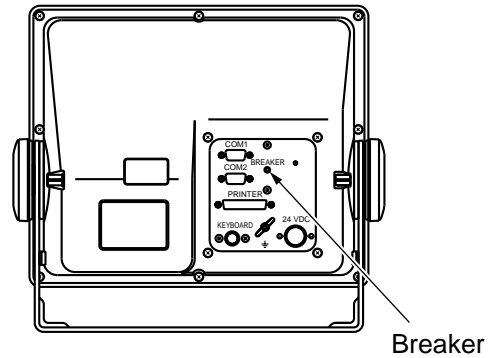
Error	Cause	Remedy
ALARM: SYSCPU error detected. (0176)	CPU error	Contact your dealer.
ALARM: HANDSET error detected. (0177)		
ALARM: DEMOD-CPU error detected. (0178)		
ALARM: SYNCCPU-CPU error detected. (0179)		
ALARM: DECODER-CPU error detected. (0180)		
ALARM: TERM-CPU error detected. (0181)	Antenna Error	
ALARM: ANTENNA error detected. (0182)		

### 8.7 When the Power Cannot be Turned On

The communication unit and terminal unit have a (red) breaker switch on their rear panel. If power cannot be supplied, press the breaker switch to restore normal operation.



Communication Unit

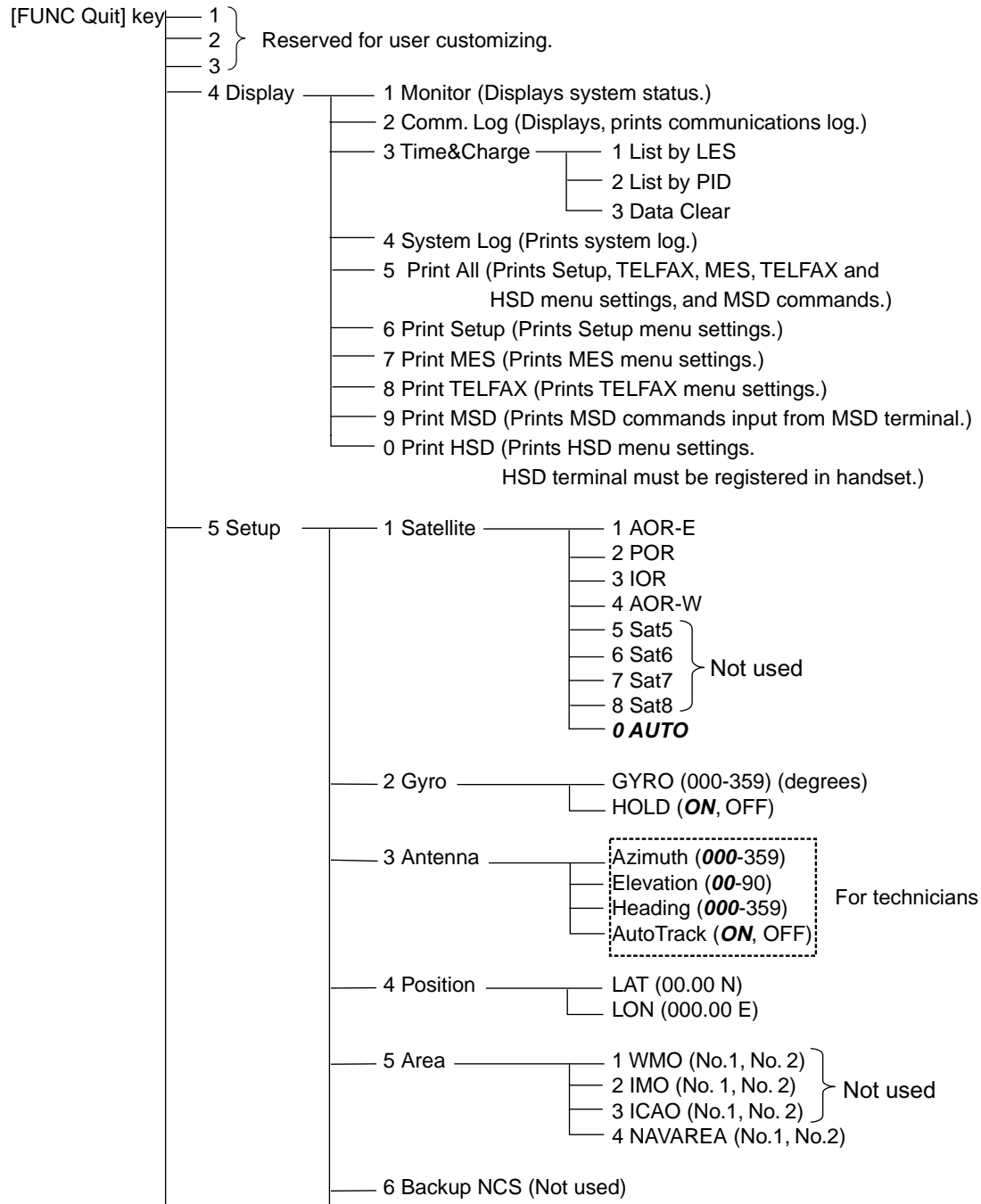


Terminal Unit

*Location of breaker*

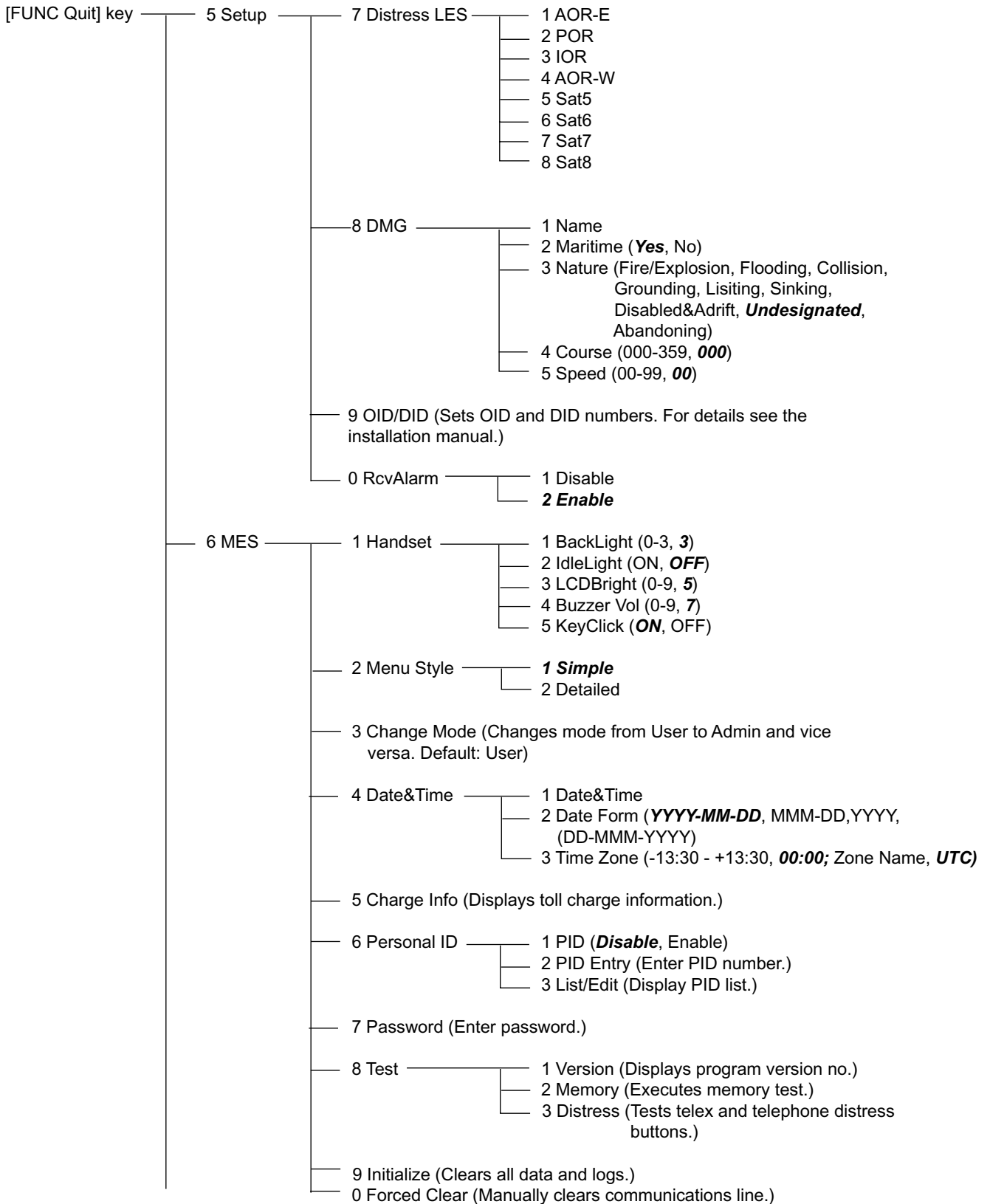
# APPENDIX A Menu Overview

## Handset

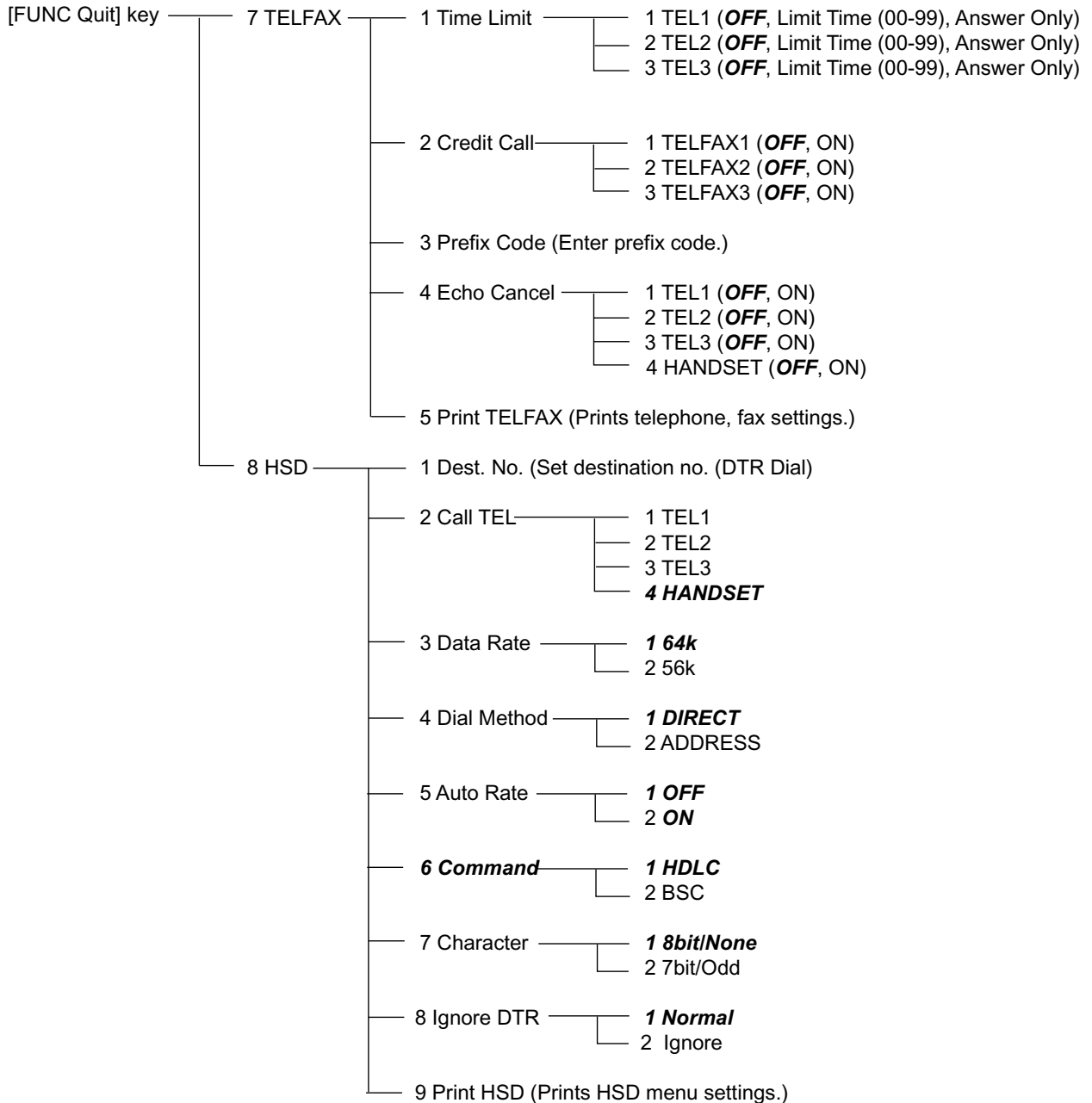


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# APPENDIX A Menu Overview



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- [ABBR FIND] key  
(Press [\*] after [ABBR FIND].)
- 1. Entry (Registers abbreviated dialing numbers.)
  - 2. Edit\* (Edits abbreviated dialing numbers.)
  - 3. Remove\*\* (Deletes abbreviated dialing numbers.)
  - 4. HSD Call

\* Not displayed when no abbreviated dialing numbers are registered.

\*\* Not displayed unless HSD OID/DID number is registered and HANDSET is selected at the Call TEL menu.

## Terminal Unit (Class 1 only)

### [F1] (File)

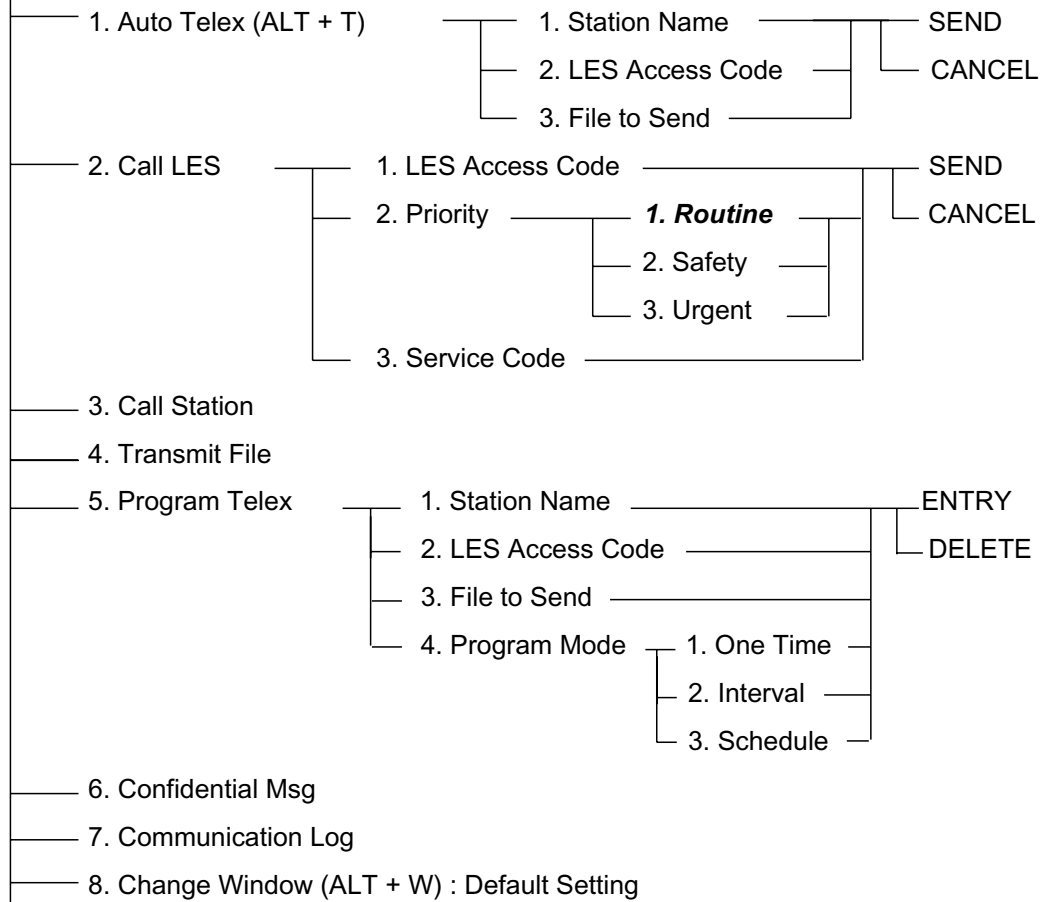
- 1. New Text (ALT + N)
- 2. Open Text (ALT + O)
  - Load
  - Merge
- 3. Close Text (ALT + Q)
- 4. Save Text (ALT + S)
- 5. Delete File (ALT + D)
- 6. Rename File
- 7. Print File (ALT + P)
- 8. Clear Comm Memory
- 9. Format Disk

### [F2] (Edit)

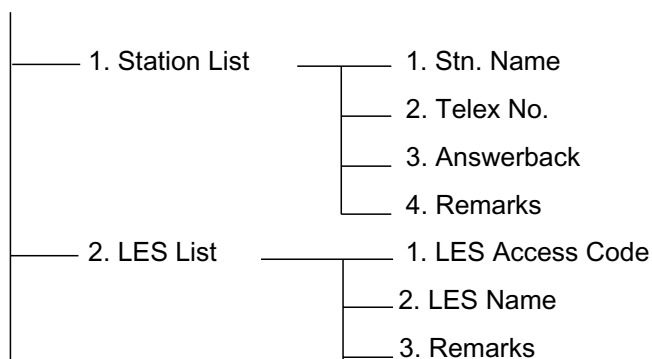
- 1. Undo (ALT + X)
- 2. Cut (DEL)
- 3. Copy (ALT + C)
- 4. Paste (INS)
- 5. Select All (ALT + A)
- 6. Search (ALT + F)
  - Forward
  - Backward
- 7. Replace (ALT + R)
  - Forward
    - Query
    - All
  - Backward
- 8. Goto Top (HOME)
- 9. Goto Bottom (END)
- A. Goto Line (ALT + L)
- B. Change Text (ALT + V)



[F3] (Telex)

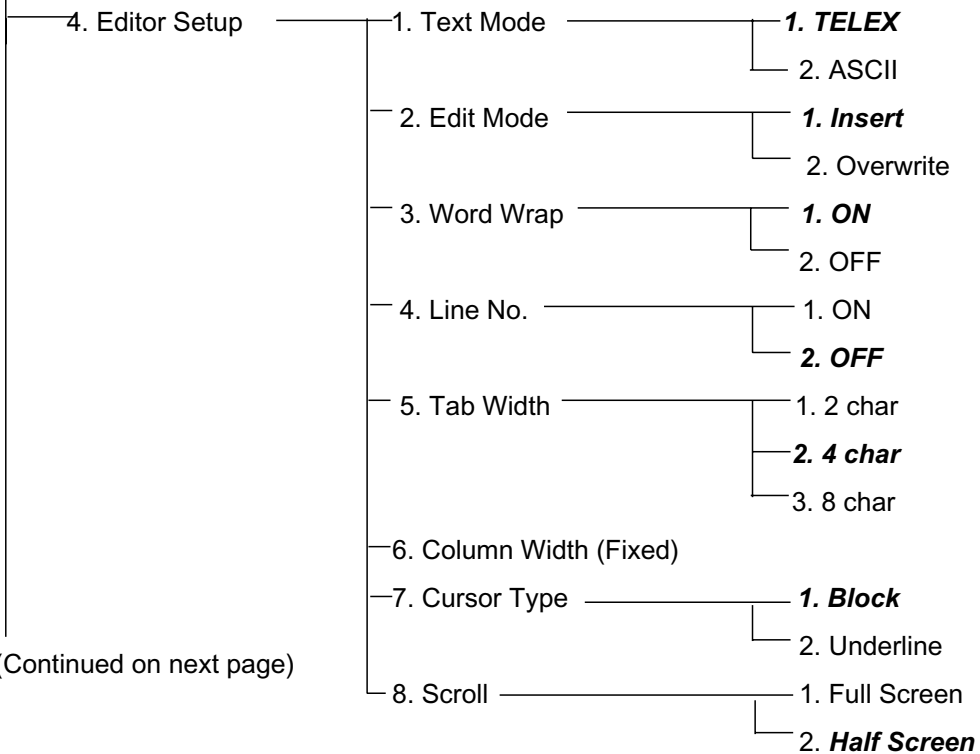
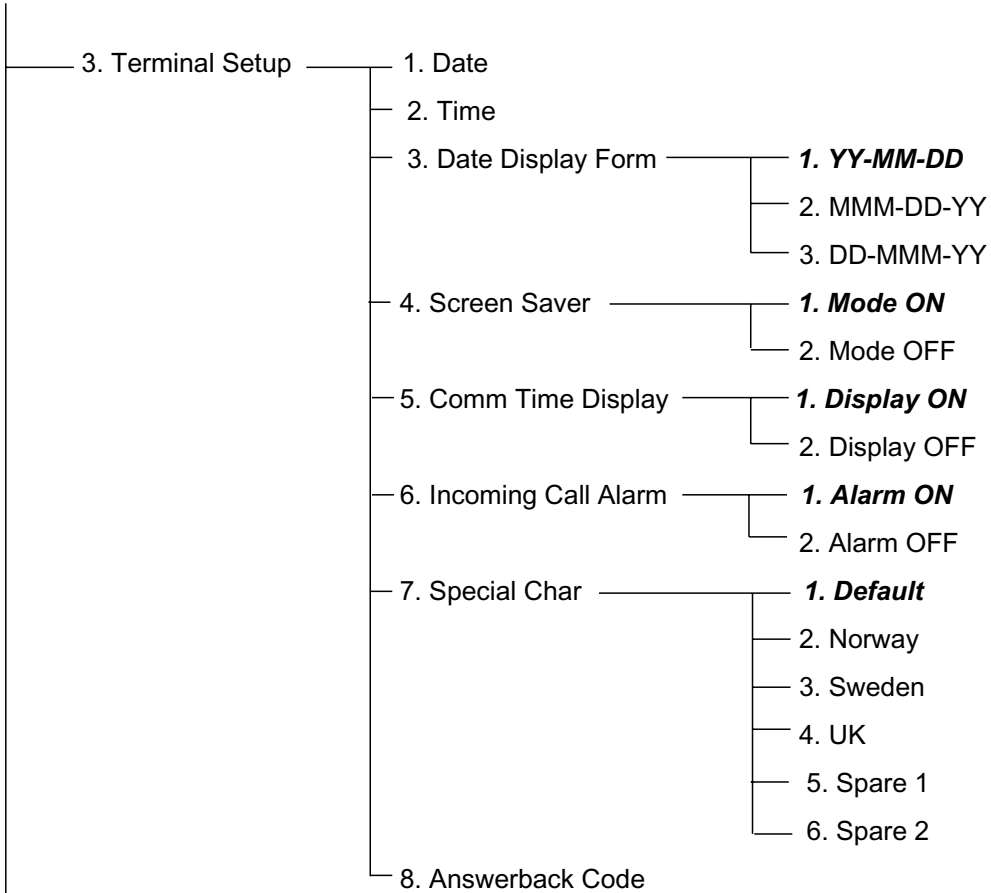


[F4] (Setup)



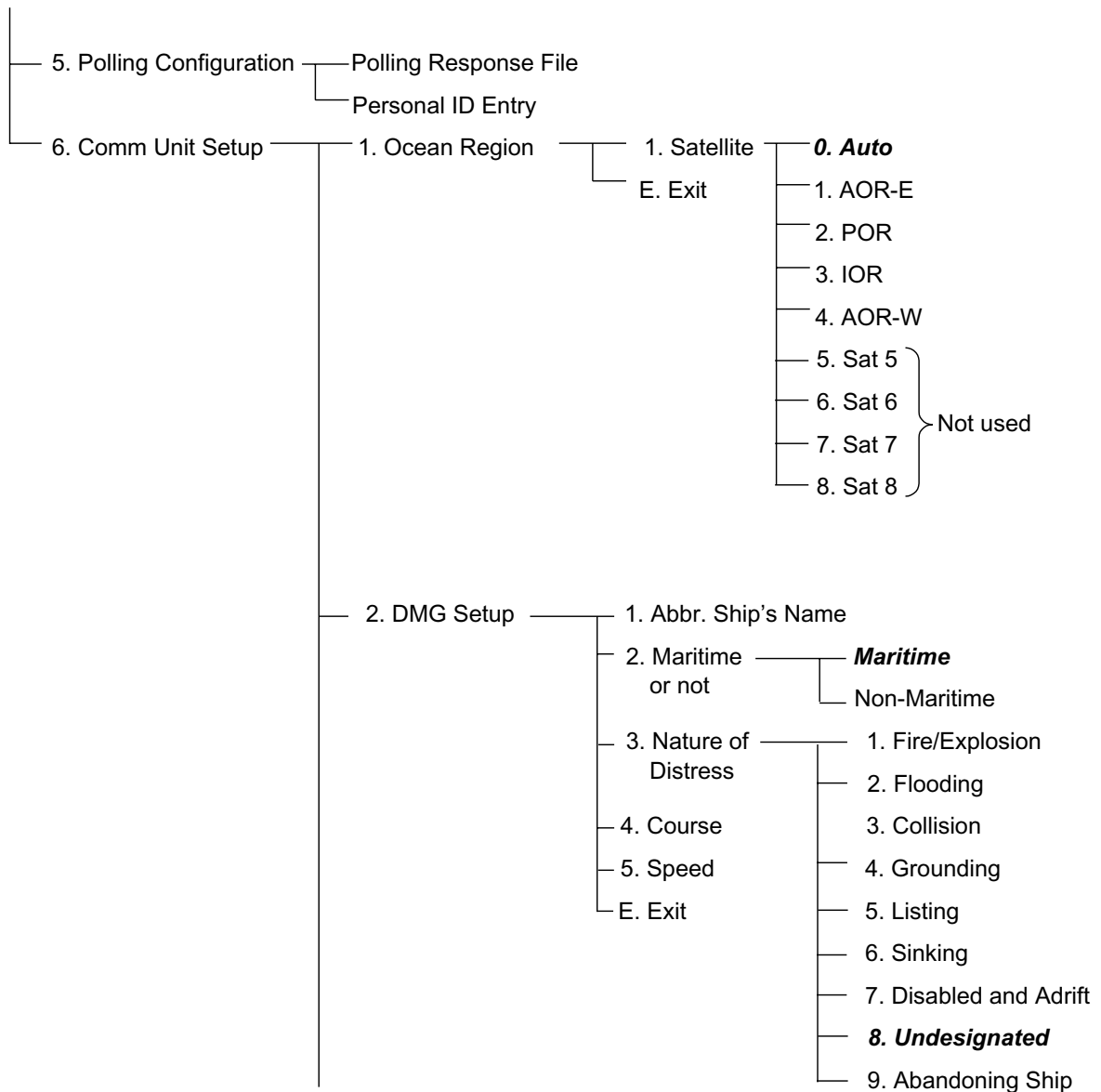
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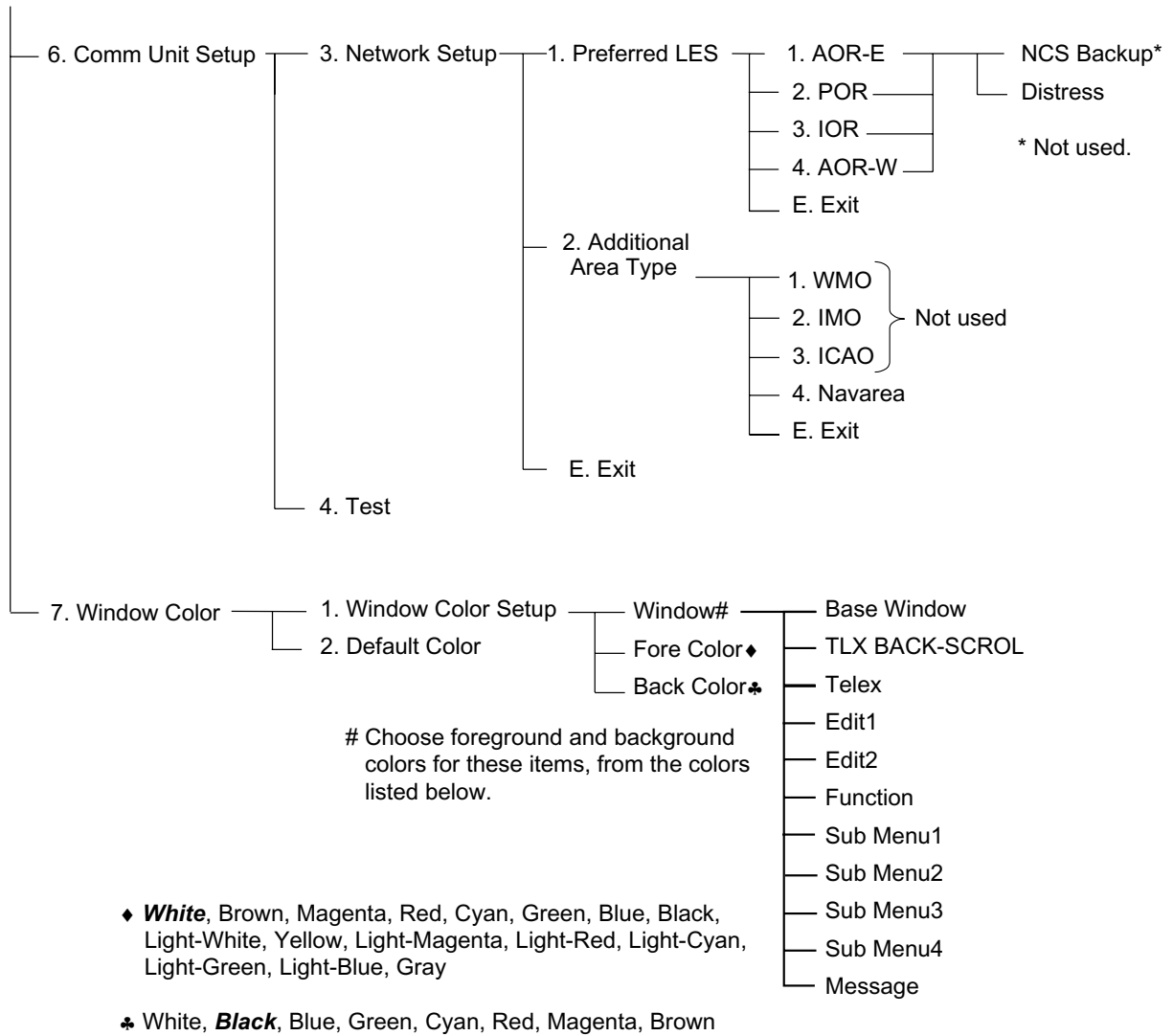
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# APPENDIX A Menu Overview

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# APPENDIX B

## Telephone, Telex Country Code Lists

Area and Country	Telephone Country Code	Telex Country Code	Remarks for Telex Code
Afghanistan	93	79	
Alaska	1	200	
Albania	355	604	
Algeria	21	408	
American Samoa	684	770	
American Virgin Is.	1	208	Telex calls to former WUI subscribers, insert the figure "9" after the destination code "208".
Andorra	33	590	
Angola	244	991	
Anguilla	1	391	
Antigua & Barbuda	2	393	
Argentina	54	33	Disregard the figure "0" at head of subscriber number.
Armenia	7	684	
Aruba	297	303	Subscriber numbers are 2XXX or 5XXX
Ascension	247	939	Manual calls 3XXX
Australia	61	71	
Australian External Territories	672	766	
Austria	43	47	
Azerbaijani	994	784	
Azores Is.	351	404	Destination code is the same as for Portugal.
Bahamas	1	297	
Bahrain	973	490	
Bangladesh	880	780	
Barbados	1	392	
Belarus	7	681	
Belgium	32	46	
Belize	501	371	
Benin	229	972	
Bermuda	1	290	
Bhutan	975	890	
Bolivia (Rep. of)	591	371	
Bolivia (ENTAL)		309	
Bosnia-Herzegovina	387	600	
Botswana	267	962	
Brazil	55	38	Disregard the figure "0" at head of subscriber number.
British Virgin Is.	1	292	
Brunei Darussalam	673	809	
Bulgaria	359	67	
Burkina Faso	226	978	
Burundi	257	903	

APPENDIX B Telephone, Telex Country Code Lists

Area and Country	Telephone Country Code	Telex Country Code	Remarks for Telex Code
Cambodia	855	807	Kampuchea Rep.
Cameroon	237	970	
Canada	1	{ 21 26	Disregard the figure "0" at head of subscriber number.
Canary Is.	34	52	Destination code is the same as for Spain.
Cape Verde	238	993	
Cayman Is.	1	293	
Central Africa Rep.	236	971	
Chad	235	976	
Chile	56	34	{ TCH subscribers 2XXXXXX ENTEL subscribers 5XXXXXX TRA subscribers 3XXXXXX TECOM subscribers 6XXXXXX VTR CM subscribers 4XXXXXX
China	86	85	
Christmas Is. (Aus)	672	766	
CIS (formerly USSR)	7	64	
Cocos-Keeling Is.	672	766	
Colombia	57	35	Disregard the figure "0" at head of subscriber number.
Comoros	269	994	Manual calls
Congo	242	981	
Cook Is.	682	772	
Costa Rica	506	376	
Cote d' Ivoire	225	983	Ivory Coast
Croatia	385	599	
Cuba	53	28	
Cyprus	357	605	
Czechoslovakia	42	66	
Denmark	45	55	
Diego Garcia	246	938	
Djibouti	253	979	
Dominica	1	394	
Dominican Rep.	1	{ 201 202 241	RCA subscribers 4XXXXXX For subscriber number beginning with 346, disregard "346" at head of subscriber number. AGEM IR subscribers 61XX
Ecuador	593	308	
Egypt	20	91	
El Salvador	503	373	
Estonia (formerly USSR)	372	537	
Ethiopia	251	980	

APPENDIX B Telephone, Telex Country Code Lists

Area and Country	Telephone Country Code	Telex Country Code	Remarks for Telex Code
Falkland Is. (Malvinas)	500	306	
Faroe Is.	298	502	
Fiji	679	701	
Finland	358	57	
France	33	42	
French Guiana	594	300	
French Polynesia	689	702	
Gabon	241	973	
Gambia	220	996	
Georgia	7	683	
Germany (Fed, Rep. of)	49	{ 69 41	formerly East Germany
	49		formerly West Germany
Ghana	233	94	
Gibraltar	350	405	
Greece	30	601	
Greenland	299	503	
Grenada	1	395	
Guadeloupe	590	299	
Guam (RCA)	671	700	
Guatemala	502	372	
Guiana	594	300	
Guinea Conakry	224	995	Manual calls
Guinea Bissau	245	969	
Guyana	592	295	
Haiti	509	203	RCA subscribers 9XXX
Hawaii	1	{ 704 705 708 709 (773)	RCA subscribers 8XXX or 2968XX
			ITT subscribers 743XXX
			WUI subscribers 63XXX or 63XXXX
			WUH subscribers 39XXXX
			Telex calls to HTC subscribers can be made using Semi-automatic calls.
Honduras	504	374	
Hong Kong	852	802	
Hungary	36	61	
Iceland	354	501	
India	91	81	
Indonesia	62	73	Disregard the figure "0" at head of subscriber number.
Iran	98	88	
Iraq	964	491	
Ireland	353	500	
Israel	972	606	Disregard the figure "0" at head of subscriber number.
Italy	39	43	

APPENDIX B Telephone, Country Code Lists

Area and Country	Telephone Country Code	Telex Country Code	Remarks for Telex Code
Jamaica	1	291	
Japan		72	KDDI (for 5 digits)
	81	720	NTT
Jordan	962	493	
Kazakhstan	7	785	
Kenya	254	987	
Kiribati	686	761	Subscriber numbers are 770XX
Korea (Demo. People's Rep. of)	850	(899)	
Korea (Rep. of)	82	801	
Kuwait	965	496	
Kyrgyzstan	7	788	
Lao	856	804	
Latvia (formerly USSR)	371	538	
Lebanon	961	494	
Lesotho	266	963	
Liberia	231	997	
Libya	21	901	
Liechtenstein	41	45	
Lithuania (formerly USSR)	370	539	
Luxembourg	352	402	
Macao	853	808	
Macedonia	389	597	
Madagascar	261	986	Subscriber number beginning with 4, 5, 7, 8 and 9 can be reached by Manual Calls.
Madeira Is.	351	404	Destination code is the same as for Portugal.
Malawi	265	904	
Malaysia	60	84	
Maldives Is.	960	896	
Mali	223	985	
Malta	356	406	Subscriber number beginning with 11XX can be reached by Semi-automatic calls.
		403	
Mariana Is.	671	760	
Marshall Is.	692	765	
Maritinique	596	298	
Mauritania	222	974	
Mauritius	230	966	
Mexico	52	22	Disregard the figure 000 at head of subscriber number.
Micronesia	691	764	
Moldova	373	682	
Monaco	33	42	Destination code is the same as for France.
Mongolia	976	800	



APPENDIX B Telephone, Telex Country Code Lists

Area and Country	Telephone Country Code	Telex Country Code	Remarks for Telex Code
Montserrat	1	396	
Morocco	21	407	
Mozambique	258	992	
Myanmar (formerly Burma)	95	83	
Namibia	264	908	
Nauru	674	775	
Nepal	977	891	
Netherlands	31	44	
Netherlands Antilles	599	390	
New Caledonia	687	706	
New Zealand	64	74	
Nicaragua	505	375	
Niger	227	975	2XXXX other numbers are for Semi-automatic calls.
Nigeria	234	905	
Niue Is.	683	776	
Northern Mariana Is.	670		
Norfolk Is.	672	766	
Norway	47	56	
Oman	968	498	
Pakistan	92	82	
Palau	680	763	
Panama	507	{ 377 378 379	TRT subscribers AACR subscribers INTEL subscribers
Papua New Guinea	675	703	
Paraguay	595	305	
Peru	51	36	
Philippines	63	75	{ PHILCOM subscribers 2XXXX RCPI subscribers 7XXXX GMCR subscribers 4XXXX ETPI subscribers 6XXXX CAPWIRE subscribers 1XXXX For PTT subscribers, insert the figure "8" after the destination code "75".
Poland	48	63	Disregard the figure "0" at head of subscriber number.
Portugal	351	404	
Puerto Rico	1	{ 205 206 207 209	RCA subscribers 2XXX ITT subscribers 345XXX C&W, WUI subscribers ACPR (PRCA) subscribers
Qatar	974	497	

APPENDIX B Telephone, Country Code Lists

Area and Country	Telephone Country Code	Telex Country Code	Remarks for Telex Code
Reunion	262	961	Subscriber numbers are 916XXX
Romania	40	65	Disregard the figure "0" at head of subscriber number.
Russian Federation	7	64	
Rwanda	250	909	
Saipan	670	760	
San Marino	378	505	
Sao Tome & Principe	239	967	Manual calls
Saudi Arabia	966	495	
Senegal	221	906	
Seychelles	248	965	
Sierra Leone	232	998	
Singapore	65	87	
Slovak	42	66	
Slovenia	386	598	
Solomon Is.	677	778	
Somalia	252	900	
South Africa	27	95	{ Cape Town subscribers XXXXXX Bophuthatswana subscribers 08XXXX Transkei subscribers 09XXXX
Spain	34	52	
Spanish North Africa	34	52	
Sri Lanka	94	803	
St. Helena	290	(960)	Manual calls 4XXX
St. Kitts & Nevis	1	397	
St. Lucia	1	398	
St. Pierre & Miquelon	508	204	
St. Vincent & the Grenadines	1	399	
Sudan	249	984	
Suriname	597	304	
Swaziland	268	964	
Sweden	46	54	
Switzerland	41	45	
Syria	963	492	
Tajikistan	7	787	
Taiwan	886	769	
Tanzania	255	989	
Thailand	66	86	
Togo	228	977	
Tokelau	690	762	
Tonga	676	777	
Trinidad & Tobago	296	294	
Tunisia	21	409	
Turkey	90	607	
Turkmenistan	7	789	

APPENDIX B Telephone, Telex Country Code Lists

Area and Country	Telephone Country Code	Telex Country Code	Remarks for Telex Code
Turks & Caicos Is.	1	296	
Tuvalu	688	774	
U. A. E.	971	893	
Abu Dhabi			2XXXX, 3XXXX, 5XXXX
Ajman			695XX
Dubai			4XXXX
Fujairah			8XXXX
Ras Al Khaimah			9XXXX
Sharjah			68XXX
Umm Al Qaiwain			697XX
Uganda	256	988	
Ukraine	7	680	
United Kingdom	44	51	
United Arab Emirates	971	893	
Upper Volta	226	978	Same as ÒBurkina FasoÓ.
Uruguay	598	32	
Uzbekistan	7	786	
U. S. A.	1	23	{ CCI subscribers 7XXXXXX ITT subscribers 4XXXXX, 4XXXXXX, 4XXXXXXXXXX RCA subscribers 2XXXXX WUI subscribers 6XXXX, 6XXXXX, 6XXXXXX
U. S. A. (Mainland)		{ 23	{ TRT subscribers 1XXXXX, 1XXXXXXXXXX FTCC subscribers 8XXXX, 8XXXXX GRPHNET subscribers 36XXXXX, 37XXXXX For WUT subscribers, insert the figure "0" after the destination code "23".
		{ 25	{ Telex calls to TWX subscribers whose numbers do not contain "0" as the third figure of the 10 figure code can be made as Semi-automatic calls.
U. S. S. R. (Former)	7	640	Russian Federation
Vanuatu	678	771	
Vatican	379	504	
Venezuela	58	31	
Viet Nam	84	805	Subscriber number beginning with 561XXX can be made using manual calls
Wallis & Futuna Is.	681	707	
Western Samoa	685	779	
Yemen (Rep. of)	969	806	Formerly Yemen (P. D. Rep. of)
Yugoslavia (Former)	967	895	Formerly Yemen (Arab Rep.)

APPENDIX B Telephone, Country Code Lists

<b>Area and Country</b>	<b>Telephone Country Code</b>	<b>Telex Country Code</b>	<b>Remarks for Telex Code</b>
Zaire	243	982	Telex calls to places other than Kinshasa Subscriber beginning with 2XXXX can be made as Semi-automatic calls.
Zambia	260	902	
Zanzibar	259	990	
Zimbabwe	263	907	
<b>Ocean Area</b>	<b>Telephone Ocean Region Access Code</b>	<b>Telex Ocean Region Access</b>	<b>Remarks</b>
AOR-W	874	584	Atlantic Ocean-W
AOR-E	871	581	Atlantic Ocean-E
POR	872	582	Pacific Ocean
IOR	873	583	Indian Ocean

# APPENDIX C

## LES ACCESS CODE LIST

### LES code list (4/2002)

Land earth station operator	Country	AOR- E	AOR- W	IOR	POR
Beijing Marine	China			311	211
Bezeq	Israel	127		327	
CAT	Thailand			319	
CP Radio Marconi	Portugal	118			
Embratel	Brazil	114			
France Telecom	France	121	021	321	221
France Telecom (Ex DeteSat)	France	115		333	
KDDI	Japan	103	003	303	203
Korea Telecom	South Korea			308	208
Morviasputnik (Nudel Les)	Russia	117		317	
OTE	Greece	120		305	
Polish Telecom	Poland	116		316	
Saudi Telecom Co	Saudi Arabia	125		325	
Singapore Telecom	Singapore			328	210
Stratos Mobile Networks	Canada	102	002	302	202
Telecom Company of Iran	Iran			314	
Telecom Italia	Italy	105		335	
Telenor Satellite Services Inc	USA	101	001		201
Telenor Satellite Services AS	Norway	104	004	304	204
Turk Telecom	Turkey	110		310	
Vishipel	Vietnam			330	
VSNL	India			306	
Xantic	Netherlands	112	012	312	212
Xantic	Australia	122	022	322	222

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# APPENDIX D

## Telex Abbreviations, International Telegraphy Alphabet

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### Telex Abbreviations

Abbreviation	Meaning
ADV	Advise
ACK	Acknowledge
AGN	Again
BI (GS)	Good bye
BK	I cut off.
CFN	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
P (RCD)	Received
RAP	I will call you again.
RD	Reed
RE	Referring 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

## International Telegraphy Alphabet

No.	FIGURES	LETTERS	No.	FIGURES	LETTERS
1	–	A	17	1	Q
2	?	B	18	4	R
3	:	C	19	Õ	S
4	⊕	D	20	5	T
5	3	E	21	7	U
6	□	F	22	=	V
7	■	G	23	2	W
8	◻	H	24	/	X
9	8	I	25	6	Y
10	BELL	J	26	+	Z
11	(	K	27	CARRIAGE RETURN	
12	)	L	28	LINE FEED	
13	.	M	29	LETTERS	
14	,	N	30	FIGURES	
15	9	O	31	SPACE	
16	0	P	32	BLANK	

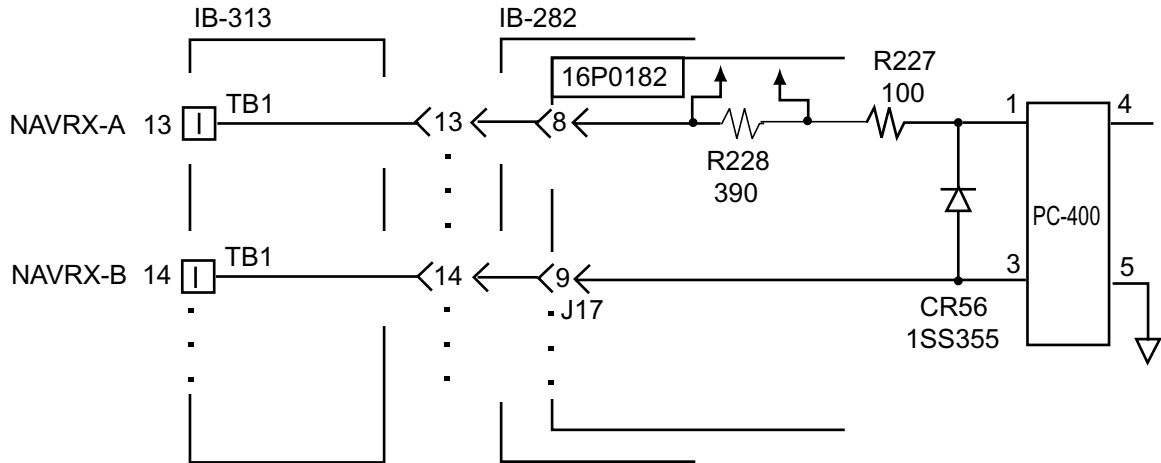


# APPENDIX E DIGITAL INTERFACE (IEC 61162-2)

## Input sentences

GGA, GLL, RMA, RMC, ZDA, VTG, RMB, WPL, MTW, DBT, VDR, BWC, BWR

## Schematic diagram of NAV IN port



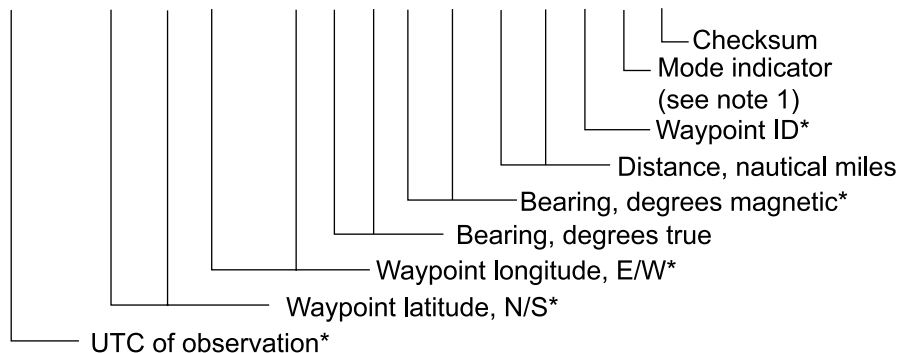
## Load requirements

Isolation: Optocoupler  
 Input Impedance: 100 ohm  
 Max .voltage:  $\pm 15$  V

**Data sentences: input**

**BWC – Bearing and distance to waypoint**

\$--BWC, hhmss.ss, IIII.II, a yyyyy.yy, a, x.x, T, x.x, M, x.x, N, c--c, a\*hh<CR><LF>



\*: Not used

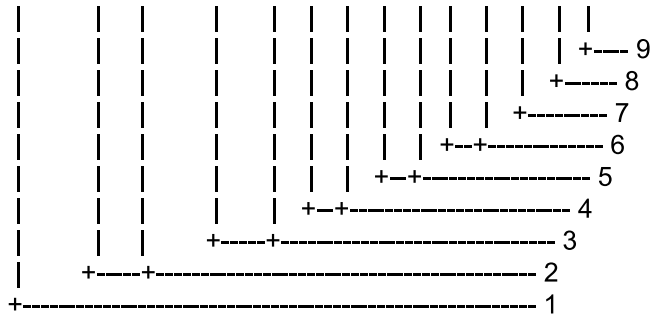
NOTE 1: Positioning system Mode indicator:

- A = Autonomous
- D = Differential
- E = Estimated (dead reckoning)
- M = Manual input
- S = Simulator
- N = Data not valid

The Mode indicator field shall not be a null field.

**BWR – Bearing and distance to waypoint – rhumb line**

\$--BWR,hhmmss.ss,III.III,a,yyyyy.yyy,a,x.x,T,x.x,M,x.x,N,c--c,a\*hh<CR><LF>



1. UTC of observation
2. Waypoint latitude, N/S
3. Waypoint longitude, E/W
4. Bearing, degrees true
5. Bearing, degrees magnetic
6. Distance, nautical miles
7. Waypoint ID
8. Mode indicator(see note)
9. Checksum

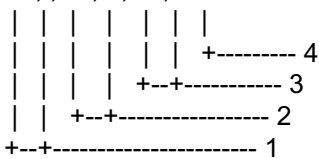
NOTE Positioning system Mode indicator:

- A = Autonomous
- D = Differential
- E = Estimated (dead reckoning)
- M = Manual input
- S = Simulator
- N = Data not valid

The Mode indicator field shall not be a null field.

**DBT – Depth below transducer**

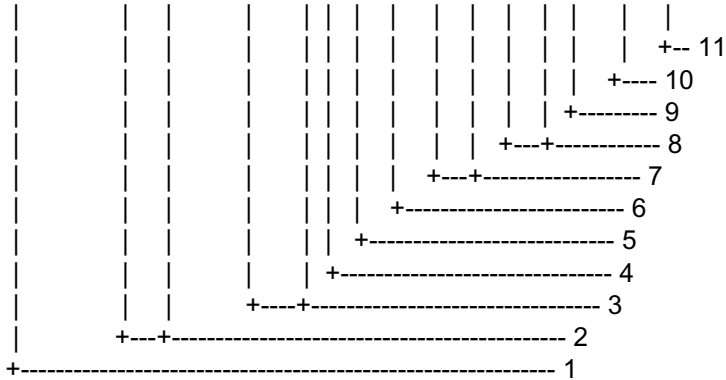
\$--DBT,x.x,f,x.x,M,x.x,F\*hh<CR><LF>



1. Water depth, feet
2. Water depth, m
3. Water depth, fathoms
4. Checksum

**GGA – Global positioning system (GPS) fix data**

\$--GGA,hhmmss.ss,llll.lll,a,yyyyy.yyy,a,x,xx,x.x,x.x,M,x.x,M,x.x,xxxx\*hh<CR><LF>



1. UTC of position
2. Latitude, N/S
3. Longitude, E/W
4. GPS quality indicator (see note)
5. Number of satellite in use, 00-12, may be different from the number in view
6. Horizontal dilution of precision
7. Antenna altitude above/below mean sealevel, m
8. Geoidal separation, m
9. Age of differential GPS data
10. Differential reference station ID, 0000-1023
11. Checksum

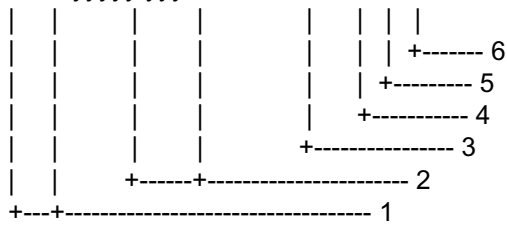
**NOTE**

- 0 = fix not available or invalid
- 1 = GPS SPS mode, fix valid
- 2 = differential GPS, SPS mode, fix valid
- 3 = GPS PPS mode, fix valid
- 4 = Real Time Kinetic. Satellite system used in RTK mode with fixed integers
- 5 = Float RTK. Satellite system used in RTK mode with floating fingers
- 6 = Estimated (dead reckoning) mode
- 7 = Manual input mode
- 8 = Simulator mode

The GPS quality indicator shall not be a null field.

**GLL – Geographic position, latitude and longitude**

\$--GLL,IIII.III,a,yyyyy.yyy,a,hhmmss.ss,A,a\*hh<CR><LF>



1. Latitude, N/S
2. Longitude, E/W
3. UTC of position
4. Status: A=data valid, V=data invalid
5. Mode indicator(see note)
6. Checksum

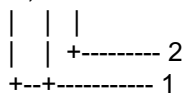
NOTE Positioning system Mode indicator:

- A = Autonomous
- D = Differential
- E = Estimated (dead reckoning)
- M = Manual input
- S = Simulator
- N = Data not valid

The Mode indicator field supplements the Status field. The Status field shall be set to V=invalid for all values of Operating Mode except for A=Autonomous and D=Differential. The positioning system Mode indicator and Status field shall not be null fields.

**MTW – Water temperature**

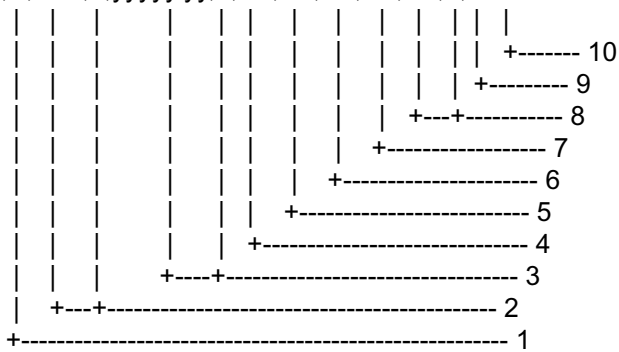
\$--MTW,x.x,C\*hh<CR><LF>



1. Temperature, degrees C
2. Checksum

**RMA – Recommended minimum specific LORAN-C data**

\$--RMA,A,llll.lll,a,yyyyy.yy,a,x.x,x.x,x.x,x.x,x.x,a,a\*hh<CR><LF>



1. Status: A=data valid, V=blink, cycle or SNR warning
2. Latitude, degrees N/S
3. Longitude, degrees E/W
4. Time difference A, microseconds
5. Time difference B, microseconds
6. Speed over ground, knots
7. Course over ground, degrees true
8. Magnetic variation(see note 1),degree E/W
9. Mode indicator(see note 2)
10. Checksum

NOTE 1 - Easterly variation(E) subtracts from true course  
 Westerly variation(W) adds to true course

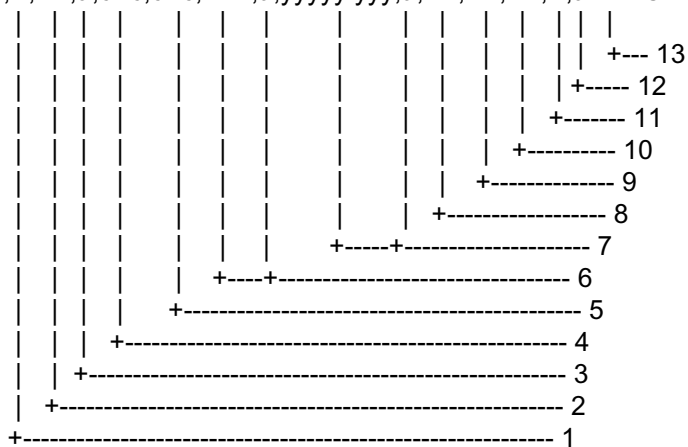
NOTE 2 Positioning system Mode indicator:

- A = Autonomous
- D = Differential
- E = Estimated (dead reckoning)
- M = Manual input
- S = Simulator
- N = Data not valid

The Mode indicator field supplements the Status field. The Status field shall be set to V=invalid for all values of Operating Mode except for A=Autonomous and D=Differential. The positioning system Mode indicator and Status field shall not be null fields.

**RMB – Recommended minimum navigation information**

```
$--RMB,A,x.x,a,c--c,c--c,III.III,a,yyyyy.yyy,a,x.x,x.x,x.x,A,a*hh<CR><LF>
```



1. Data status: A=data valid, V=navigation receiver warning
2. Cross track error(see note 2) n.miles
3. Direction to steer L/R
4. Origin waypoint ID
5. Destination waypoint ID
6. Destination waypoint latitude,N/S
7. Destination waypoint longitude,E/W
8. Range to destination, n.miles(see note 1)
9. Bearing to destination, degrees true
10. Destination closing velocity, knots
11. Arrival status: A=arrival circle entered or perpendicular passed
12. Mode indicator(see note 3)
13. Checksum

**NOTES**

- 1 If range to destination exceeds 999.9 nautical miles, display 999.9.
- 2 If cross track error exceeds 9.99 nautical miles, display 9.99.

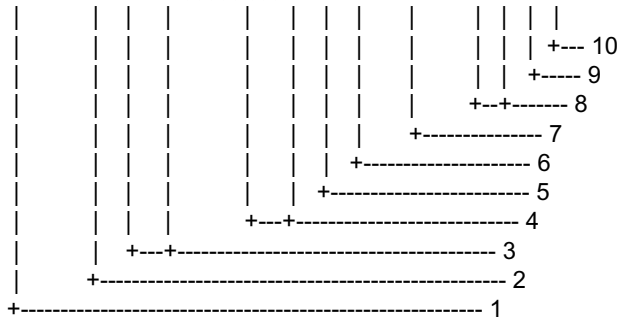
**3 Positioning system Mode indicator:**

- A = Autonomous
- D = Differential
- E = Estimated (dead reckoning)
- M = Manual input
- S = Simulator
- N= Data not valid

The Mode indicator field supplements the Status field. The Status field shall be set to V=invalid for all values of Operating Mode except for A=Autonomous and D=Differential. The positioning system Mode indicator and Status field shall not be null fields.

**RMC – Recommended minimum specific GPS/TRANSIT data**

\$--RMC,hhmmss.ss,A,lll.lll,a,yyyyy.yyy,a,x.x,x.x,xxxxx,x.x,a,a\*hh<CR><LF>



1. UTC of position fix
2. Status: A=data valid, V=navigation receiver warning
3. Latitude, N/S
4. Longitude, E/W
5. Speed over ground, knots
6. Course over ground, degrees true
7. Date: dd/mm/yy
8. magnetic variation, degrees E/W
9. Mode indicator(see note)
10. Checksum

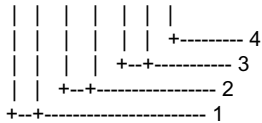
NOTE Positioning system Mode indicator:

- A = Autonomous
- D = Differential
- E = Estimated (dead reckoning)
- M = Manual input
- S = Simulator
- N = Data not valid

The Mode indicator field supplements the Status field. The Status field shall be set to V=invalid for all values of Operating Mode except for A=Autonomous and D=Differential. The positioning system Mode indicator and Status field shall not be null fields.

**VDR – Set and drift**

\$--VDR,x.x,T,x.x,M,x.x,N\*hh<CR><LF>

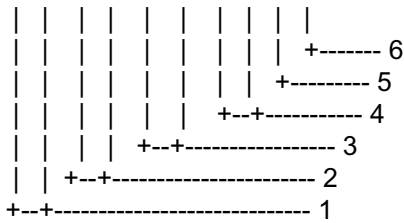


1. Direction, degrees true
2. Direction, degrees magnetic
3. Current speed, knots
4. Checksum



**VTG – Course over ground and ground speed**

\$--VTG,x.x,T,x.x,M,x.x,N,x.x,K,a\*hh<CR><LF>



1. Course over ground, degrees true
2. Course over ground, degrees magnetic
3. Speed over ground, knots
4. Speed over ground, km/h
5. Mode indicator(see note)
6. Checksum

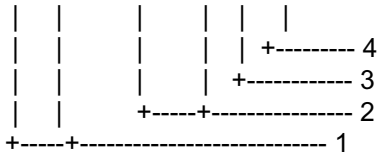
NOTE Positioning system Mode indicator:

- A = Autonomous
- D = Differential
- E = Estimated (dead reckoning)
- M = Manual input
- S = Simulator
- N = Data not valid

The positioning system Mode indicator field shall not be a null field.

**WPL – Waypoint location**

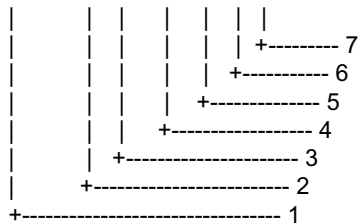
\$--WPL,lll.lll,a,yyyyy.yyy,a,c\*c\*hh<CR><LF>



1. Waypoint latitude, N/S
2. Waypoint longitude, E/W
3. Waypoint identifier
4. Checksum

**ZDA**

\$--ZDA,hhmmss.ss,xx,xx,xxxx,xx,xx\*hh<CR><LF>



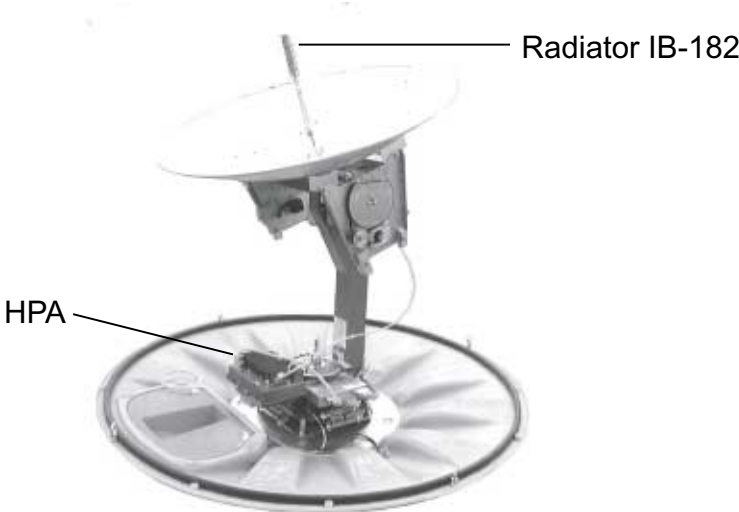
1. UTC
2. Day, 01 to 31(UTC)
3. Month, 01 to 12(UTC)
4. Year(UTC)
5. Local zone hours, 00h to +-13h
6. Local zone minutes, 00 to +59 as local hours
7. Checksum

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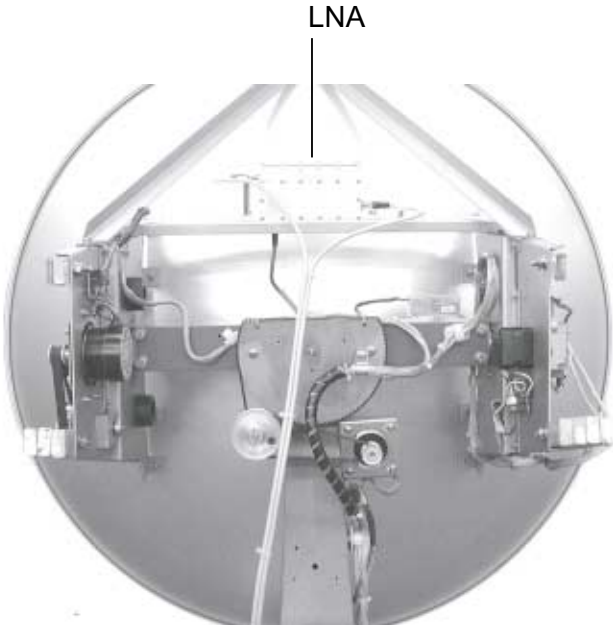
# APPENDIX F Parts Location, Parts List

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## Antenna Unit IB-182

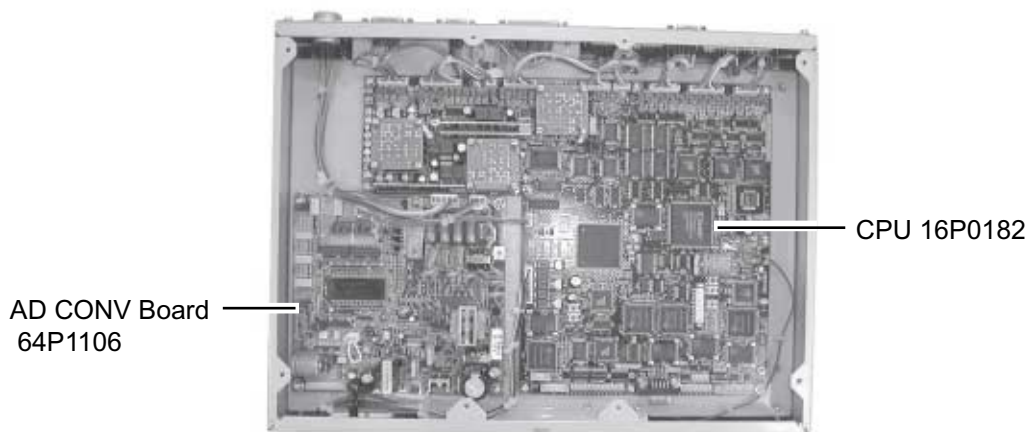


*Antenna unit, radome removed*

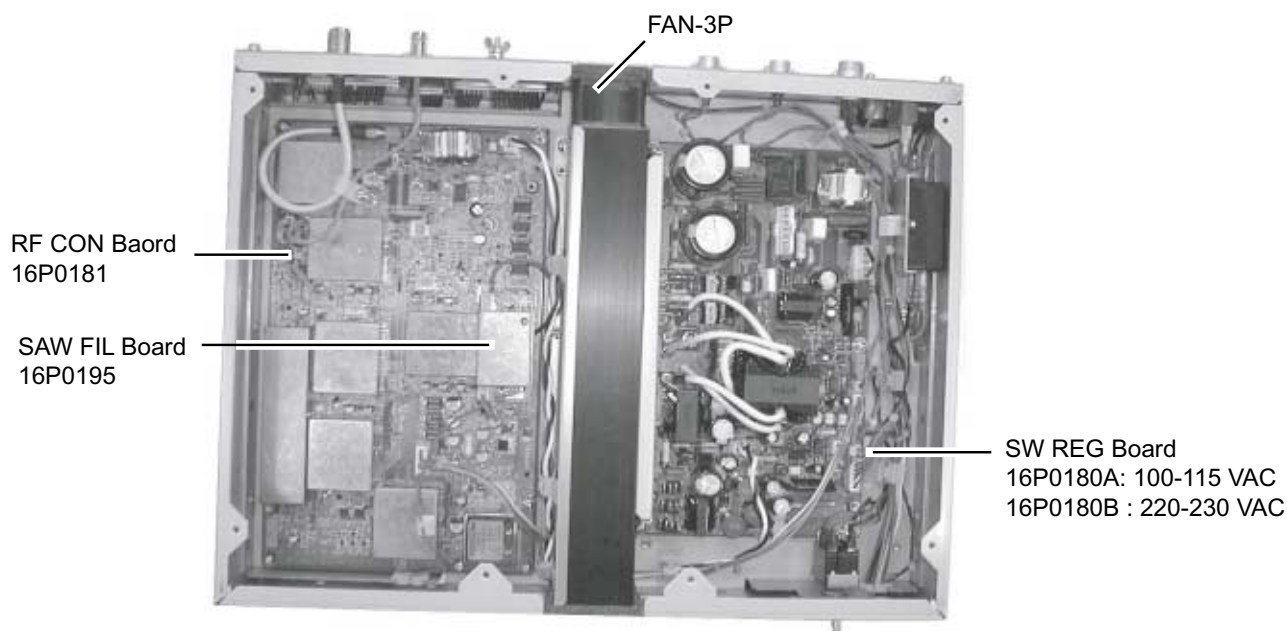


*Antenna unit, radiator*

# Communication Unit IB-282

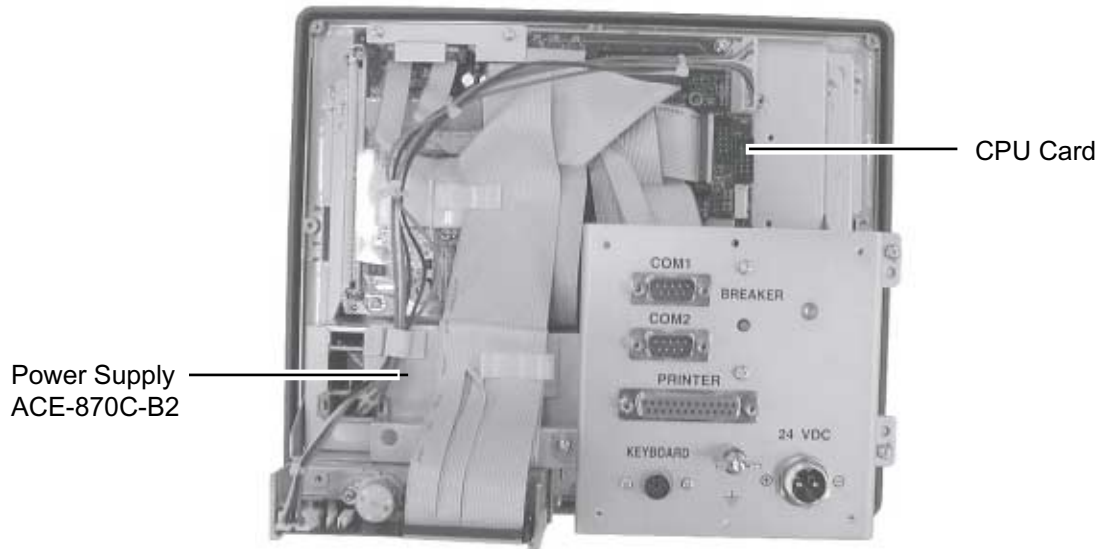


*Communication unit, top view, cover removed*

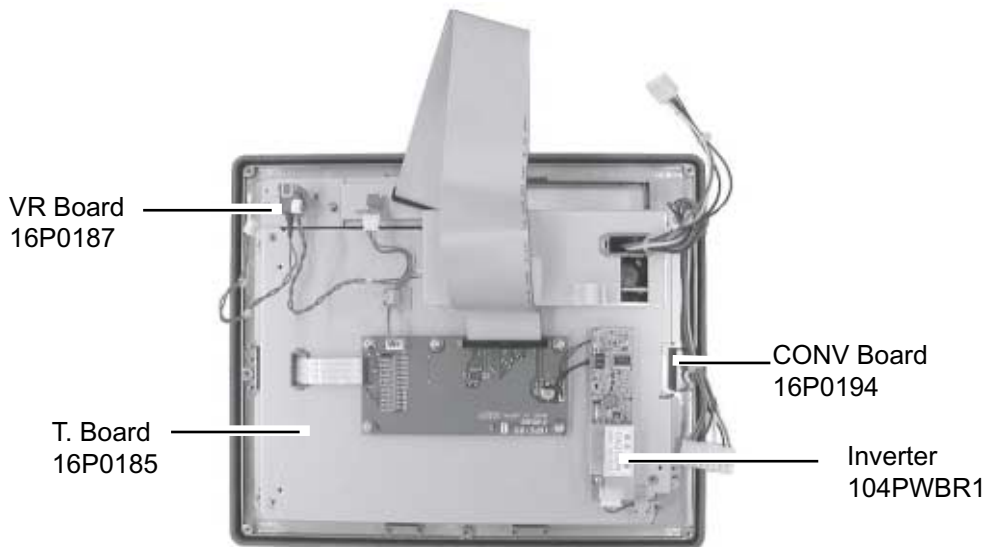


*Communication unit, bottom view, cover removed*

# Terminal Unit IB-582

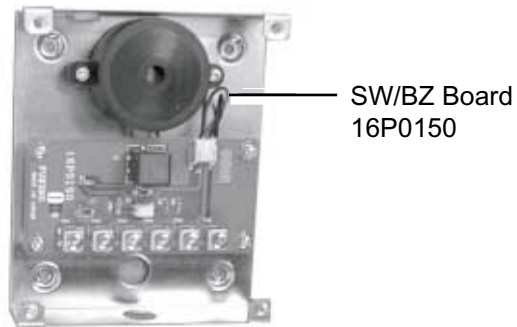


*Terminal unit, rear view, cover removed*



*Terminal unit, rear view, FIL Board removed*

## Telex Distress Alert Button IB-352, Telephone Distress Button IB-362, Incoming Indicator IB-372



*SW/BZ board (common to all above-mentioned units) for IB-352, IB-362, IB-372*

# FURUNO

## 電気部品表

### ELECTRICAL PARTS LIST

2000年 12月

Model	FELCOM 82A/82B	
Unit	インマルサット-B船舶地球局 INMARSAT-B MES	
Ref.Dwg.		Page
Blk.No.		

SYMBOL	TYPE	CODE No.	REMARKS	SHIPPABLE
回路記号	型式	コード番号	備考	ASSEMBLY 出荷単位組品
<b>IB-182</b>				
1B1	IB-182, RADIATOR	004-445-220		X
1B3	LNA	004-445-230	16P0178	X
1B5	HPA	004-445-240	16P0179	X
				X
<b>IB-282</b>				
2B1	SWREG, 16P0180A	004-445-290	100-115 VAC	X
	SWREG, 16P0180B	004-445-690	220-230 VAC	X
2B2	RFCON, 16P0181	004-445-300		X
2B3	CPU, 16P0182	004-445-310		X
2B4	AD100, 64P1106A	004-412-220	AD CONV	X
B1	16-150 (FAN-3P)	004-445-180	BL-PH Connector	X
<b>IB-582</b>				
3B2	16P0185, T.BOARD	004-445-390		X
3B3	16P0186, FIL	004-445-380		X
3B4	16P0187, VR	004-445-350		X
3B5	16P0194, CONV	004-445-360		X
	CPU CARD	004-445-410		X
	ACE-870C-B2	004-445-370	Power Supply	X
	104PWBR1	004-445-400	Inverter	X
<b>IB-352/362/372</b>				
	16P0150, SW/BZ	004-437-980		X

# SPECIFICATIONS OF THE INMARSAT -B SHIP EARTH STATION FELCOM 82 A/B (A: Class 1, B: Class 2)

## 1. ANTENNA UNIT

Antenna Type	0.9 m diameter parabola
Gain	Greater than 21.0dB
Axial Ratio	Less than 2dB
Antenna Beamwidth	15 deg. approx. (at -3dB)
Stabilization	Triple-axis active control type
Positioning	AZ: 360°, no-rewind EL: 5° to 90° (-27.5° to 122.5°)
Positioning Accuracy	AZ: Better than ±3 deg. EL: Better than ±3 deg.
Tracking	Step-tracking system

## 2. COMMUNICATION UNIT

Transmit Frequency	1626.5MHz to 1646.5MHz
Receiver Frequency	1525.0MHz to 1545.0MHz
Tuning Steps	10kHz (telex receiving), 20k (telex transmission, voice, 9.6 kbps data), 100 kHz (HSD)
G/T	Better than 4dB/K
EIRP	33/29/25 dBW
Modulation	
-Voice	24 kbps filtered O-QPSK
-9.6 kbps Data	24 kbps filtered O-QPSK
-HSD	132 kbps filtered O-QPSK
-Telex TX (Class 1)	24 kbps filtered O-QPSK
-Telex RX (Class 1)	6 kbps filtered BPSK
-TDM	6 kbps filtered BPSK
Coding	
-Voice	Convolution; Rate 3/4, K=7 (punctured)
-9.6 kbps Data	Convolution; Rate 1/2, K=7
-Telex	Convolution; Rate 1/2, K=7
Decoding	8-level soft - decision Viterbi
Voice Coding Method	16 kbps APC-MLQ
Interface	IEC61162-1 Ed.2 (NMEA3.0)
Input:	GGA, GLL, RMA, RMC, ZDA, VTG, RMB, WPL, MTW, DBT, VDR, BWC, BWR
Output:	GGA, ZDA, GLL, VTG, RMC, GSV



### 3. TERMINAL UNIT

Display	10.4" Color TFT LCD
Microprocessor	AL16117 (Intel 80386SX), 40MHz
Memory	RAM: 2MB, Video RAM: 1MB, Disk on chip: 8MB or more
Disk Drive	720kB or 1.44MB 3.5" FDD
Serial Port	2 ports of RS-232C
Parallel Port	1 port of Centronics
Keyboard	Enhanced 82-key keyboard emulates the IBM PS/2 keyboard and includes embedded numeric and cursor control overlay and dedicated cursor control keys.

### 4. PRINTER

Printing System	Serial impact dot matrix
Character Composition	9 x 7 dot matrix
Printing Speed	Draft: 200 characters/second, NLQ: 50 characters/second
Emulation	Epson FX850 mode or IBM Proprinter II mode
Type of Characters	324 letters (Epson FX850 mode) 262 letters (IBM Proprinter II mode)
Type of Paper	Roll paper, type " 1P", non carbon paper 34g/m <sup>2</sup>
Paper Advance Speed	1/6, 1/8 or 1/216 inch steps, 8.3 lines/sec(at 1/6" step)
Data Buffer	21K bytes (Epson FX 850 mode) 9.3K bytes (IBM Proprinter II mode)
Number of Copies	Original plus 2 copies (Total thickness: 0.2mm or less)
Ribbon	Original fabric ribbon (13mm x 14m)
Interface	Parallel interface (Centronics)
Noise	Less than 59 dBA

### 5. INTERFACE

DGPS:	Frequency: 1525 to 1545 Hz, Level: -100 to -60 dBm
HSD:	RS-422/RS-449, 56000/64000 bps (sync)
GYRO:	Gyro-repeater signal (sync/step)
NAVAID:	IEC 61162 (NMEA0183), 4800 bps
Phones:	2-line modular cable

### 6. POWER SUPPLY

Communication unit/ Antenna unit/ Terminal unit/ Printer	100-115/220-230 VAC: 4.1/1.9 A (transmission), 2.2/1.1 A (receiving), 1 phase, 50/60 Hz
Terminal Unit	24 VDC: 1.0 A
Printer (PP-510)	24 VDC: 1.5 A

## 7. ENVIRONMENTAL CONDITION

### Category of Equipment

Antenna Unit: To be installed in a Exposed area

Others: To be installed in a Protected area

Ambient Temperature IEC 60945 3rd Inmarsat-B SDM

Antenna unit: -25°C to +55°C -25°C to +50°C

Communication unit: -15°C to +55°C 0°C to +45°C

Terminal unit: -15°C to +55°C 0°C to +45°C

Printer (Facsimile): +5°C to +35°C 0°C to +45°C

Relative Humidity IEC 60945 93% at 40°C (Inmarsat B SDM 95%)

Waterproofing IEC 60529;

Antenna Unit: IPx6

Communication Unit/Terminal Unit: IPx0

Handset w/bracket: IPx2

Printer: IPx0

Vibration IEC 60945 (Inmarsat B SDM)

Motion Roll:  $\pm 30^\circ/8s$ , Pitch:  $\pm 10^\circ/6s$ , Yaw:  $\pm 8^\circ/50s$ , Surge:  $\pm 0.2G$ ,

Sway:  $\pm 0.2G$ , Heave:  $\pm 0.5G$ , Rotation:  $6^\circ/s$ , Speed: 30 kt

## 8. COATING COLOR

Antenna Unit Munsell N9.5

Communication Unit Panel: N3.0, Cover: 2.5GY5/1.5

Terminal Unit Panel: N3.0, Cover: 2.5GY5/1.5

Handset/ Handset bracket N3.0

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---

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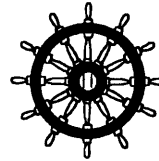
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**Declaration of conformity****0560**We **FURUNO ELECTRIC CO., LTD.**

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hereby declare under our sole responsibility that the product

Inmarsat-B satellite earth station models FELCOM 82A (Class 1) and FELCOM 82B (Class 2) consisting of Communication unit IB-282, Terminal unit IB-582, Antenna unit IB-182, Printer PP-510, Telephone PC622SL1, Junction box IB-313, Telex distress button IB-352, Telephone distress button IB-362, Receiver call unit IB-372, Handset IB-882

(Model names, type numbers)

to which this declaration relates conforms to the following standard(s) or normative document(s)

IMO Resolution MSC.36(63): 01.01.96 – International Code of Safety of High-Speed Craft (HSC Code)  
 IMO Resolution A.694(17): 06.11.91 – General requirements for shipborne radio equipment forming part of the GMDSS and for electronic navigational aids  
 IMO Resolution A.570(14): 20.11.85 – Type approval of ship earth stations  
 IMO Resolution A.808(19): 23.11.95 – Performance standards for ship earth stations capable of two-way communications  
 MSC/Circ.862: 01.02.99 – Clarification of certain requirements in IMO performance standards for GMDSS equipment  
 IEC 61097-10: June 1999, Edition 1  
 EN 60945: 1997-01 (IEC 60945 Third edition: 1996-11)  
 IEC 61162-1: 2000-07

(title and/or number and date of issue of the standard(s) or other normative document(s))

For assessment, see

- EC type-examination certificate N°: 01212001/AA/01 of 7 May 2002 issued by Telefication, The Netherlands
- Test report TI-1726 of 21 November 2000 prepared by Furuno Electric Co., Ltd.
- Test report FLI 12-00-032 of 25 December 2000 prepared by Furuno Labotech International Co., Ltd.

This declaration is issued according to the provisions of European Council Directive 96/98/EC on marine equipment modified by Commission Directive 2001/53/EC.

On behalf of Furuno Electric Co., Ltd.

Hiroaki Komatsu  
 Manager,  
 International Rules and Regulations

Nishinomiya City, Japan  
 June 17, 2002

(Place and date of issue)

(name and signature or equivalent marking of authorized person)