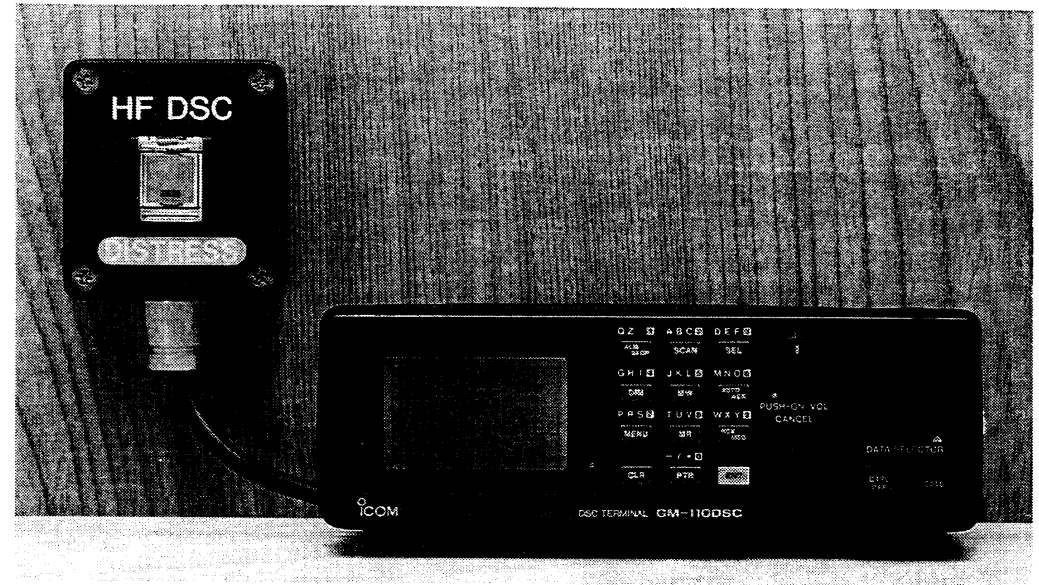


ICOM

INSTRUCTION MANUAL

DSC TERMINAL UNIT **GM-110DSC**



Icom Inc.

IMPORTANT

READ ALL INSTRUCTIONS carefully and completely before using the GM-110DSC.

SAVE THIS INSTRUCTION MANUAL – This instruction manual contains important safety and operating instructions for the GM-110DSC.

YOU MUST CONNECT the GM-110DSC to the IC-M710 MF/HF MARINE TRANSCEIVER, GMDSS version, to operate this DSC terminal unit.

EXPLICIT DEFINITIONS

The following explicit definitions apply to this instruction manual.

WORD	DEFINITION
WARNING	Personal injury, fire hazard or electric shock may occur.
CAUTION	Equipment damage may occur.
NOTE	If disregarded, inconvenience only. No risk of personal injury, fire or electric shock.

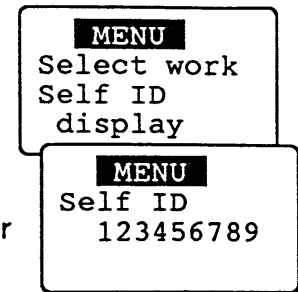
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AT FIRST POWER ON

◆ Self ID indication

The GM-110DSC does not function when no ID is programmed. Therefore, the ID code should be checked at first power ON.

- ① Push [⑦ MENU] to select MENU mode.
- ② Rotate [DATA SELECTOR] to select “Self ID” display, then push [ENT].
 - If no ID appears, ask a Service Center to program your permitted ID code.



◆ Self testing

The GM-110DSC has a self testing capability for the AFSK encoder and decoder. Use the function to check the unit without transmitting a DSC call.

- ① Push [⑦ MENU] to select MENU mode.
- ② Rotate [DATA SELECTOR] to select “Self test” display, then push [ENT].
 - If “Self test OK” does not appear, contact a Service Center.

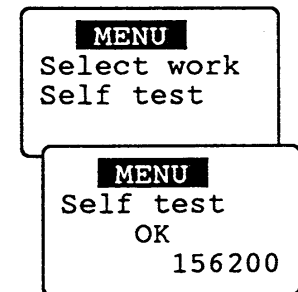


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CAUTIONS

⚠ WARNING! NEVER connect the terminal unit (and a DC-DC unit for European version) to an AC outlet. This may pose a fire hazard or result in an electric shock.

⚠ WARNING! NEVER transmit a distress call when your vessel does not need immediate help. Distress calls can be used only in times of emergency.

NEVER connect the terminal unit (and a DC-DC unit for Europe version) to a 24 V battery. This connection will ruin the transceiver.

Europe version only! NEVER connect the GM-110DSC to the battery of a plus-grounding ship directly. The supplied DC-DC unit must be used between the GM-110DSC and the battery. Otherwise fuses might blow and the terminal unit cannot be used.

NEVER cut the DC cable between the DC plug and fuse holder. If an incorrect connection is made after cutting, the terminal unit might be damaged.

NEVER allow children to touch the terminal unit.

NEVER place the terminal unit where normal operation of the ship may be hindered or where it could cause bodily injury.

NEVER expose the terminal unit to rain, snow or any liquids.

KEEP the terminal unit and external speaker at least 1 meter away from your vessel's magnetic navigation compass.

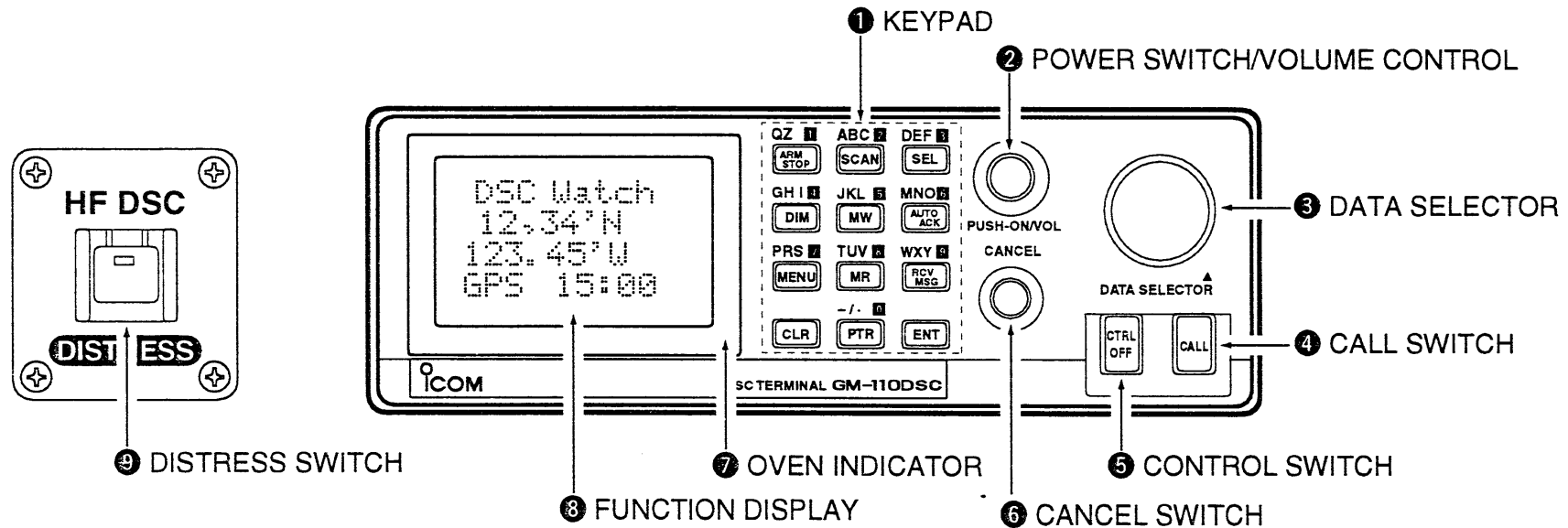
DO NOT use chemical agents such as benzene or alcohol when cleaning, as they can damage the terminal unit surfaces.

AVOID using or placing the transceiver in direct sunlight or in areas with temperatures below -20°C (-4°F) or over $+60^{\circ}\text{C}$ ($+140^{\circ}\text{F}$).

AVOID connecting the terminal unit to a power source using reverse polarity. This connection will not only blow fuses but may also damage the terminal unit.

PANEL DESCRIPTION

1



1 KEYPAD

- Input the corresponding number or letters when required.
- Other functions are as follows:



- Stops emergency alarm (distress use) or repeating beeps (general call use).
- Used for “space” input when deleting a character during letter input.



- Starts scan of the pre-programmed frequencies on the connected transceiver (p. 24).



- Enters SEL mode. SEL mode allows you to select the format specifier of the scan key.



- Push to turn the dimmer adjusting mode ON/OFF.
- Adjusts the display backlight via the [DATA SELECTOR].

- Received signals are decoded in the GM-110DSC.
- Scanning frequencies can be programmed in up to 6 channels using MENU mode.
- 6 distress frequencies are always scanned in the GM-110DSC regardless of scan key activation.

1 PANEL DESCRIPTION

- JKL 5** Enters Memory Writing mode (*p. 41*).
MW
- The selected DSC format and contents are programmed into a memory channel.
 - Push this key, then push a digit key (memory channel number, 1 – 9) to program.
 - Previously programmed memory contents are overwritten.

- MNO 6** Turns an auto 'acknowledgement' ON and OFF, and sets its contents (*p. 42*).
AUTO ACK
- The auto 'acknowledgment' can be turned ON during the "DSC Watch" condition only.
 - Automatic acknowledgement does not function for a distress call.

- PRS 7** Enters MENU mode to prepare often-used ID codes, call/traffic frequencies, scan frequencies, etc (*p. 36*).
MENU

- TUV 8** Enters Memory Read mode to call up the pre-programmed DSC format and its contents (*p. 41*).
MR
- Push this key, then push a digit key (memory channel number, 1 – 9) to call up.

- WXY 9** Enters RCV MSG (Receive Message) mode to call up the received DSC format and its contents (*p.26*).
RCV MSG
- Up to 20 distress calls (incl. other calls in the distress category) are retained.
 - Up to 10 selective calls are retained until the terminal unit is turned OFF.

- CLR**
- Clears input data or exits the selected mode.
 - Pushing this key does not exit the mode for some numeral/letter input items. In such cases, [CTRL OFF] can be used to exit.
 - Clears an "acknowledge waiting" display.
 - Cancels repeated transmission while waiting for a distress acknowledgement (*p. 7*).

- /• 8** Prints out the received message when a printer is connected.
PTR
- The automatic printout function is available to printout the received information each time a DSC call is received (*p. 39*).
 - Programmed memory, frequency, etc. can also be printed out when selecting its display (*p. 37*).

- ENT**
- Enters the selected format and advances the item to indicate the contents.
 - Selects the traffic frequency when a DSC call is received.

② POWER SWITCH/VOLUME CONTROL

- Turns power ON and OFF when the control is pushed.
- Adjust the alarm and beep output level from the speaker.
 - These audio outputs cannot be completely muted even when the control is set fully counterclockwise.

③ DATA SELECTOR


- Selects contents in the selected item.
- Selects a cursor position during frequency or ID input.

④ CALL SWITCH

- Push and hold the switch for 5 sec. to transmit the selected call.
- Push the switch to set the transceiver to the pre-selected DSC's call frequency (or channel) which is selected in SEL mode for detecting stand-by.

⑤ CONTROL OFF SWITCH

Deactivates the transceiver control and returns the transceiver's frequency (or channel) to the previous one.

 **CAUTION: NEVER** push this switch while "acknowledge waiting" appears. This is because this returns the transceiver to the previous frequency and therefore, an 'acknowledgement' cannot be received.

⑥ CANCEL SWITCH

Push this switch to cancel a distress call.


⑦ OVEN INDICATOR

Internal high-stability crystal oscillator unit contains a temperature-compensating oven heater. This high-stability crystal oscillator improves frequency stability.

⑧ FUNCTION DISPLAY

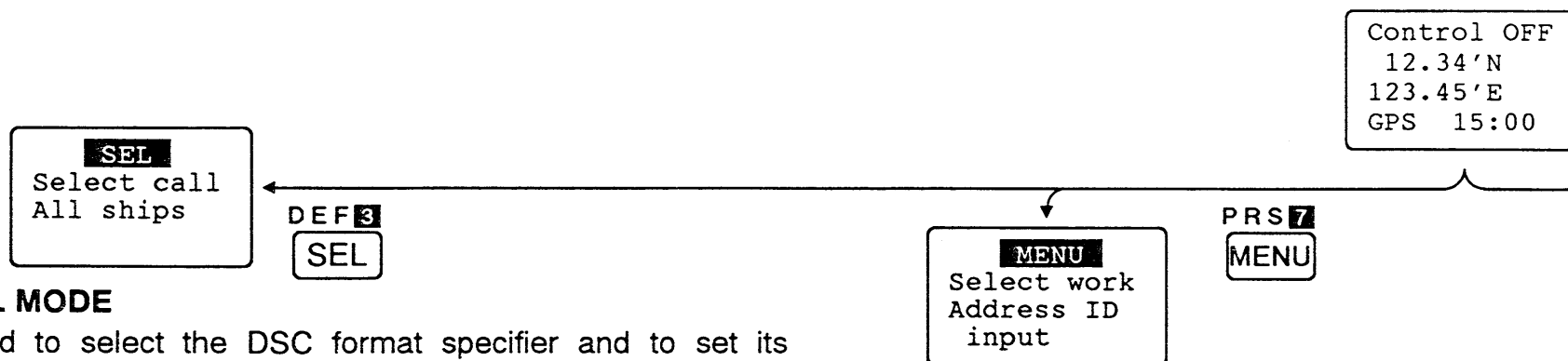
During normal operation the display shows position and UTC time when a GPS receiver is connected. This is updated each time new GPS data is received.

If no GPS receiver is connected, the position and UTC time must be set in advance.

 **NOTE:** If GPS data is interrupted for 30 sec. the "GPS" indication disappears. The terminal unit retains the most recent data in such cases.

⑨ DISTRESS CALL SWITCH

Push and hold for 5 sec. to make a distress call.
(See p. 6)

**SEL MODE**

Used to select the DSC format specifier and to set its contents.

AVAILABLE DSC FORMATS:

- Distress call (pgs. 6, 44)
- Distress acknowledgement (pgs. 30, 44)
- Distress relay call (pgs. 29, 45)
- Distress relay acknowledgement (p. 45)
- All ships call (pgs. 8–13, 46)
- Geographical area call (pgs. 8–15, 46)
- Group call (pgs. 8–15, 47)
- Individual call (pgs. 8–15, 48)
- Individual acknowledgement (pgs. 34, 48)
- Position request call
- Position request acknowledgement (p. 49)
- Polling call (pgs. 24, 50)
- Polling acknowledgement (pgs. 35, 50)
- Telephone call (pgs. 16, 52)
- Medical transport call (pgs. 18, 52)
- Test call (pgs. 21, 52)

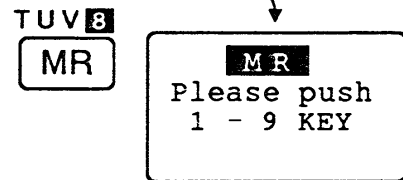
MENU MODE

Used for pre-programming ID code, frequencies, etc. for convenient SEL mode settings.

In addition, time setting and self-testing for code encode/decode are available in this mode.

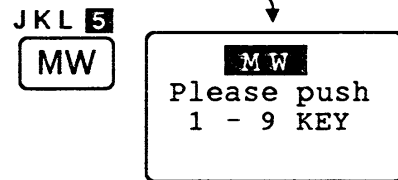
AVAILABLE PRE-PROGRAMMABLE CONTENTS:

- Address ID input / delete (p. 37/39)
- Group ID input / delete (p. 37/39)
- Scan frequency input / delete (p. 38/39)
- Call frequency input / delete (p. 38/39)
- Traffic frequency input / delete (p. 38/39)
- Position/time set (p. 36)
- Automatic printout ON/OFF (p. 39)
- Self-testing (p. 40)
- Self-ID indication (p. 40)



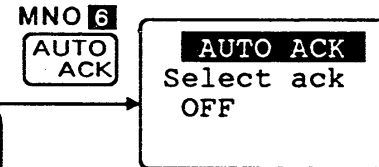
MEMORY READ MODE
 The selected DSC format specifier and contents can be programmed into one of 9 memory channels for quick selection (p. 41).
 The programmed format specifier appears for 0.5 sec. when reading the memory.

OPERATION:
 Push [8 MR], then push the desired numeral key.



MEMORY WRITE MODE
 The set contents and format specifier can be programmed into one of 9 memory channels (p. 41).

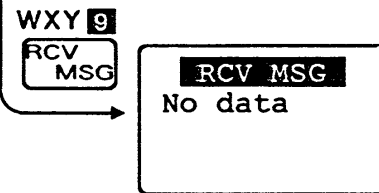
OPERATION:
 ① Select the desired DSC format using SEL mode.
 ② Set contents according to the format.
 ③ After exiting SEL mode, push [5 MW], then push the desired numeral key.



AUTO ACK MODE
 Sets 'automatic acknowledgement' transmission to enable or OFF.
 The following reasons are available for an 'acknowledgement':

- No reason given
- Busy
- Operator unavailable
- Equipment disable
- CH unable to use
- Mode unable to use

NOTE: Auto acknowledgement can be set only when the 'DSC Watch' is selected.



RCV MSG MODE
 Shows received call; acknowledgement, etc.

The following number of message channels are available:

- Distress : up to 20
- Other DSCs : up to 10

NOTE: The following formats cannot be memorized:
 Distress, Distress relay, test, and all acknowledgements.

3

CALL PROCEDURE

Distress call

A distress call should be transmitted if, in the opinion of the Master, the ship or a person is in distress and requires immediate assistance.

A distress call should include the ship's position and time. They are included automatically when a GPS receiver is connected. If no GPS is connected, input them, if possible.

NEVER USE THE DISTRESS CALL WHEN YOUR SHIP IS NOT IN AN EMERGENCY. DISTRESS CALLS CAN BE USED ONLY WHEN IMMEDIATE HELP IS NEEDED.

- ① Confirm a distress call is not being received.
- ② Lift up the switch cover, push and hold the [DISTRESS] switch to transmit the distress call.
 - An emergency frequency (default: 2187.5 kHz) is automatically selected and the distress call is transmitted.
 - If you have the time, select the nature of the distress and contents (p. 44).
 - If no GPS is connected, your location and UTC time should be input.

- ③ After transmitting the call, the transceiver is set to the phone emergency frequency automatically (e.g. 2182.0 kHz).

- The terminal unit is still waiting for an acknowledgement call on the previous frequency (e.g. 2187.5 kHz).

Distress
acknowledge
waiting

- ④ When receiving the 'acknowledgement', reply to the connected station via the transceiver's microphone as described on page at right.

- The 'acknowledgement' is memorized into the RCV MSG channel.

Distress ack
receive
001234567


ID code of the
coast station.


- ⑤ Activate an EPIRB and prepare a SART and VHF handheld transceiver before launching a survival craft.

◇ When no acknowledgement is received

If no 'acknowledgement' is received, the emergency alarm will sound continuously. In this case, the terminal unit automatically transmits the distress call again every 3 to 4 minutes.

- Push [CANCEL] if you want to stop the alarm.
- A distress relay call may be received after several minutes from another ship if 'acknowledgement' cannot be received from a coast station directly.

 **CAUTION: DO NOT** push [CLR] while waiting for an 'acknowledgement', otherwise the distress call repeat is canceled.

 Use the [CLR] key only when you want to cancel repeated transmission.

◇ After receiving an acknowledgement call

The following should commence your voice transmission after receiving a 'distress acknowledgment' from a coast station (or another ship).

- "MAYDAY"
- "This is (your ship name)".
- The 9-digit identity **AND** the call sign (or other identification of the ship).
- The ship's position if the DSC distress does not include it.
- The nature of the distress and assistance required.
- Any other information which might facilitate the rescue.

3 CALL PROCEDURE

■ Distress call to ships

General DSC call with the 'distress' category may be used for communications after the Distress call, e.g. you want to change the operating mode, frequency, etc.

The call is transmitted one time only although the distress call using the [DISTRESS] key sends 5 times repeatedly.

- ① Push [SEL] to select SEL mode.
- ② Rotate the [DATA SELECTOR] to select the desired DSC format as described below, then push [ENT]:

SEL
Select call
All ships

To all ships

SEL
Select call
Geographical
area

To all ships in the
specified area
(Refer to p. 23 for
area input.)

SEL
Select call
Group

To a group of ships
(Refer to p. 22 for
address ID input.)

SEL
Select call
Individual

To a specified ship
or coast station

- When selecting 'All ships', 'Geographical area' or 'Group' call

- ③ Rotate the [DATA SELECTOR] to select the 'Distress' as the category, then push [ENT].
- ④ Set all contents as displayed using the [DATA SELECTOR] and [ENT] key.
- ⑤ After the display at right appears, push [CALL] momentarily to select the call frequency, then confirm the frequency is not in use.
- ⑥ Push and hold [CALL] for 5 sec. to transmit the distress call.
 - The transceiver is set to the traffic frequency after call transmission.

All ships
Category
Distress

All ships
call ready
Push 5sec
CALL

All ships
calling

• When selecting 'Individual' call

- ③ Select (or enter) the 9-digit ID code, then, push [ENT].
 - Use [DATA SELECTOR] to select the ID code when the desired ship's ID is pre-programmed.
 - Use digit keys to enter 9 digits for a non-programmed ID. Refer to p. 22 for more information
- ④ Set 'Distress' as the category using the [DATA SELECTOR], then push [ENT]
- ⑤ Set all contents as displayed using the [DATA SELECTOR] and [ENT] key.
- ⑥ After the display at right appears, push [CALL] momentarily to select the call frequency, then confirm the frequency is not in use.

```
Individual
Address ID
123456789
ICOM DSC
```

```
Individual
Category
Distress
```

```
Individual
call ready
push 5sec
CALL
```

- ⑦ Push and hold [CALL] for 5 sec. to transmit the distress call.
 - After sending the call, the unit waits for an 'acknowledgement'.
- ⑧ When receiving an 'Individual acknowledgement', the display shows the received ID code.
 - The transceiver is set to the traffic frequency automatically.
- ⑨ Communicate with the station.

```
Individual
acknowledge
waiting
```

```
Ind ack
receive
123456789
ICOM DSC
```

↑
Station's ID code
(Name appears when the same code is programmed in MENU mode.)

3 CALL PROCEDURE

■ Urgency call

When you want send an urgency message to other ships, use 'Urgency' as the category.

- ① Push [③ SEL] to select SEL mode.
- ② Rotate the [DATA SELECTOR] to select the desired DSC format as described below, then push [ENT]:

SEL
Select call
All ships

To all ships

SEL
Select call
Geographical
area

To all ships in the
specified area
(Refer to p. 23 for
area input.)

SEL
Select call
Group

To a group of ships
(Refer to p. 22 for
address input.)

SEL
Select call
Individual

To a specified ship
or coast station

- When selecting 'All ships', 'Geographical area' or 'Group' call

- ③ Rotate the [DATA SELECTOR] to select 'Urgency' as the category, then push [ENT].

All ships
Category
Urgency

- ④ Set all contents as displayed using the [DATA SELECTOR] and [ENT] key.

- ⑤ After the display at right appears, push [CALL] momentarily to select the call frequency, then confirm the frequency is not in use.

All ships
call ready
Push 5sec
CALL

- ⑥ Push and hold [CALL] for 5 sec. to transmit the urgency call.
 - The transceiver is set to the traffic frequency after call transmission.

All ships
calling

- ⑦ Announce the message described in the box on the page opposite.

• When selecting 'Individual' call

- ③ Select (or enter) the 9-digit ID code, then, push [ENT].
 - Use [DATA SELECTOR] to select the ID code when the desired ship's ID is pre-programmed.
 - Use digit keys to enter 9 digits for a non-programmed ID. Refer to p. 22 for more information.

```
Individual
Address ID
123456789
ICOM DSC
```

- ④ Set 'Urgency' as the category using the [DATA SELECTOR], then push [ENT].

```
Individual
Category
Urgency
```

- ⑤ Set all contents as displayed using the [DATA SELECTOR] and [ENT] key.

- ⑥ After the display at right appears, push [CALL] momentarily to select the call frequency, then confirm the frequency is not in use.

```
Individual
call ready
push 5sec
CALL
```

- ⑦ Push and hold [CALL] for 5 sec. to transmit the 'urgency' call.
 - After sending the call, the unit waits for an 'acknowledgement' as at right.

```
Individual
acknowledge
waiting
```

- ⑧ When receiving an 'acknowledgement', the display shows the received ID code.
 - The transceiver is set to the traffic frequency automatically.

```
Ind ack
receive
123456789
ICOM DSC
```

↑
Station's ID code
(Name appears when the same code is programmed in MENU mode.)

- ⑨ Announce the following message to the connected station.

- "PAN PAN" (repeated 3 times).
- Desired station name or "all stations" (repeated 3 times).
- "This is (your ship name)".
- The 9-digit identity **AND** the call sign (or other identification of the ship).
- The text of the urgency message.

3 CALL PROCEDURE

■ Safety call

When you want to send a 'safety' message to other ships, use 'Safety' as the category.

- ① Push [SEL] to select SEL mode.
- ② Rotate the [DATA SELECTOR] to select the desired DSC format as described below, then push [ENT]:

SEL
Select call
All ships

To all ships

SEL
Select call
Geographical
area

To all ships in the
specified area.
(Refer to p. 23 for
area input.)

SEL
Select call
Group

To a group of ships
(Refer to p. 22 for
address input.)

SEL
Select call
Individual

To the specified ship
or coast station

- When selecting 'All ships', 'Geographical area' or 'Group' call

- ③ Rotate the [DATA SELECTOR] to select 'Safety' as the category, then push [ENT].

All ships
Category
Safety

- ④ Set all contents as displayed using the [DATA SELECTOR] and [ENT] key.

- ⑤ After the display at right appears, push [CALL] momentarily to select the call frequency, then confirm the frequency is not in use.

All ships
call ready
Push 5sec
CALL

- ⑥ Push and hold [CALL] for 5 sec. to transmit the 'safety' call.
 - The transceiver is set to the traffic frequency after call transmission.

All ships
calling

- ⑦ Announce the message described in the box on the page opposite.

• **When selecting 'Individual' call**

- ③ Select (or enter) the 9-digit ID code, then, push [ENT].
 - Use [DATA SELECTOR] to select the ID code when the desired ship's ID is pre-programmed.
 - Use digit keys to enter 9 digits for a non-programmed ID. Refer to p. 22 for more information.
- ④ Set 'Safety' as the category using the [DATA SELECTOR], then push [ENT].
- ⑤ Set all contents as displayed using the [DATA SELECTOR] and [ENT] key.
- ⑥ After the display at right appears, push [CALL] momentarily to select the call frequency, then confirm the frequency is not in use.

```
Individual
Address ID
123456789
ICOM INC
```

```
Individual
Category
Safety
```

```
Individual
call ready
Push 5sec
CALL
```

- ⑦ Push and hold [CALL] for 5 sec. to transmit the 'safety' call.
 - After sending the call, the unit waits for an 'acknowledgement' as at right.
- ⑧ When receiving an 'acknowledgement', the display shows the received ID code.
 - The transceiver is set to the traffic frequency automatically.
- ⑨ Announce the following message to the connected station.

```
Individual
acknowledge
waiting
```

```
Ind ack
receive
123456789
ICOM DSC
```

↑
Station's ID code
(Name appears
when the same
code is programmed
in MENU mode.)

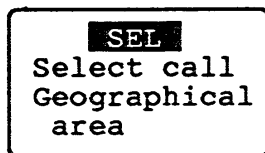
- "SECURITE" (repeated 3 times).
- Desired station name or "all station" (repeated 3 times).
- "This is (your ship name)".
- The 9-digit identity **AND** the call sign (or other identification of the ship).
- The text of the safety message.

3 CALL PROCEDURE

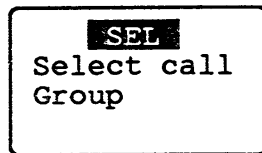
■ Routine or ship's business call

When you use DSC for general selective calling, use 'Routine' or 'Ships business' as the category.

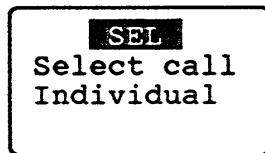
- ① Push [SEL] to select SEL mode.
- ② Rotate the [DATA SELECTOR] to select the desired DSC format as described below, then push [ENT]:
 - 'All ships' call cannot be used for the 'routine' or 'ships business' category.



To all ships in the specified area


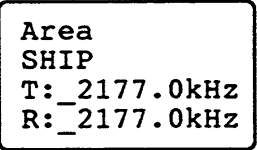


To group of ships (refer to p. 22 for address ID input)



To a specified ship or coast station

◇ When selecting 'Geographical area' or 'Group' call

- ③ Enter the desired area or group ID code via the keypad or [DATA SELECTOR], respectively, then push [ENT].
 - Refer to p. 22 or p. 23 for details.
- ④ Rotate the [DATA SELECTOR] to select 'Routine' or 'Ships business' as the category, then push [ENT].A rectangular box with a black border. The text "Area Category Routine" is displayed in a monospaced font.
- ⑤ Set all contents as displayed using the [DATA SELECTOR] and [ENT] key.
 - 2177 kHz should be used for the ship-to-ship call frequency.A rectangular box with a black border. The text "Area SHIP T: 2177.0kHz R: 2177.0kHz" is displayed in a monospaced font.
- ⑥ After "call ready" appears, push [CALL] momentarily to select the call frequency, then confirm the frequency is not in use.
- ⑦ Push and hold [CALL] for 5 sec. to transmit the call.
 - The transceiver is set to the traffic frequency after call transmission.
- ⑧ Announce the following message to stations.
 - "All stations" or group name.
 - "This is (your ship name)."
 - The 9-digit identity **OR** call sign (or other identification of the ship).

Area
Category
Routine

Area
SHIP
T: 2177.0kHz
R: 2177.0kHz

• **When selecting 'Individual' call**

- ③ Select (or enter) the 9-digit ID code, then, push [ENT].
- Use [DATA SELECTOR] to select the ID code when desired ship's ID (or coast station's ID) is pre-programmed.
 - Use digit keys to enter 9 digits for non-programmed ID. Refer to p. 22 for more information.

```

Individual
Address ID
123456789
ICOM DSC
    
```

- ④ Set 'Routine' or 'Ships business' in category using the [DATA SELECTOR], then push [ENT].

```

Individual
Category
Routine
    
```

- ⑤ Set all contents as displayed using the [DATA SELECTOR] and [ENT] key.
- 2177 kHz should be used for ship-to-ship call.
 - T: 2189.5/R: 2177 kHz should be used for ship-to-coast call.

```

Individual
INTER2-1
T: 2189.5kHz
R: 2177.0kHz
    
```

- ⑥ After the display at right appears, push [CALL] momentarily to select the call frequency, then confirm the frequency is not in use.

```

Individual
call ready
Push 5sec
CALL
    
```

- ⑦ Push and hold [CALL] for 5 sec. to transmit the DSC call.
- After sending the call, the unit waits for an 'acknowledgement' as at right.

```

Individual
acknowledge
waiting
    
```

- ⑧ When receiving an 'acknowledgement', the display shows the received ID code.
- The transceiver is set to the traffic frequency automatically.

```

Ind ack
receive
123456789
ICOM DSC
    
```

↑
Station's ID code
(name appears
when the same
code is programmed
in MENU mode)

- ⑨ Announce the following message to the station.
- The 9-digit identity (or call sign or other identification) of the station which you want to call.
 - "This is (your ship name)."
 - The 9-digit identity **OR** call sign (or other identification of the ship).

/// When no 'acknowledgement' is received:

- ① Wait for 5 min., then call again on the same or a different frequency.
- ② If no 'acknowledgement' is received after the 2nd call, wait for at least-15 min. before repeating the call.

3 CALL PROCEDURE

■ Telephone call

The frequency (or channel) and mode for telephone use are specified by a coast station, therefore, two call/acknowledgements are usually necessary before making a telephone call.

- ① Push [③SEL] to select SEL mode.
- ② Rotate [DATA SELECTOR] to select the telephone call, then push [ENT].

```
SEL
Select call
Telephone
```

- ③ Set the necessary contents as at right and below.

- A coast station must be specified for the "Address ID" (2 leading zeros).
- "Position" or "None" is recommended for the "Message" item, since the traffic frequency is specified by the coast station.
- "INTER2-1" should be used for the call frequency.

```
Telephone
TEL-No
123456789012
3456
Address ID
001234567
ABC port
1st telecom
J3E
Message
Position
position
AUTO
Telephone
2nd telecom
No
information
INTER2-1
T: 2189.5kHz
R: 2177.0kHz
```

- ④ After the display at right appears, push [CALL] momentarily to select the call frequency, then confirm the frequency is not in use.

```
Telephone
call ready
Push 5sec
CALL
```

- ⑤ Push and hold [CALL] for 5 sec. to transmit the telephone call.

- ⑥ After transmitting the call, the transceiver and terminal unit wait for an 'acknowledgement'.

```
Telephone
acknowledge
waiting
```

- ⑦ When the 'acknowledgement' is received, the transceiver is set to the specified traffic frequency, then automatically repeats the 'telephone call'.

```
Telephone
acknowledge
Receive
Telephone
calling
```

- ⑧ The transceiver and terminal unit wait again for the 'acknowledgement' from the coast station.

```
Telephone
acknowledge
waiting
```

- ⑨ When the display at right appears, use the connected telephone line via the transceiver.

Telephone
Connect

- ⑩ After the telephone conversation is finished, push [CALL] for 5 sec. to send an 'End of call' to the coast station.

Tel end
calling

- The transceiver and terminal unit wait for the 'acknowledgement' from the coast station.

Tel end
acknowledge
waiting

- ⑪ When receiving the 'acknowledgement', the display shows as at right.

Telephone
chargeable
duration

- After the acknowledgement, the coast station sends an 'end of connection' and the display shows the chargeable duration.

chargeable
duration
00h12m34s

◇ **Unable to connect**

When your telephone call cannot be completed, the following display appears.

Telephone
acknowledge
timeout

• **Timeout**

When no acknowledgement call is received from the coast station 25 sec. after the telephone call is transmitted.

Telephone
ack receive
Unable to
comply

• **Unable to comply**

Push [ENT] to indicate the reason for the "unable" message. Depending on the reason, re-transmit the telephone call after the problem is solved.

3 CALL PROCEDURE

■ Medical transport announcement

When your ship is carrying a person(s) in need of medical treatment, you must declare this using the 'medical transport' call as defined in the 1947 Geneva Convention.

When selecting the 'Medical transport' call, the terminal unit adopts the following formats for calls automatically.

- Format specifier : All ships call
- Category : Urgency
- 2nd telecommand : Medical transport

① Push [③SEL] to select SEL mode.

```
SEL
Select call
Medical
transport
```

② Rotate [DATA SELECTOR] to select the 'Medical transport' call, then push [ENT].

③ Set the information according to displayed items.

```
Medical
1st telecom
J3E

Frequency

Traffic
T:12345.6kHz
R:12345.6kHz

Call freq
T:_2187.5kHz
R:_2187.5kHz
```

④ After the display at right appears, push [CALL] momentarily to select the call frequency, then confirm the frequency is not in use.

```
Medical
call ready
Push 5sec
CALL
```

⑤ Push and hold [CALL] for 5 sec.
• The transceiver is set to the traffic frequency automatically.

```
Medical
calling
```

⑥ Announce the message via the transceiver.

■ Position request call

The 'position request' call is used to confirm the specified ship's position. This calling system uses digital signals only, therefore a voice reply is not necessary.

① Push [③ SEL] to select SEL mode.

```

SEL
Select call
Position
request
    
```

② Rotate [DATA SELECTOR] to select the 'Position request' call, then push [ENT].

③ Select (or enter) the 9-digit ID code, then, push [ENT].

- Use [DATA SELECTOR] to select the ID code when the desired ship's ID is pre-programmed.
- Use digit keys to enter 9 digits for a non-programmed ID. Refer to p. 22 for more information.

```

Position req
Address ID
123456789
ICOM INC
    
```

④ Set the information according to displayed items.

- 2177 kHz should be used for ship-to-ship calls.

```

Position req
Category
P
Position req
2nd telecom
N
Position req
SHIP
T: 2177.0kHz
R: 2177.0kHz
    
```

⑤ After the display at right appears, push and hold [CALL] for 5 sec.

- After sending a call, the unit waits for an 'acknowledgement' as at right.

```

Position
call ready
Push 5sec
CALL
Position
acknowledge
waiting
    
```

⑥ When receiving an 'acknowledgement', the display shows the received ID code.

```

Position ack
receive
123456789
ICOM DSC
    
```

⑦ Push [⑨ RCV MSG] to enter RCV MSG mode.

```

RCV MSG 01
Poling
123456789
ICOM DSC
    
```

⑧ Push [ENT], then rotate the [DATA SELECTOR] to indicate the received data.

```

RCV MSG 01
Message
12.34'N
123.45'E
    
```

When no acknowledgement is received:

- ① Wait for 5 min., then call again on the same or different frequency.
- ② If no 'acknowledgement' is received after the 2nd call, wait for at least 15 min. before repeating the call.

3 CALL PROCEDURE

■ Polling call

The polling call is used to check for synchronization with another station.

- ① Push [③ SEL] to select SEL mode, then rotate [DATA SELECTOR] to select the 'Polling' call, then push [ENT].

```
SEL
Select call
Poling
```

- ② Select (or enter) the 9-digit ID code, then, push [ENT].
- Use [DATA SELECTOR] to select the ID code when the desired ship's ID is pre-programmed.
 - Use digit keys to enter 9 digits for a non-programmed ID. Refer to p. 22 for more information.

```
Polling
address ID
123456789
ICOM INC
```

- ③ Set the information according to displayed items.
- 'Routine' should be used as the category.
 - 2177 kHz should be used for ship-to-ship calls.

```
Polling
Category
Routine
2nd telecom
No
information
SHIP
T: _2177.0kHz
R: _2177.0kHz
```

- ④ After the display at right appears, push [CALL] momentarily to select the call frequency, then confirm the frequency is not in use.

```
Polling
call ready
Push 5sec
CALL
```

- ⑤ Push and hold [CALL] for 5 sec.
- After sending the call, the unit waits for an 'acknowledgement' as at right.

```
Polling
acknowledge
waiting
```

- ⑥ When receiving an 'acknowledgement', the display shows the received ID code.
- *This means you are synchronized with the other station.*

```
Polling ack
receive
123456789
ICOM DSC
```

When no 'acknowledgement' is received:

- ① Wait for 5 min., then call again on the same or different frequency.
- ② If no 'acknowledgement' is received after the 2nd call, wait for at least 15 min. before repeating the call.

■ Test call

Testing on the exclusive DSC distress and safety calling frequencies (such as 2187.5 kHz) should be avoided as much as possible by using other methods. When testing on the distress/safety frequency is unavoidable, it should be indicated that these are test transmissions.

Normally the test call would require no further communications between the two stations involved.

① Push [SEL] to select SEL mode.

```

SEL
Select call
Test
    
```

② Rotate [DATA SELECTOR] to select the 'Test' call, then push [ENT].

③ Select (or enter) the 9-digit ID code, then, push [ENT].

- Use [DATA SELECTOR] to select the ID code when the coast stations' ID is pre-programmed.
- Use digit keys to enter 9 digits for a non-programmed ID (start with two leading zeros for a coast station). Refer to p. 22 for more information.

```

Test
Address ID
001234567
ABC Port
    
```

④ Rotate the [DATA SELECTOR] to set the call frequency.

- Only distress/safety frequencies can be selected.

```

Test
Call freq
T: _2187.5kHz
R: _2187.5kHz
    
```

⑤ After the display at right appears, push [CALL] momentarily to select the call frequency, then confirm the frequency is not in use.

```

Test
call ready
Push 5 sec
CALL
    
```

⑥ Push and hold [CALL] for 5 sec.

- After sending the call, the unit waits for an 'acknowledgement' as at right.

```

Test
acknowledge
waiting
    
```

⑦ When receiving an 'acknowledgement', the display shows the received ID code.

```

Test ack
receive
001234567
ABC Port
    
```

3 CALL PROCEDURE

■ Data input procedures

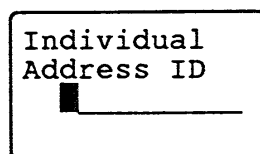
◇ Address ID input

The following methods are available for selecting an address, such as for an 'individual' call:

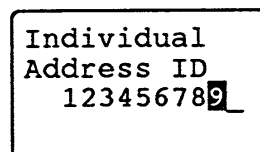
- Rotate [DATA SELECTOR] to select the ID from pre-programmed memories.
- Input the desired ID via digit keys.
- Search desired IDs from name fields.

ID INPUT AND ID SEARCH

- ① When "Address ID" is displayed, push a digit key to set the display for ID input condition.
 - 10 underline bars appear instead of the ID code.
- ② Push the desired ID code using numeral keys, or input an ID name (full spelling or beginning of the name), then push [ENT].
- ③ When ID name search is used, specified ID is indicated in the display. Rotate [DATA SELECTOR] to select another ID.

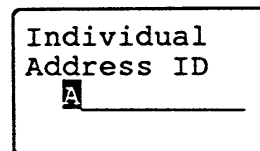


Individual
Address ID



Individual
Address ID
123456789

ID code input



Individual
Address ID
A

ID name search

NOTES:

- Although the ID code is 9-digits, 10 underline bars appear, since up to 10 characters can be input for the ID name.
- When pushing the same number twice, alphabet characters appear (e.g. '3, 3' → 'D'). Use [DATA SELECTOR] before the second push, in such cases.

◇ Frequency input

Traffic frequency and call frequency can be changed from the pre-programmed frequencies. Note that the call frequency can be changed only when the 'ships business' or 'routine' is selected as the category, since the other categories must be used for one of six fixed emergency frequencies.

USABLE FREQUENCY COVERAGE:

1.6 – 2.9999 MHz,	4.0 – 4.9999 MHz
6.0 – 6.9999 MHz,	8.0 – 8.9999 MHz
12.0 – 13.9999 MHz	16.0 – 17.9999 MHz
18.0 – 19.9999 MHz	22.0 – 22.9999 MHz
25.0 – 27.50000 MHz	

- ① When “Traffic freq” or “Call freq” is displayed, rotate the [DATA SELECTOR] to select the pre-programmed frequency; or,

```
Individual
Traffic freq
T:12345.0kHz
R:12345.0kHz
-----
ABCDEFGH
T: _6000.0kHz
R: _6000.0kHz
```

- ② Push a digit key to set the display for frequency input condition.

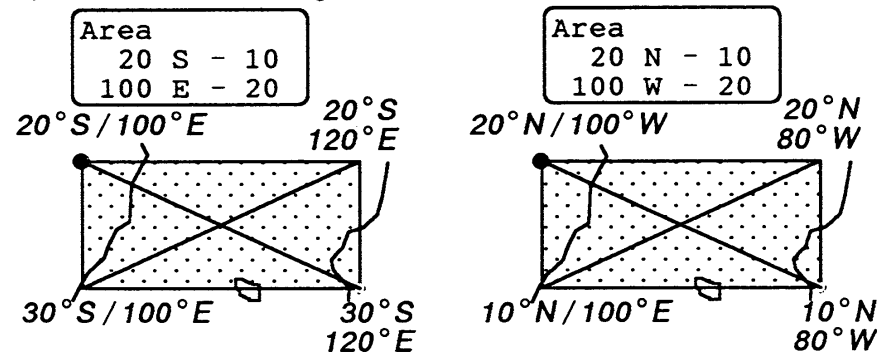
```
Individual
Traffic freq
T: [ ] . [ ] kHz
R: [ ] . [ ] kHz
```

- ③ Push the desired frequency using numeral keys, then push [ENT].
- When input frequencies are out of the range described on the opposite page, the previous frequency pair appears.

```
Individual
Traffic freq
T:085000.0kHz
R:085000.0kHz
```

◆ Area input

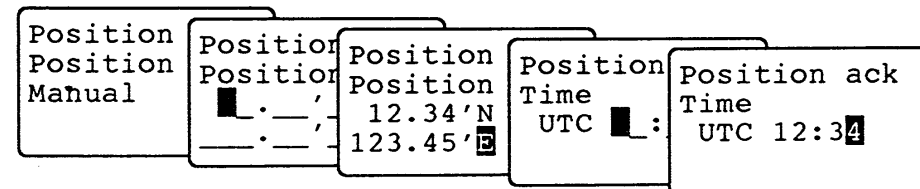
When using the ‘Geographical area’ call, your original position is always the upper left hand corner in the world map as in the following illustration.



Use [6 N] or [7 S] for latitude input and [3 E] or [9 W] for longitude input.

◆ Manual position input

When a navigation receiver is not connected to the GM-110DSC, manual position input is necessary for some acknowledgements, etc. as below.



Use [6 N] or [7 S] for latitude input and [3 E] or [9 W] for longitude input.

4

WHEN RECEIVING A CALL

■ To receive a DSC call

The GM-110DSC scans all distress/safety frequencies, therefore, the 'distress', 'urgency' and 'safety' calls can be decoded at all times.

However, 'routine' and 'ships business' categories are received via the transceiver. Therefore, the transceiver must be set to scan via the GM-110DSC's [② SCAN] key to decode these categories.

The 'routine' and 'ships business' categories may be used for 'individual' and 'position request' calls, etc.

◇ When receiving a DSC call

You should act in one of the following ways depending on the received DSC format (or category):

- Wait for a voice transmission on the traffic frequency.
- Transmit an acknowledgement with DSC or voice.
- Transmit a distress relay call (only when the ship in distress requires voice communications).

◇ Display example and operation

• Monitoring the traffic frequency and...

Monitor the communication between the calling ship and a coast station. When no communication is made, contact the ship using voice transmission.

- Emergency alarm sounds until pushing [① ALM STOP]. Refer to p. 29 for distress relay call.

```
Distress
receive
123456789
```

Distress call

```
Distress rel
receive
123456789
```

Distress relay call

• Monitoring the traffic frequency

The calling station transmits via voice on the traffic frequency.

- Emergency alarm (or continuous beep depending on the category) sounds until pushing [① ALM STOP].

```
All ships
receive
123456789
```

All ships call
or Medical
transport call

```
Area
receive
123456789
```

Geographical
area call

```
Group
receive
123456789
ABCDEFG
```

Group call

- **Transmit an acknowledgement.**

When the following DSC is received, an 'acknowledgement' must be sent back to the calling station.

- Continuous beeps (or emergency alarm depending on the category) sound until pushing [① ALM STOP].

Individual
receive
123456789
ABCDEFG

Individual call

Position req
receive
123456789
ABCDEFG

Position request
call
(position data
must be input)

Polling
receive
123456789
ABCDEFG

Polling call

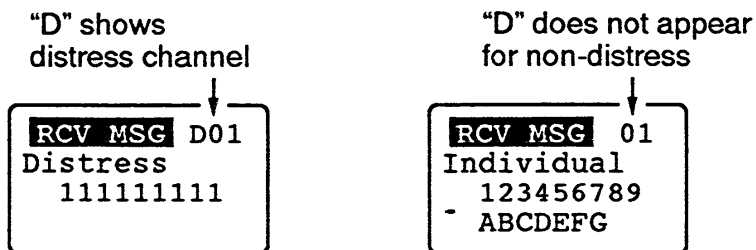
4 WHEN RECEIVING A CALL

■ Received information (RCV MSG)

When receiving a DSC call, the received format specifier and its contents are memorized into the RCV MSG memory. Distress calls (including other calls with distress category) are stored separately from other calls.

Up to 20 distress calls can be memorized and up to 10 other categories of calls can be memorized. However, the distress calls are saved until being erased, other calls are erased when the power is turned OFF.

- ① Push [Ⓞ RCV MSG] to enter RCV MSG mode.
 - Most recently received call is assigned to channel D01 (for distress category) or channel 01 (for other categories).



- ② Rotate [DATA SELECTOR] to select the desired message channel.

RCV MSG D02
Distress
22222222

- ③ Push [ENT] to indicate the message channel contents.

RCV MSG D02
Nature
Undesignate

- ④ Rotate [DATA SELECTOR] to scroll the contents as described on the page opposite.

- ⑤ Push [ENT] to exit RCV MSG mode.
 - The transceiver is set to the specified traffic frequency automatically.
 - The contents of 'acknowledgement' in SEL mode are set to the selected call.

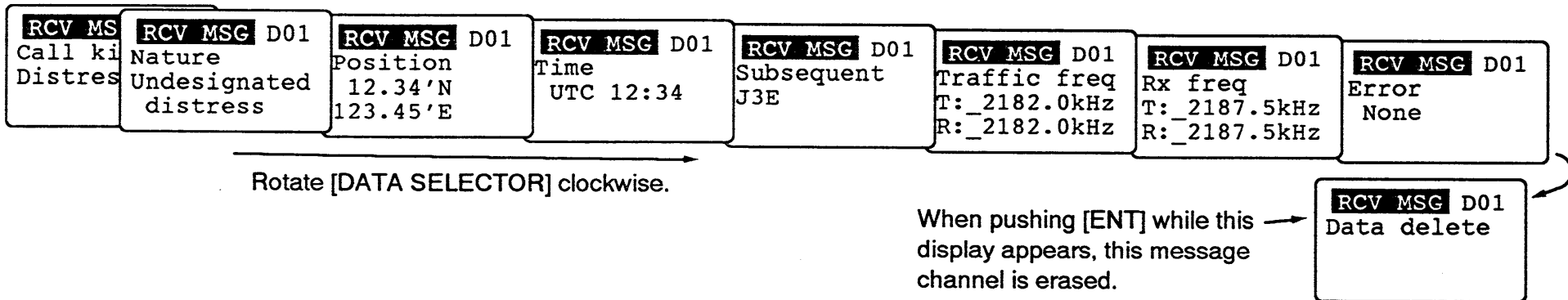
DSC Watch
UTC 12:34

TO ERASE THE CHANNEL

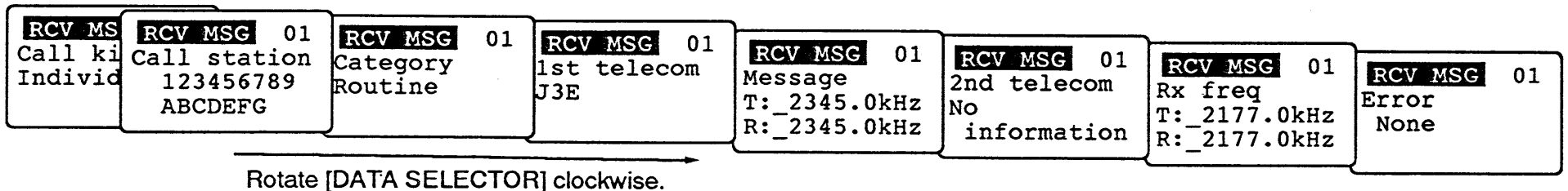
- For distress memory:
 - Push [ENT] when "Data delete" is displayed.
- For non-distress memories:
 - Turn the power OFF, then ON again.

◇ Received information example

• Distress call

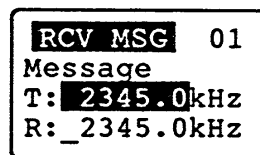


• Individual call



◇ Error data

When the data cannot be decoded correctly, it is displayed “reversed”. You should not send an ‘acknowledgement’ or relay call in such cases.



◇ Print out

The memorized messages can be printed out when a printer is connected.

- Push [Ⓞ PTR] while “RCV MSG” is indicated. All messages are printed out.

4 WHEN RECEIVING A CALL

■ Distress call

The GM-110DSC has distress relay call and distress acknowledgment call formats. However, they can be used **ONLY** when:

Distress relay call:

- The ship in distress cannot transmit the distress call itself.
- When two or more distress call sequences are received from the same ship (the call appears unable to reach a coast station).

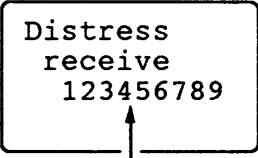
Distress acknowledgement:

/// **AVOID** using the 'distress acknowledgement' since it is permitted for coast stations only, except in the following situations:

- When you received a request from a coast station to send an acknowledgement to the ship directly.
- In your judgement, the ship in distress cannot continue radio communications.

/// **NOTE:** If you transmit a distress acknowledgement, you must inform a coast station of such.

- ① When receiving a distress call, emergency alarm sounds and the display at right appears.

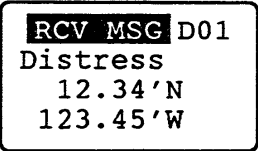


```
Distress
receive
123456789
```

Ship's ID in distress

- ② Push [① ALM STOP] to stop the alarm, if desired.
 - One distress call sequence is sent 5 times repeatedly within approx. 30 sec. The emergency alarm sounds at each reception.
- ③ Push [ENT] to set the transceiver to the distress phone frequency, then monitor communication from the coast station to the ship in distress.

- ④ Push [Ⓞ RCV MSG], [ENT], then rotate [DATA SELECTOR] to check the position of the ship in distress.



```
RCV MSG D01
Distress
12.34'N
123.45'W
```

- When the ship is close to you, communication should be monitored continuously.

- ⑤ When two or more distress call sequences are received from the ship, prepare a 'distress relay call' as described on the following pages.

◇ **Distress relay call**

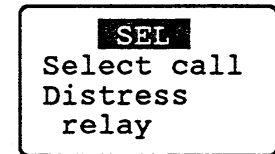
Distress call reception should stop after one sequence since the coast station should send back an 'acknowledgement' to the ship. If the distress call continues, the coast station may not be receiving the call. In such cases, you should contact the ship via phone.

① Contact the ship in distress via phone as below:

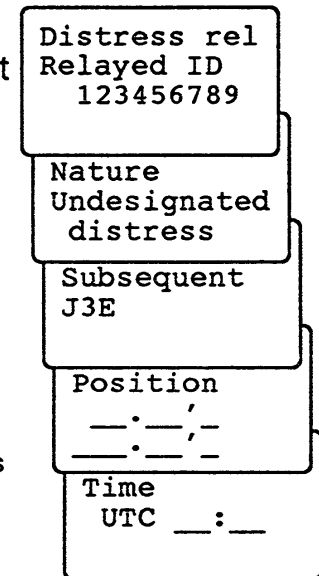
- "MAYDAY".
- The 9-digit identity of the ship in distress, repeated 3 times.
- "This is (your ship name)".
- Your identification, (9-digit identity, call sign or other identification), repeated 3 times.
- "RECEIVED MAYDAY".

② When the ship requires a 'distress relay' call or the ship appears not to reply, proceed as follows for 'distress relay' transmission.

③ Push [SEL], then rotate the [DATA SELECTOR] to select the "Distress relay", then push [ENT].

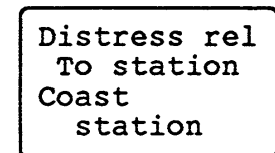


④ Push [ENT] to confirm the received information in the order illustrated at right.



⑤ When no position or UTC data are received, input them, if known.
• If you do not know the distress ship's position, the position should be left blank.

⑥ Select 'All ships' or 'Coast station', using the [DATA SELECTOR].



4 WHEN RECEIVING A CALL

- ⑦ Push [ENT] several times until the display at right appears.

Distress rel
call ready
Push 5sec
CALL

- ⑧ Push push [CALL] momentarily to select the call frequency, then confirm the frequency is not in use.

DSC Watch
12.34'N
123.45'W
GPS 12:34

- ⑨ Push and hold [CALL] to transmit the distress relay call.

Distress rel
Calling

- ⑩ When selecting "Coast station" in step ⑥, "Acknowledgment waiting" appears as at right.

Distress
relay
acknowledge
waiting

◇ Distress acknowledgement

After you transmit a 'distress relay' call, you should send a 'distress acknowledgment' according to coast station requirements.

- ① Push [SEL], then rotate the [DATA SELECTOR] to select "Distress acknowledge", then push [ENT].

SEL
Select call
Distress
acknowledge

- ② Push [ENT] to confirm the received information as displayed.

Distress Ack
Address ID
123456789

- ③ Push [ENT] several times to exit SEL mode.

Distress ack
call ready
Push 5sec
CALL

- ④ Push and hold [CALL] to transmit the distress acknowledgement.
- If the distress call is repeated, your acknowledgement may be transmitted over top of the distress call. Send the acknowledgement again in such a case.

Distress ack
Calling

■ All ships call

When receiving an 'all ships' call, an emergency alarm may sound (or beeps when the category is 'Safety') and the display at right appears.

```
All ships
receive
123456789
```

You must monitor the traffic frequency until you can judge from the call that your action has been effective and/or assistance is unnecessary.

- ① When "All ships" is displayed as above, push [ENT].
 - The transceiver's frequency is set to the received traffic frequency automatically.
- ② Listen to the traffic frequency for an announcement from the calling station.
- ③ Communicate with the ship when the calling ship requires such.
- ④ Push [CTRL OFF] or [② SCAN] when the call does not require any action on your part.

```
DSC Watch
12.34'N
123.45'W
GPS 12:34
```

■ Geographical area call

When receiving a 'geographical area' call and your position is in the specified area, beeps may sound (or the emergency alarm depending on the category) and the display at right appears.

```
Area
receive
123456789
```

NOTE: The terminal unit will not decode the signal when:

- your position is out of the specified area.
- no GPS receiver is connected to the terminal unit and you did not input the position manually.

- ① When "Area" is displayed as above, push [⑨ RCV MSG].
 - The received call is selected in RCV MSG mode.
- ② Push [ENT] to check the contents.
 - The specified area is displayed.
 - To check other contents, rotate the [DATA SELECTOR].
- ③ Push [ENT] to exit RCV MSG mode, then listen to the traffic frequency for an announcement from the calling station.
- ④ Push [CTRL OFF] or [② SCAN] to

```
RCV MSG 01
Are
123456789
```

```
RCV MSG 01
Are
12 N - 30
123 W - 40
```

```
DSC Watch
12.34'N
123.45'W
GPS 12:34
```

4 WHEN RECEIVING A CALL

■ Individual call

When receiving an 'individual' call, beeps may sound (or emergency alarm depending on the category) and the display at right appears.

You must send back an 'acknowledgement' to the calling station in such cases.

① When "Individual" is displayed as above, push [①ALM STOP] to stop the beeps (or emergency alarm).

② Push [③SEL] to enter SEL mode for 'acknowledgement' preparation.

③ Rotate [DATA SELECTOR] to select the "Individual acknowledge" as at right, then push [ENT].

```
Individual
receive
123456789
ICOM DSC
```

Calling station's name appears when the same ID is pre-programmed.

```
SEL
Select call
Individual
```

```
SEL
Select call
Individual
acknowledge
```

④ Push [ENT] several times to confirm the contents of the 'acknowledgement' as illustrated at right.

- Most indications cannot be changed for an 'acknowledgement'.

- The call frequency can be changed by inputting digits. However, DSC connection may be unsuccessful once the frequency is changed.

- To send 'Unable to comply' and its reason, rotate [DATA SELECTOR], when "Comply" appears.

⑤ Push and hold [CALL] to transmit the 'individual acknowledgment'.

- The transceiver is set to the specified traffic frequency after the 'acknowledgement' transmission.

```
Ind ack
Address ID
123456789
ICOM DSC

Category
Routine

1st telecom
J3E

Message
T:12345.0kHz
R:12345.0kHz

2nd telecom
No
information

Ind ack
Call freq
T:_2177.0kHz
R:_2177.0kHz

Ind ack
Comply
Able
```

```
Ind ack
call ready
Push 5sec
CALL
```

■ Group call

When receiving a 'Group' call, beeps may sound (or emergency alarm depending on the category) and the display at right appears.

The group call is an announcement to all ships in your group, therefore, no 'acknowledgement' is available.

```
Group
receive
123456789
ICOM DSC
```

Calling station's name appears when the same ID is pre-programmed.

- ① When "Group ships" is displayed as above, push [ENT].
 - The transceiver's frequency is set to the received traffic frequency automatically.
- ② Listen to the traffic frequency for an announcement from the calling ship (mother ship in your group).
- ③ Communicate via microphone with the ship when the calling ship requires such.
- ④ Push [CTRL OFF] or [② SCAN] when the announcement is finished.

```
DSC Watch
12.34'N
123.45'W
GPS 12:34
```

4 WHEN RECEIVING A CALL

■ Position request call

When receiving a 'position request' call, beeps may sound (or emergency alarm depending on the category) and the display at right appears.

You must send back an 'acknowledgement' to the calling station in such cases.

① When "Position req" is displayed as above, push [① ALM STOP] to stop the beeps (or emergency alarm).

② Push [③ SEL] to enter SEL mode for 'acknowledgement' preparation.

③ Rotate [DATA SELECTOR] to select the "Position req acknowledge" as at right, then push [ENT].

Position req
receive
123456789
ICOM DSC

Calling station's name appears when the same ID is pre-programmed.

SEL
Select call
Individual

SEL
Select call
Position req
acknowledge

④ Push [ENT] several times to confirm the contents of the 'acknowledgement' as illustrated at right.

- Most indications cannot be changed for an 'acknowledgement'.

- The call frequency can be changed by inputting digits. However, DSC connection may be unsuccessful once the frequency is changed.

- When no GPS receiver is connected, your ship position must be input; Select 'Position Manual', then input via digit keys.

⑤ Push and hold [CALL] to transmit the 'position request acknowledgement'.

Position ack
Address ID
123456789
ICOM DSC

Category
Routine

2nd telecom
No
information

call freq
T: _2177.0kHz
R: _2177.0kHz

Position ack
Position
Auto

Position ack
Position
Manual

Position
12.34'N
123.45'E

Time
UTC 12:34

Position ack
call ready
Push 5sec
CALL

■ Polling call

When receiving a 'polling' call, beeps may sound (or emergency alarm depending on the category) and the display at right appears.

You must send back an 'acknowledgement' to the calling station in such cases.

- ① When "Polling" is displayed as above, push [① ALM STOP] to stop beeps (or emergency alarm).
- ② Push [③ SEL] to enter SEL mode for 'acknowledgement' preparation.
- ③ Rotate [DATA SELECTOR] to select "polling acknowledge" as at right, then push [ENT].

```

Polling
receive
123456789
ICOM DSC
    
```

Calling station's name appears when the same ID is pre-programmed.

```

SEL
Select call
Individual
    
```

```

SEL
Select call
Polling
acknowledge
    
```

- ④ Push [ENT] several times to confirm the contents of the 'acknowledgement' as illustrated at right.

- Most indications cannot be changed for 'acknowledgement'.
- The call frequency can be changed by inputting digits. However, DSC connection may be unsuccessful once the frequency is changed.
- The 'polling acknowledgement' has no 'Unable to comply' item, since no further voice contact is necessary.

- ⑤ Push and hold [CALL] to transmit the 'polling acknowledgement'.

```

Polling ack
Address ID
123456789
ICOM DSC
Polling ack
Category
Routine
Polling ack
1st telecom
J3E
Polling ack
Message
T:12345.0kHz
R:12345.0kHz
Polling ack
2nd telecom
No
information
Polling ack
Call freq
T: 2177.0kHz
R: 2177.0kHz
    
```

```

Polling ack
call ready
Push 5sec
CALL
    
```

5

MENU MODE OPERATION

General

Up to 100 ID codes and 35 pairs of frequencies can be programmed in MENU mode for easy recall during SEL mode setting.

In addition, the following settings/operations are available in MENU mode.

- Manual position/time setting
- Automatic print function ON/OFF
- Encoder/decoder self-testing
- Self-ID indication

Position setting

In general, a GPS unit should be connected to the terminal unit, therefore no position setting is necessary. However, when no GPS unit is connected, or when data is interrupted accidentally, your position must be set (or renewed) manually.

When GPS data is received, "GPS" appears for 30 sec. as shown at right. Position setting is disabled in such a case.

```
DSC Watch
12.34'N
123.45'W
GPS 12:34
```

The UTC time setting is also necessary after setting position data which includes the time. Check the time before sending a DSC call—when incorrect time, the position and time should be re-input.

TIME SETTING PROCEDURE:

- ① Push [7 MENU] to select MENU mode.
- ② Rotate [DATA SELECTOR] to select the "Position set" display, then push [ENT].
- ③ Input the position data via the numeral keys, then push [ENT].
 - Use [6 N] or [7 S] for latitude input and [3 E] or [9 W] for longitude input.
- ④ Set the UTC time via the numeral keys, then push [ENT].

```
MENU
Select work
Position set
```

```
MENU
Position
┌. _/_
└. _/_
```

```
MENU
Select work
UTC ┌: _
```


■ ID input

A total of 100 ID codes can be programmed as “Address ID” (for ships and coast stations) and “Group ID” (for group station). A pair of frequencies are also programmed together with the ID code which are used as call frequencies when using the ID code.

NOTE: An ID channel cannot be programmed when the same ID number or name has been programmed into another ID channel.

PRINTING OUT THE ID LIST:

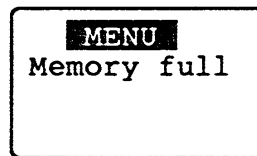
The programmed ID as well as the frequencies and name can be printed out when a printer is connected.

- Push [⑩ PTR] after indicating the desired “input” display (step ② in the procedure at right).

MEMORY FULL:

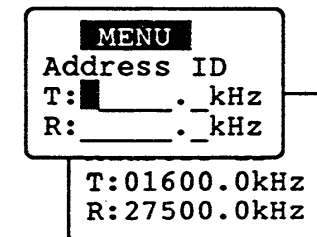
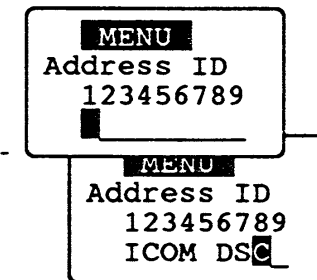
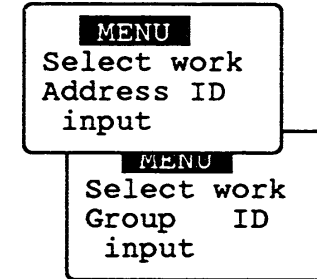
When the display at right appears after pushing [ENT] in step ② at right, ID codes have been programmed in more than 100 channels.

Delete any unneeded IDs in such cases (p. 39 for delete)



SETTING PROCEDURES:

- ① Push [⑦ MENU] to select MENU mode.
- ② Rotate [DATA SELECTOR] to select the “Address ID” or “Group ID” display, then push [ENT].
- ③ Push numeral keys to input an ID code, then push [ENT].
 - When a wrong number is input, push [CLR], then input again.
- ④ Enter the desired name for the ID code, then push [ENT].
 - Push the corresponding key one or more times to input the desired character.
 - To erase a character, overwrite a 'space' using [① QZ].
- ⑤ Enter the call frequencies for transmit and receive separately, then push [ENT].
 - Only frequencies within the marine band are acceptable.



5 MENU MODE OPERATION

■ Frequency input

A total of 35 frequencies can be programmed as “Scan”, “Call” and “Traffic” frequencies. A name is also programmed together with the frequency and appears when using the frequencies in SEL mode.

NOTE: A scan channel cannot be programmed when the same receive frequency has been programmed into another scan channel.

PRINTING OUT THE FREQUENCY LIST:

The programmed frequencies as well as the name can be printed out when a printer is connected.

- Push [PTR] after indicating the desired “input” display (step ② in the right procedure).

MEMORY FULL:

When the display at right appears after pushing [ENT] in the step ② at right, frequencies have been programmed in more than 35 channels (or more than 6 channels for scan freq.).

Delete any unneeded frequency pairs in such cases (p. 39 for delete).

```
MENU
Memory full
```

SETTING PROCEDURES:

- ① Push [MENU] to select MENU mode.
- ② Rotate [DATA SELECTOR] to select the “Scan freq”, “Call freq” or “Traffic freq” with the “input” display, then push [ENT].

```
MENU
Select work
Call freq
input
Traffic freq
input
Scan freq
input
```

- ③ Enter frequencies for transmit and receive separately, then push [ENT].
 - Only frequencies within the marine band are acceptable.

```
MENU
Call freq
T: _____. kHz
R: _____. kHz
T: 01600.0 kHz
R: 27500.0 kHz
```

- ④ Enter the desired name for the frequency, then push [ENT].
 - Push the corresponding key one or more times to input the desired character.
 - When you want to use the same key for the next character, use the [DATA SELECTOR] to move the cursor.
 - To erase a character, overwrite a “space” using [QZ].

```
MENU
Call freq
MENU
Call freq
ICOM DSC
```

■ ID/frequency delete

Unnecessary frequencies or ID codes can be deleted from MENU memories with the following procedure:

The programmed ID or frequencies can be printed out before deleting when a printer is connected.

- Push [⑩ PTR] after indicating the desired “delete” display (step ② below).

- ① Push [⑦ MENU] to select MENU mode.
- ② Rotate [DATA SELECTOR] to select the item with “delete” indication, then push [ENT].

```
MENU
Select work
Address ID
delete
```

```
MENU
Select work
Group ID
delete
```

```
MENU
Select work
Scan freq
delete
```

```
MENU
Select work
Call freq
delete
```

```
MENU
Select work
Traffic freq
delete
```

- ③ Rotate [DATA SELECTOR] to select the contents you want to delete, then push [ENT].

■ Automatic print

Each time a DSC call is received, the information is not only memorized into a RCV MSG channel but also printed out to the connected printer.

TURNING AUTO PRINT ON/OFF:

- ① Push [⑦ MENU] to select MENU mode.

```
MENU
Select work
Auto print
Select
```

- ② Rotate [DATA SELECTOR] to select the “Auto print” display then push [ENT].

- ③ Rotate [DATA SELECTOR] to turn the automatic printout function ON and OFF.

```
MENU
Auto print
ON
```

/// An IBM® centronics or compatible printer can be connected to the GM-110DSC. Refer to p. 56 for printer socket pin assignments.

5 MENU OPERATION

■ Self testing

According to regulations, the GM-110DSC has a self testing capability to check the internal AFSK encoder and decoder circuits without signal transmission via the transceiver.

SELF TEST OPERATION:

- ① Push [⑦ MENU] to select MENU mode.
- ② Rotate [DATA SELECTOR] to select the "Self test" display.
- ③ Push [ENT] to start the self test.
- ④ "Self test OK" appears when both the encoder and decoder are functioning correctly.
 - If the circuit has a problem, the following display appears.

```
MENU
Self test
  NG
```

Encoder or both decoders have a problem.

```
MENU
Self test
SCAN RX
DECODER NG
```

The decoder for the internal scanner has a problem.

```
MENU
Select work
Self test
```

```
MENU
Self test
Working
```

```
MENU
Self test
  OK
  156200
```

```
MENU
Self test
EXIT AF
DECODER NG
```

The decoder for the transceiver has a problem

■ Self ID indication

Your ID code appears for 1 sec. at power ON. If you wish to check your ID code without turning power OFF or for more than 1 sec., your ID code can be displayed via MENU mode.

INDICATION PROCEDURE

- ① Push [⑦ MENU] to select MENU mode.
- ② Rotate [DATA SELECTOR] to select the "Self ID" display.
- ③ Push [ENT] to indicate your ID.

```
MENU
Select work
Self ID
display
```

```
MENU
Self ID
123456789
```

■ Memory description

The GM-110DSC has several kinds of memories as follows:

- Format/contents memory(described in this section)
- ID code memory with call freq. (p. 37)
- Call/traffic freq. memory with name (p. 38)
- Received message memory (p. 26)

9 format/contents memory channels allow you to set often used format specifiers and contents such as for telephone calls, individual calls, etc.

PRINTING OUT THE PROGRAMMED CONTENTS:

The programmed format specifiers as well as other contents can be printed out when a printer is connected.

- Push [⑩ PTR] after indicating the desired “**MW**” or “**MR**” display.

■ Memory writing

- ① Select the desired format and set the comments using SEL mode.

SEL
Select call
Individual

- ② After exiting SEL mode, push [⑤ MW], then push the desired number key [①] to [⑨] for the memory channel number.

MW
Please push
1 - 9 KEY

■ Memory reading

- ① Push [⑧ MR], then push the desired memory channel number with the [①] to [⑨] key.

MR
Please push
1 - 9 KEY

- ② The recalled memory's format appears for 0.5 sec. and the memory is selected.

MR
Individual
call ready

- ③ Push and hold the [CALL] key for 5 sec. to transmit the selected DSC call.

■ Scan operation

The GM-110DSC has up to 6 scan channels to control the connected transceiver and monitor for 'ships business' or 'routine' category DSC calls. Note that other categories use emergency frequencies and can be received with the internal scanner of the GM-110DSC, therefore, transceiver control is not necessary.

Before operating the transceiver scan, program the scan frequencies in the GM-110DSC. Refer to p. 38 for programming details.

- ① Push [② SCAN] to start the scan function.

```
DSC Watch
12.34'N
123.45'W
GPS 12:34
```

- ② When receiving a DSC call, scan pauses.

- Scan resumes after receiving the complete DSC call.

```
Individual
receive
123456789
ICOM DSC
```

- ③ To cancel the scan, push [CTRL OFF].

- The transceiver returns to the previous frequency.

```
Control OFF
12.34'N
123.45'W
GPS 13:00
```

■ Auto acknowledgement

When you cannot transmit an 'acknowledgement' (e.g. you are away from the transceiver), the auto acknowledgement function is available to send back an 'acknowledgement' automatically. The auto acknowledgement does not function for 'distress' or 'distress relay' calls.

- ① Push [CALL] or [SCAN] to select the "DSC Watch" condition.

```
DSC Watch
12.34'N
123.45'W
GPS 12:34
```

- ② Push [⑥ AUTO ACK] to enter AUTO ACK mode.

```
AUTO ACK
Select ack
OFF
```

- ③ Rotate the [DATA SELECTOR] to select "Unable to comply" to turn the automatic acknowledgement function ON.

```
AUTO ACK
Select ack
Unable to
comply
```

- ④ Push [ENT], then rotate [DATA SELECTOR] to select the reason, then push [ENT] again.

- See p. 53 for selectable reasons.

```
AUTO ACK
Reason
Operator
unavailable
```

- ⑤ To turn OFF the auto acknowledgement, push [CTRL OFF].

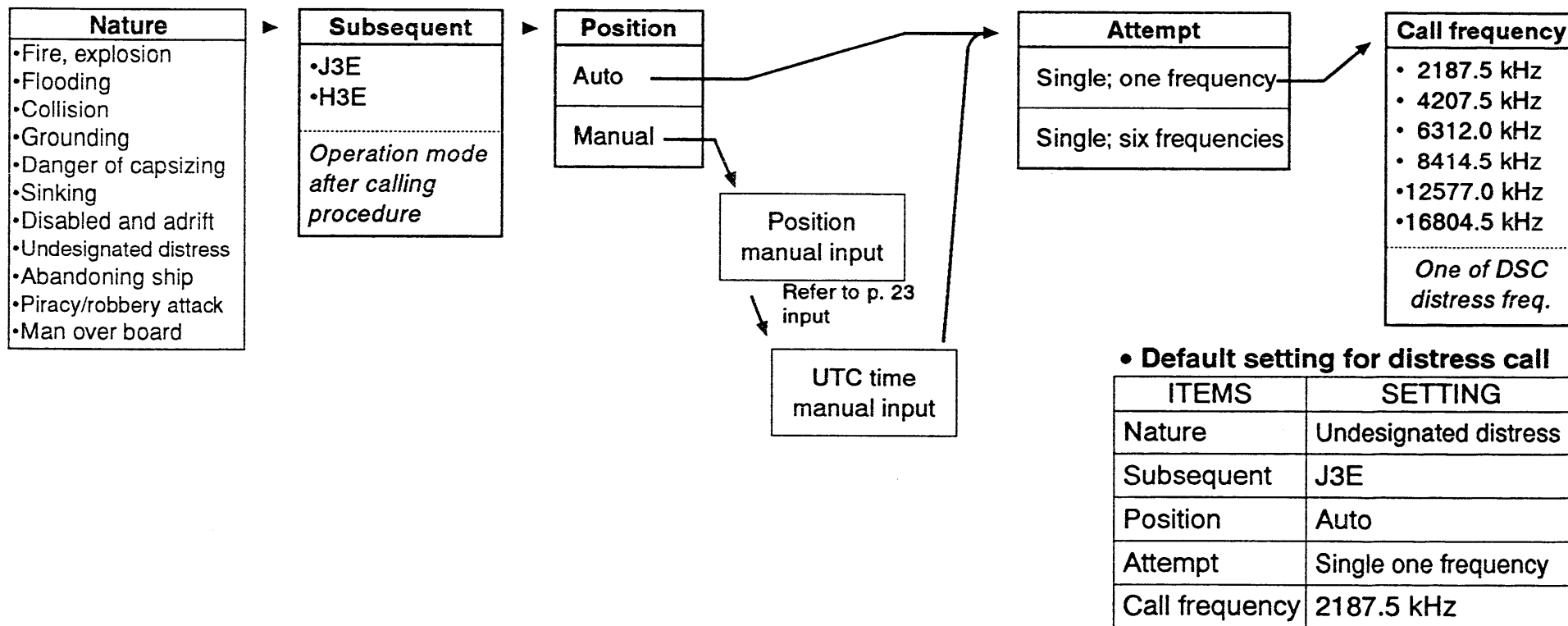
■ Printout

The information in RCV MSG mode can be printed out to the connected printer. An IBM® centronics or compatible printer can be connected to the GM-110DSC.

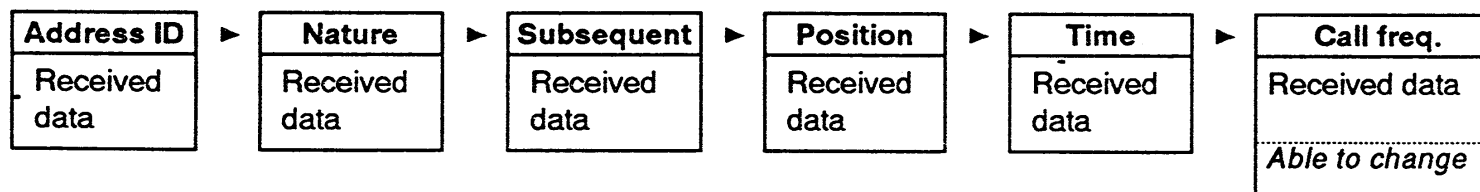
PRINTOUT PROCEDURE

- ① Push [⑨ RCV MSG] to select RCV MSG mode.
- ② Rotate [DATA SELECTOR] when you want to print out the desired call only, then push [ENT].
 - If you want to print out all received calls, skip this step.
- ③ Push [⑩ PTR] to print out memorized information.

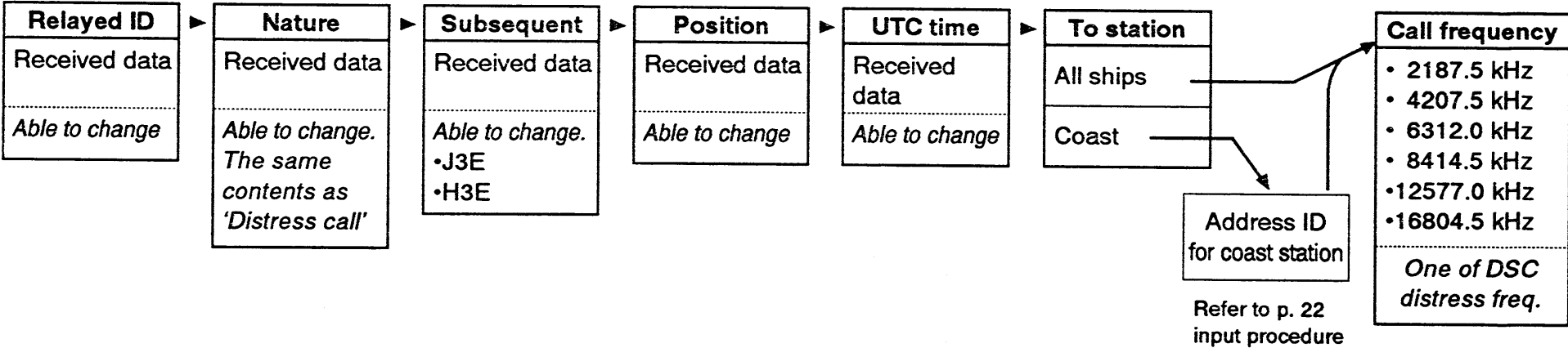
Distress call



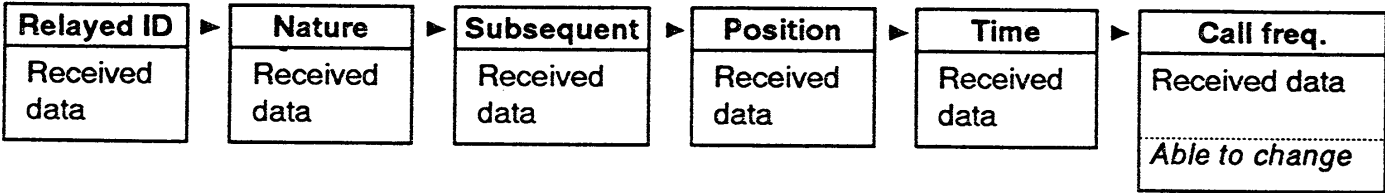
Distress acknowledgement



Distress relay call



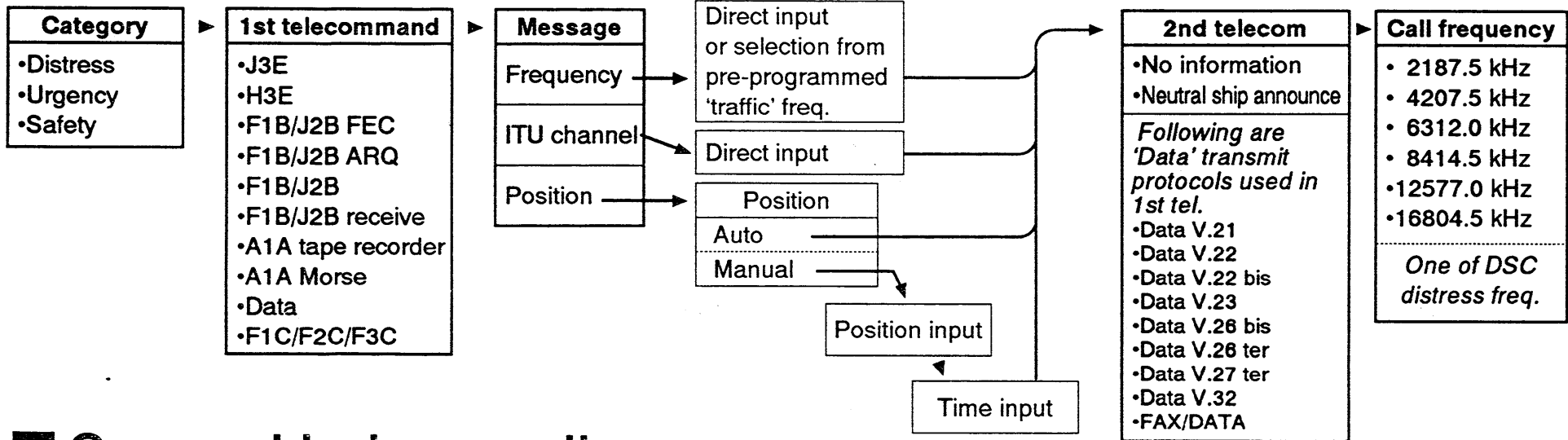
Distress relay acknowledgement



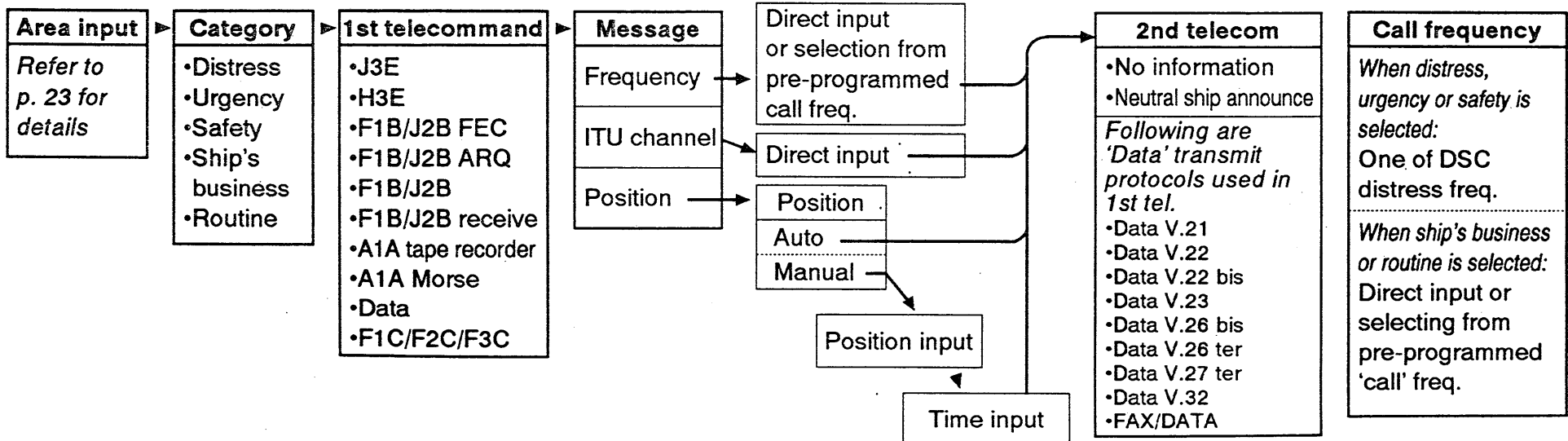
//// Distress relay acknowledgement can be used only when a distress relay call is received from a COAST station.

8 SELECTABLE CONTENTS

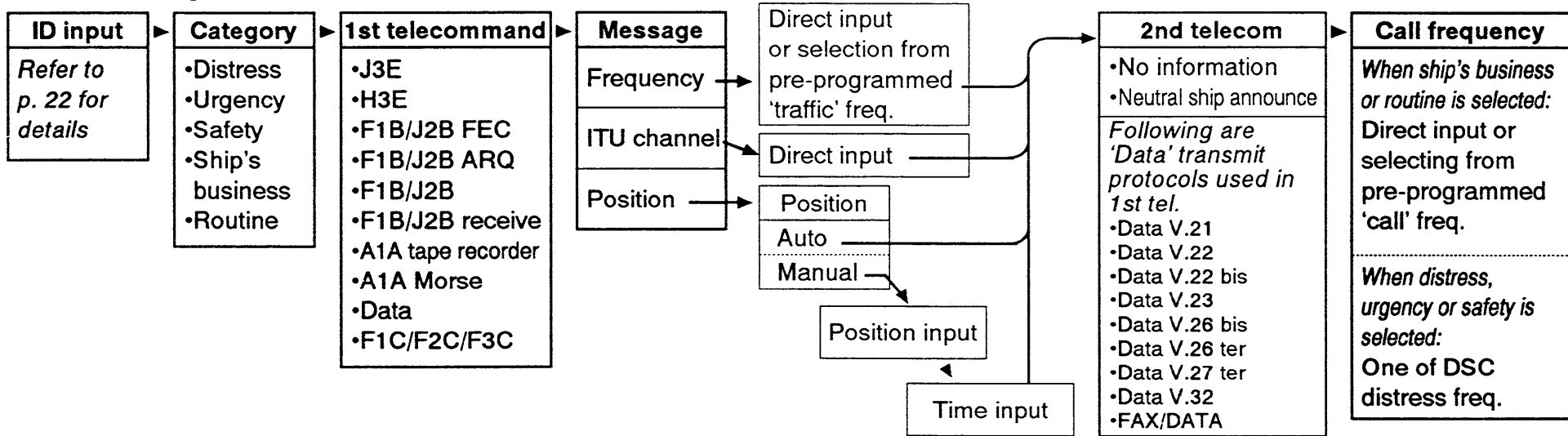
All ships call



Geographical area call

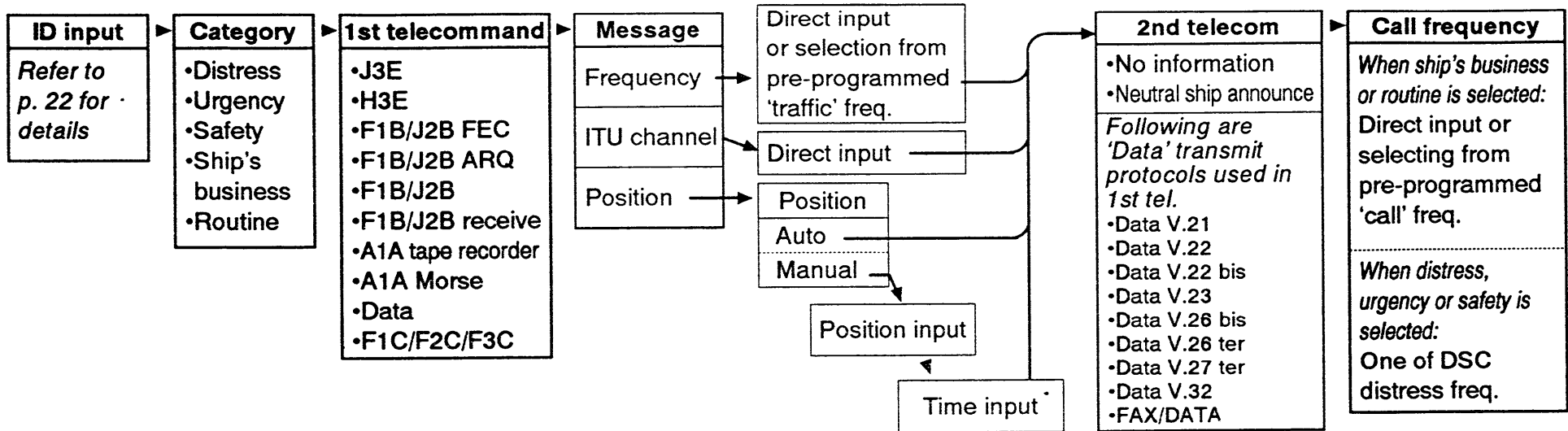


■ Group call

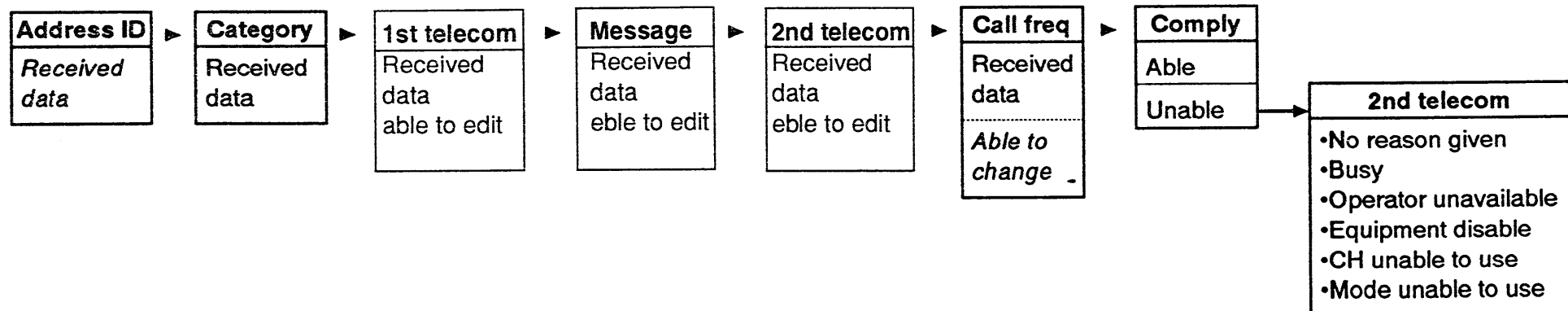


8 SELECTABLE CONTENTS

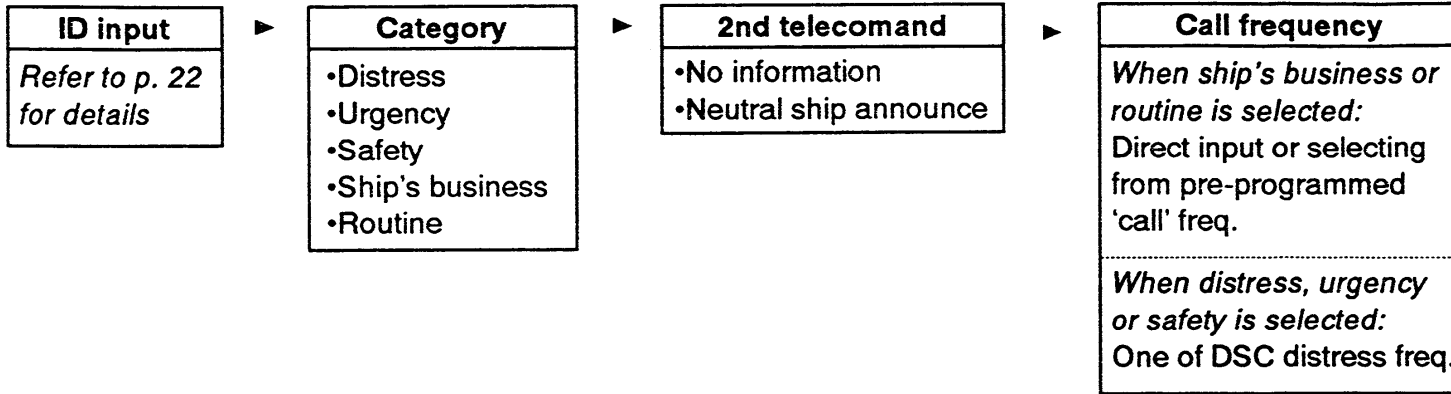
Individual call



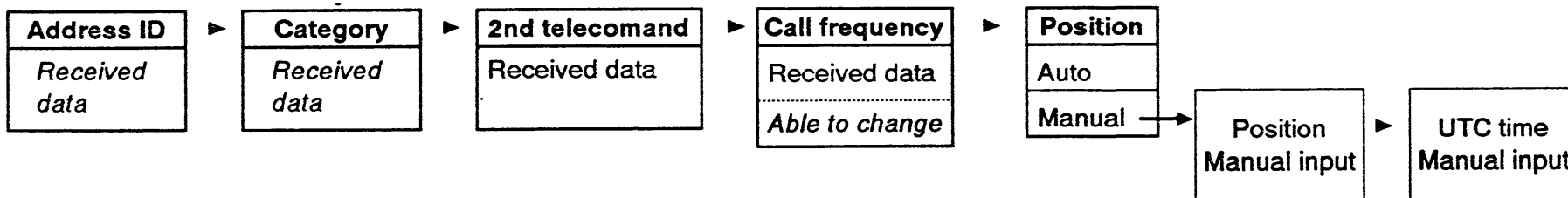
Individual acknowledgement



■ Position request call

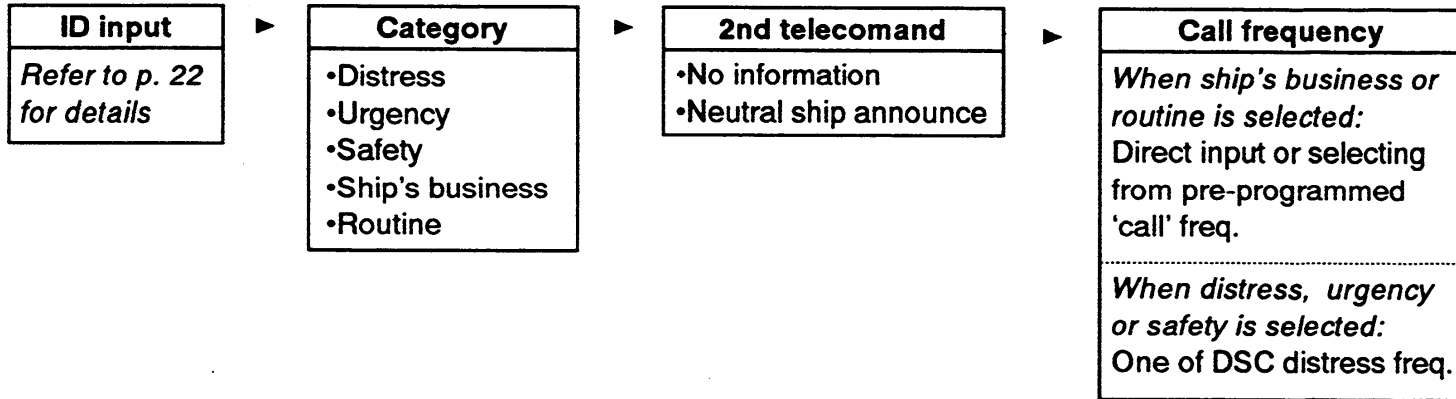


■ Position request acknowledgement

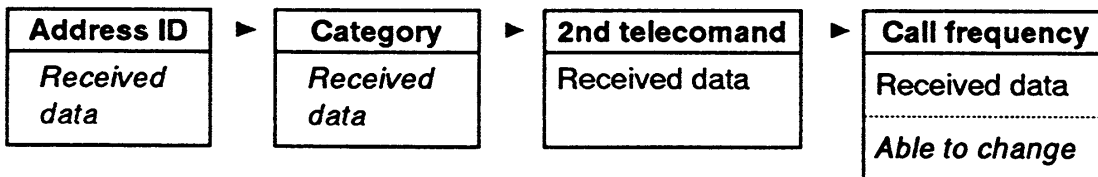


8 SELECTABLE CONTENTS

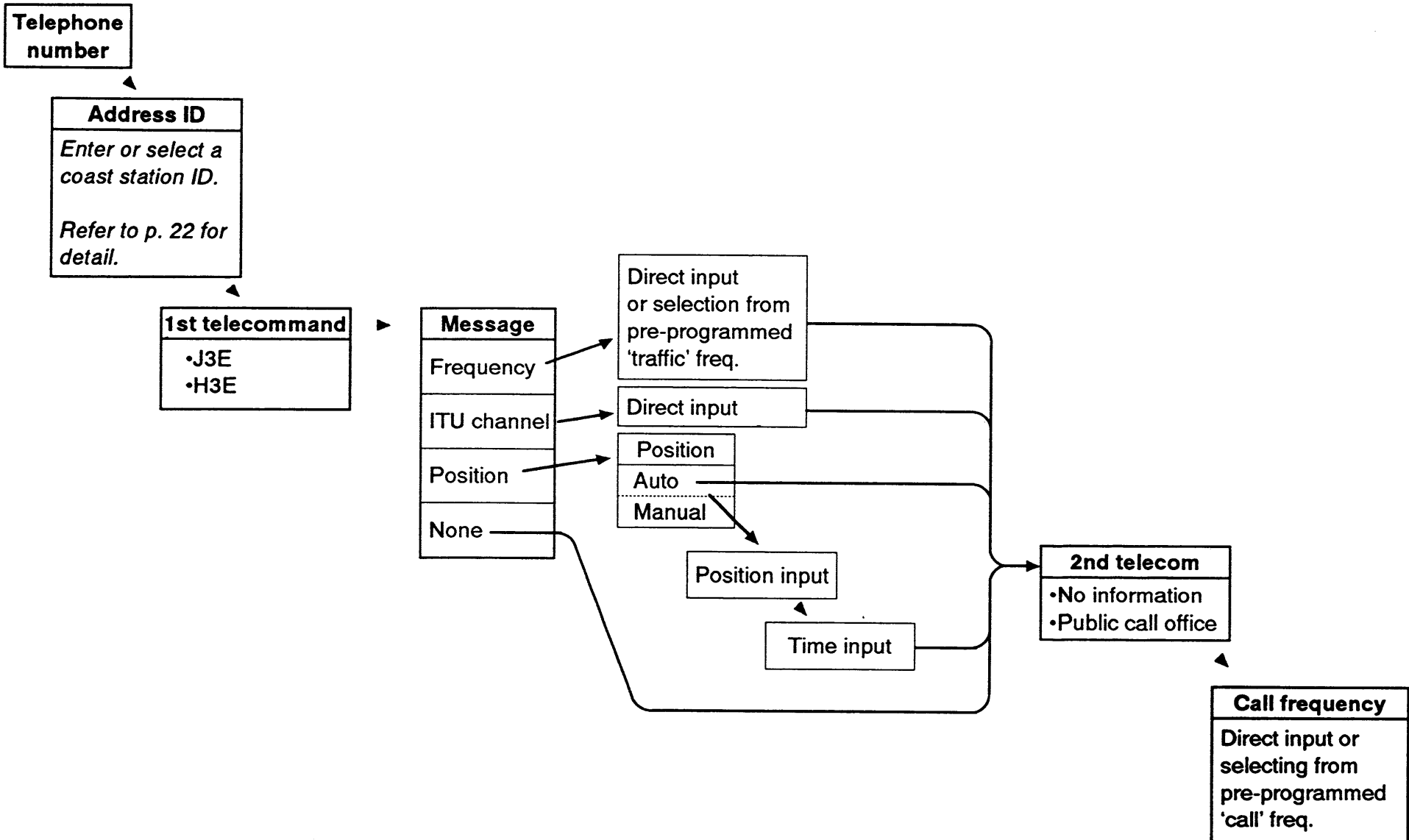
■ Polling call



■ Polling acknowledgement

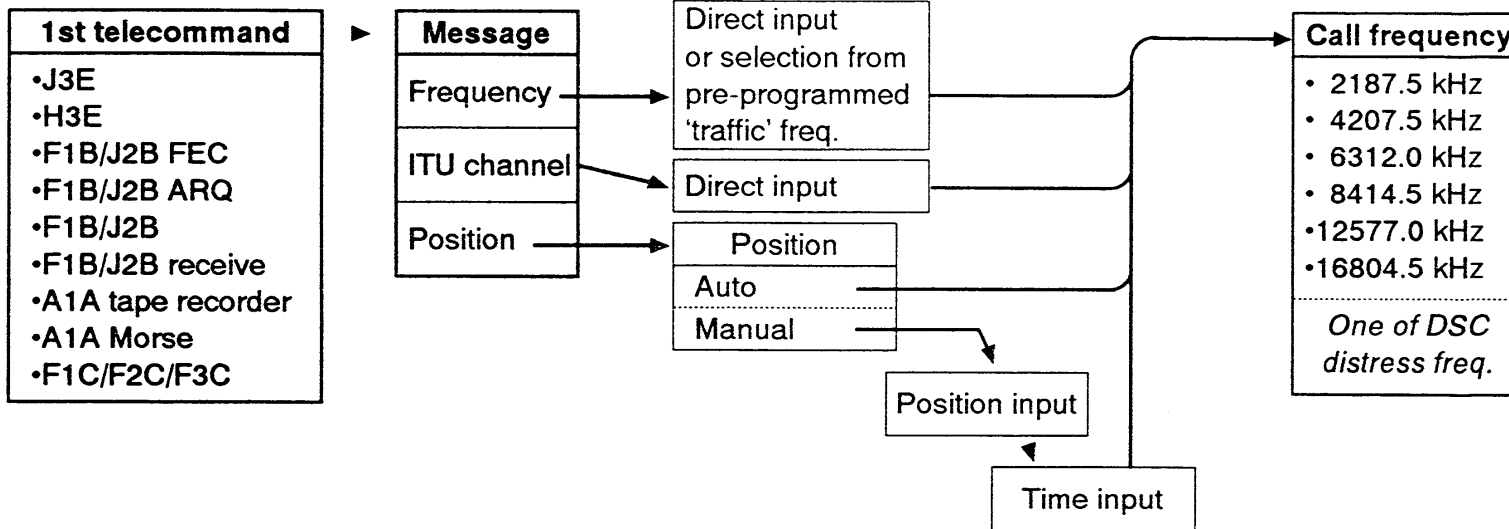


■ Telephone call



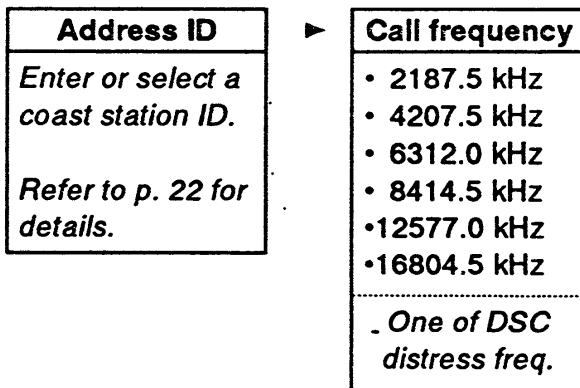
8 SELECTABLE CONTENTS

Medical transport call



The following contents are fixed and not indicated:
 •Format specifier:
 All ships call
 •Category:
 Urgency
 •2nd telecommand:
 Medical transport

Test call



■ Selectable information

◇ Nature of distress

<ul style="list-style-type: none"> • Fire, explosion • Flooding • Collision • Grounding 	<ul style="list-style-type: none"> • Sinking • Disabled and adrift • Undesignated distress • Abandoning ship • Piracy/robbery attack • Man and over board
---	---

◇ Category

<ul style="list-style-type: none"> • Distress • Urgency • Safety 	All ships call has these 3 categories only
<ul style="list-style-type: none"> • Ship's business • Routine 	Other general calls have these 2 categories additionally.

◇ 2nd telecommand

<ul style="list-style-type: none"> • No information • Neutral ship announce 	Usable with almost selective calls
<ul style="list-style-type: none"> • Data V.21 • Data V.22 • Data V.22 bis • Data V.23 • Data V.26 bis • Data V.26 ter • Data V.27 ter • Data V.32 • FAX/DATA 	Usable only when "Data" is selected in the 1st telecommand
<ul style="list-style-type: none"> • No reason given • Busy • Operator unavailable • Equipment disable • Channel unable to use • Mode unable to use 	Usable for an 'acknowledgement' only
<ul style="list-style-type: none"> • Public call office 	Usable for 'Telephone' call

◇ 1st telecommand

Use and/or mode	Terminal equipment
<ul style="list-style-type: none"> • J3E • H3E • F1B/J2B FEC • F1B/J2B ARQ • F1B/J2B • F1B/J2B receive • A1A tape recorder • A1A Morse • Data • F1C/F2C/F3C 	<ul style="list-style-type: none"> Telephone Telephone Teleprinter (NBDP) Telex/teleprinter (NBDP) Teleprinter Teleprinter Tape recorder for Morse Morse key Modem (2nd telecommand) Facsimile

FEC: Forward Error Correction System

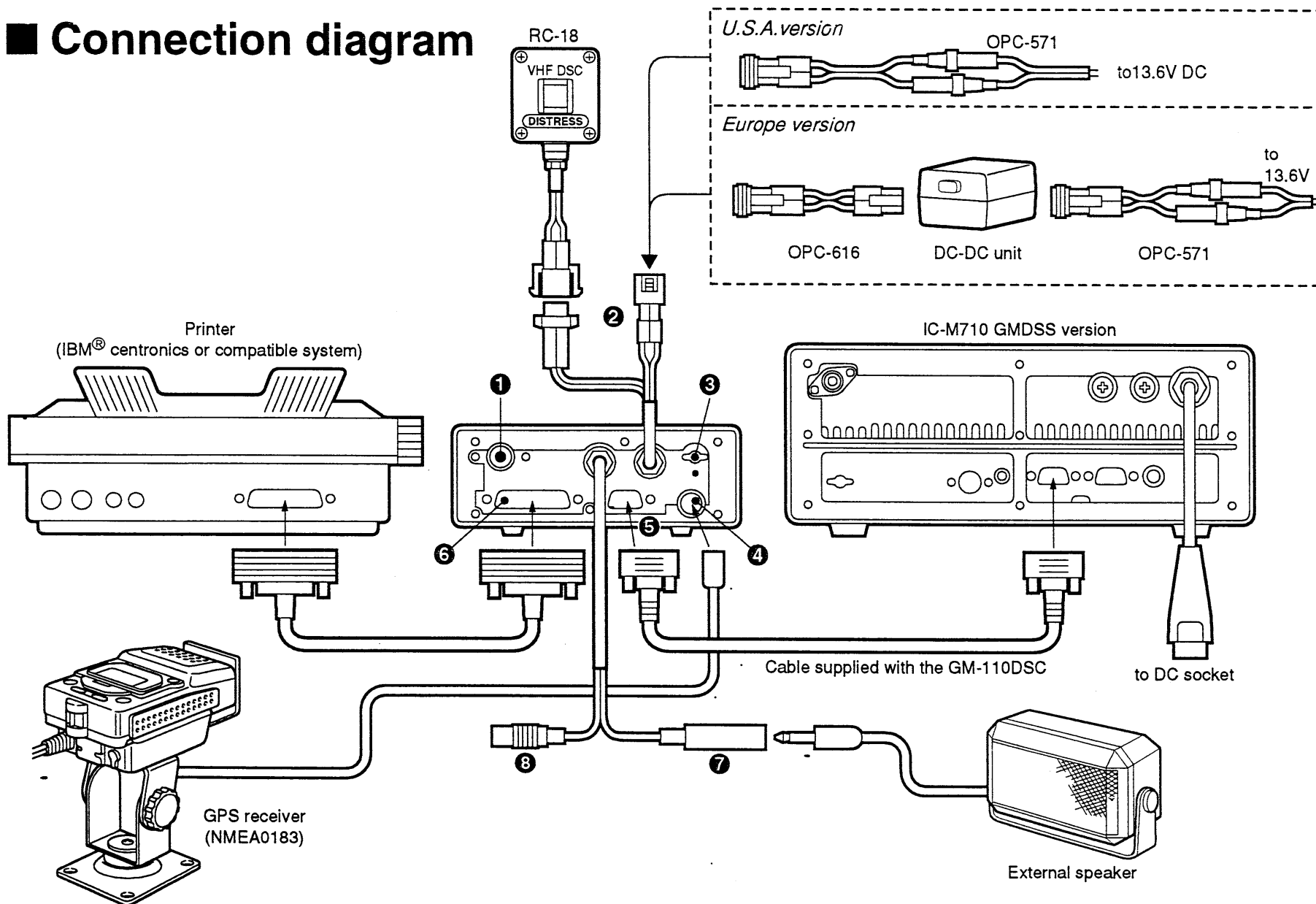
ARQ: Automatic Request of Repetition

NBDP: Narrow Band Direct Printing Equipment

9

CONNECTION AND INSTALLATIONS

■ Connection diagram



■ Rear panel description

① ANTENNA CONNECTOR

Connects a 50 Ω antenna with a PL-259 plug for emergency frequency signal receiving.

- Frequency coverage: 2187.5 to 16804.5 kHz

② DISTRESS SWITCH RECEPTACLE

Connects to the supplied distress switch box.

③ DC POWER CABLE

Connect to a regulated 12–16 V DC power source such as 12 V battery or DC power supply using the supplied DC power cable directly (for U.S.A. version), or using the supplied DC-DC unit box (for Europe version).

Supplied cable's polarity:

- Red: \oplus Black: \ominus

CAUTION : DO NOT connect a 24 V battery even when using the DC-DC unit. This will damage the transceiver.

CAUTION for Europe versions: DO NOT connect directly to a battery for a plus-grounding ship. **ALWAYS** use the supplied DC-DC unit box.

④ GROUND TERMINAL

Connects a ship's ground.

⑤ NMEA CONNECTOR

Connects a GPS receiver (NMEA0183 ver 1.5 or 2.0) for sending positioning data without manual input.

⑥ ACC SOCKET

Connects an Icom MF/HF GMDSS transceiver such as the IC-M710 GMDSS version using the supplied cable.

⑦ PRINTER SOCKET

Connects an IBM centronics or compatible printer to print out received DSC information automatically or manually.

⑧ EXTERNAL SPEAKER RECEPTACLE

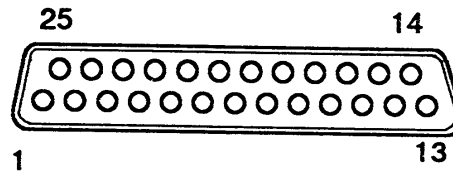
Connects an 8 Ω external speaker with a 1/4 inch monaural plug.

⑨ CLONE RECEPTACLE

For dealer use only.

9 CONNECTION AND INSTALLATIONS

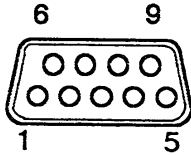
■ Printer socket



Pin No.	Pin name	I/O	Description
1	$\overline{\text{STROBE}}$	Out	Outputs a strobe pulse after data output.
2	DATA1	Out	8-bit parallel data output.
3	DATA2	Out	
4	DATA3	Out	
5	DATA4	Out	
6	DATA5	Out	
7	DATA6	Out	
8	DATA7	Out	
9	DATA8	Out	
10	$\overline{\text{ACKNLG}}$	In	Receives a 'Low' pulse from the printer when the printer can accept more data.
11	BUSY	In	The printer sets this pin to 'High' when it can not accept data, such as when 'off line', etc.
12 15	NC		No connection

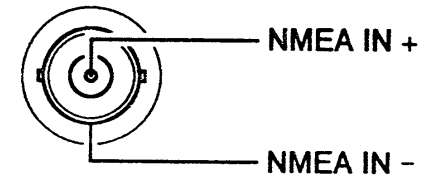
Pin No.	Pin name	I/O	Description
16 17	GND		Connected to ground
18	NC		No connection
19 30	GND		Connected to ground
31	$\overline{\text{INIT}}$	Out	Outputs an initializing signal to the printer just before data output.
32	$\overline{\text{ERROR}}$	In	The printer sets this pin to 'Low' when an error occurs, such as no paper.
33	GND		Connected to ground
34	NC		No connection
35	+5V	In	No connection in the GM-110DSC.
36	NC		No connection

■ ACC socket



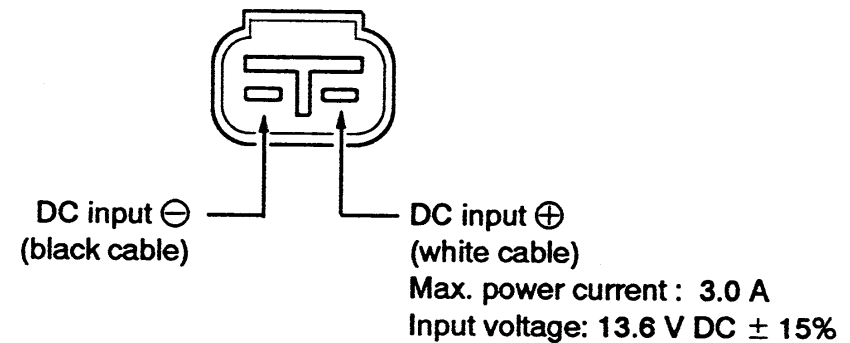
Pin No.	Pin name	Description
1	DMD+	Modulation output to a transceiver Output impedance : 600 Ω Output level : Approx. 800 mV rms
2	DMD-	Coaxial ground for DMD+
3	DAF+	AF input from a transceiver Input impedance : 600 Ω Input level : Approx. 0.25–2.5 Vrms
4	DAF-	Coaxial ground for DAF+
5	NMO+	NMEA data output
6	NMO-	Coaxial ground for NMO+
7	NMI+	NMEA data input
8	NMI-	Coaxial ground for NMI+
9	GND	Ground

■ NMEA in connector



Acceptable version : NMEA 0183 ver 1.5 or 2.0
 Acceptable command : GGA (GPS data; time and position)
 GLL (Loran data; position only)

■ DC power connector



9 CONNECTION AND INSTALLATIONS

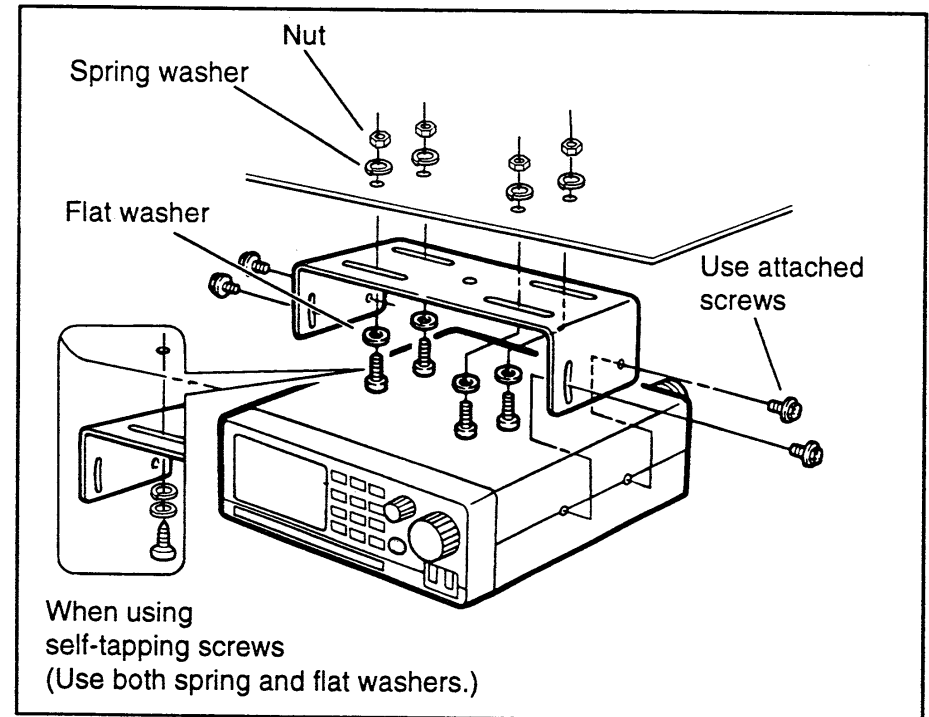
■ Mounting

The universal mounting bracket supplied with your terminal unit allows overhead or dashboard mounting. Please read the following instructions carefully.

- Mount the terminal unit securely with bolts and nuts or it may come loose as a result of wave shocks or vibration.
- Mount the terminal unit so that the face of the terminal unit is at 90 degrees to your line of sight when operating it.

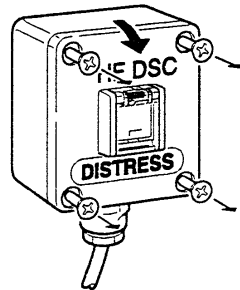
CAUTION: KEEP the terminal unit and external speaker at least 1 meter away from your ship's magnetic navigation compass.

NOTE: Check the installation angle; the function display may not be easy-to-read at some angles.



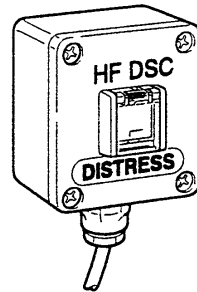
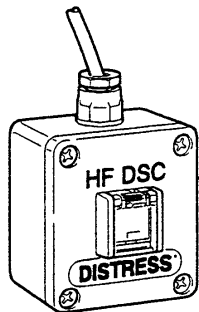
◆ Distress switch box mounting

① Remove the 4 screws from the switch box as shown below.

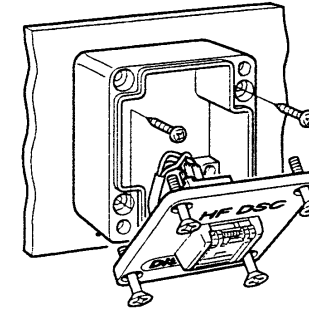


DISTRESS SWITCH BOX

② Place the switch box in the location to be installed.
 • The switch box can be installed in 2 orientations as below.



③ Open the switch box and carefully mark off the 2 spots where the screws/bolts will be fastened.
 ④ Drill holes at those marks, if necessary.
 ⑤ Install the switch box using the screws or bolts.



⑥ Reassemble the switch box with the 4 screws.

■ Supplied accessories

① Mounting bracket	1
② DC power cable (OPC-571)	1
③ Cable for connection w/IC-M710 (OPC-530)	1
④ DC-DC unit (Europe version only)	1
⑤ DC power cable for connection w/DC unit (OPC-616; Europe version only)	1
⑥ Speaker plug (1/4 in. /2-conductor)	1
⑦ Fuse (FGB 3 A)	1
⑧ Self-tapping screws (A0 5 × 20)	4
⑨ Mounting bolts (M5 × 20)	4
⑩ Nuts (M5)	4
⑪ Flat washers (M5)	4
⑫ Spring washers (M5)	4
⑬ Distress switch box	1
⑭ Self-tapping screws (A0 5 × 20)	2

9 CONNECTION AND INSTALLATIONS

■ Antenna connection

The terminal unit has a scanning receiver which can receive 6 distress and safety frequencies. A separate antenna from that of the transceiver is necessary.

Select a well-matched antenna and feedline. A whip or long wire antenna may be available to use with the GM-110DSC.

Required specifications for the antenna

Frequency coverage : 2 to 16 MHz or wider

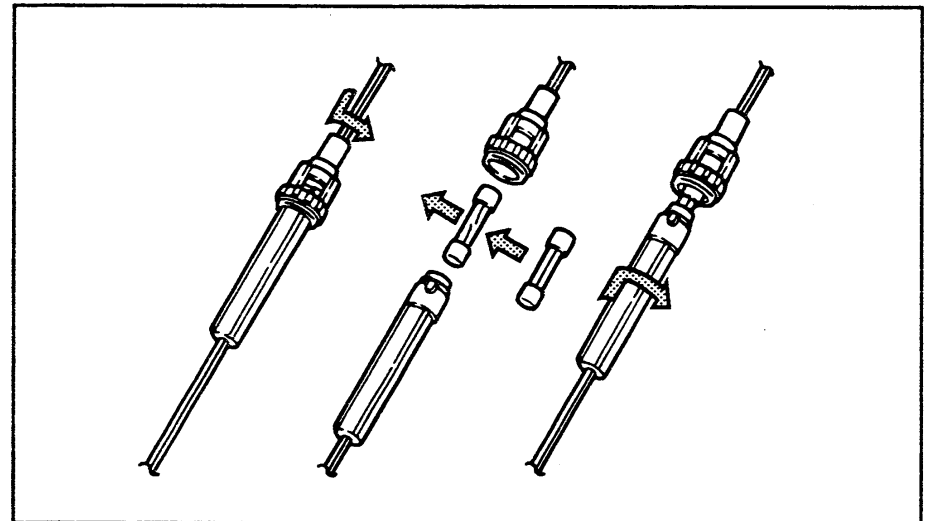
Input impedance : 50 Ω

Connector : PL-259

■ Fuse replacement

Two fuses are installed in the supplied DC power cable. If a fuse blows or the terminal unit stops functioning, track down the source of the problem, if possible, and replace the fuse with a new, rated fuse.

- Fuse rating: FGB 3 A (supplied)



DSC FREQUENCY LIST 10

◇ Emergency frequency

	DSC	Radio telephone	Radio telex
MF	2187.5 kHz	2182.0 kHz	2174.5 kHz
HF4	4207.5 kHz	4125.0 kHz	4177.5 kHz
HF6	6312.0 kHz	6215.0 kHz	6268.0 kHz
HF8	8414.5 kHz	8291.0 kHz	8376.5 kHz
HF12	12577.0 kHz	12290.0 kHz	12520.0 kHz
HF16	16804.5 kHz	16420.0 kHz	16695.0 kHz

◇ Marine frequency band

- 1.6 – 2.9999 MHz
- 4.0 – 4.9999 MHz
- 6.0 – 6.9999 MHz
- 8.0 – 8.9999 MHz
- 12.0 – 13.9999 MHz
- 16.0 – 17.9999 MHz
- 18.0 – 19.9999 MHz
- 22.0 – 22.9999 MHz
- 25.0 – 27.50000 MHz

◇ Call frequency

(Unit: kHz)

	Transmit frequency	Receive frequency		Transmit frequency	Receive frequency
SHIP	2177.0	2177.0	INTER 12-1	12577.5	12657.0
NATIONAL 01	2156.0	1621.0	INTER 12-2	12578.0	12657.5
NATIONAL 02	2156.5	1621.5	INTER 12-3	12578.5	12658.0
NATIONAL 03	2157.0	1622.0	INTER 16-1	16805.0	16903.0
NATIONAL 04	2157.5	1622.5	INTER 16-2	16805.5	16903.5
NATIONAL 05	2158.0	1623.0	INTER 16-3	16806.0	16904.0
NATIONAL 06	2158.5	1623.5	INTER 18-1	18898.5	19703.5
NATIONAL 07	2159.0	1624.0	INTER 18-2	18899.0	19704.0
NATIONAL 08	2159.5	1624.5	INTER 18-3	18899.5	19704.5
INTER 2-1	2189.5	2177.0	INTER 22-1	22374.5	22444.0
INTER 4-1	4208.0	4219.5	INTER 22-2	22375.0	22444.5
INTER 4-2	4208.5	4220.0	INTER 22-3	22375.5	22445.0
INTER 4-3	4209.0	4220.5	INTER 25-1	25208.5	26121.0
INTER 6-1	6312.5	6331.0	INTER 25-2	22509.0	26121.5
INTER 6-2	6313.0	6331.5	INTER 25-3	22509.5	26122.0
INTER 6-3	6313.5	6332.0			
INTER 8-1	8415.0	8436.5			
INTER 8-2	8415.5	8437.0			
INTER 8-3	8416.0	8437.5			

11 SPECIFICATIONS

◇ General

- Antenna impedance : 50 Ω (SO-239)
- Frequency stability : ± 10 Hz
(measured on detected audio frequency)
- Number of memory channels
 - Command memory : 9 channels
 - Frequency memory : 35 channels
 - Address ID memory : 100 channels
- Power supply requirement
 - U.S.A. version : 13.6 V DC (negative ground)
 - Europe version : 13.6 V DC (floating ground)
- Current drain
 - Receive stand-by : 1 A
 - Receive audio max. : 1.5 A
 - At power ON : 3 A (max.)
- Size : 150(W) \times 49.5(H) \times 180(D) mm
5²⁹/₃₂(W) \times 1¹⁵/₁₆(H) \times 7³/₃₂(D) in
- Weight
 - Terminal unit : 1.9 Kg (3.5 lb)
 - DC-DC converter : 1.0 Kg (Europe version only)
- Usable temperature range: -15°C to +60°C (+5 °F to +140°F)

◇ Receiver

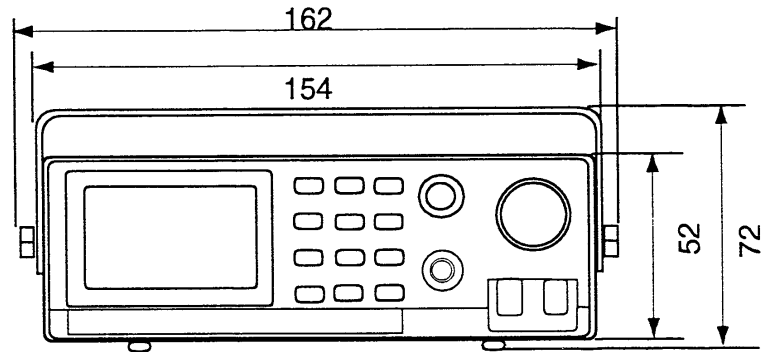
- Receiving mode : J2B
- Sensitivity : 0.5 μ V for symbol error rate $\leq 10^{10^{-2}}$
- Selectivity : Less than ± 500 Hz/-40 dB
- Receive system : Single conversion superheterodyne
- IF frequency : 9.0106 MHz
- Spurious rejection : More than 70 dB
- Image rejection : More than 70 dB
- Audio output power : More than 1.5 W at 10% distortion with an 8 Ω load.
- Audio output impedance : 8 Ω (1/4" 2-conductor socket)

◇ External connection

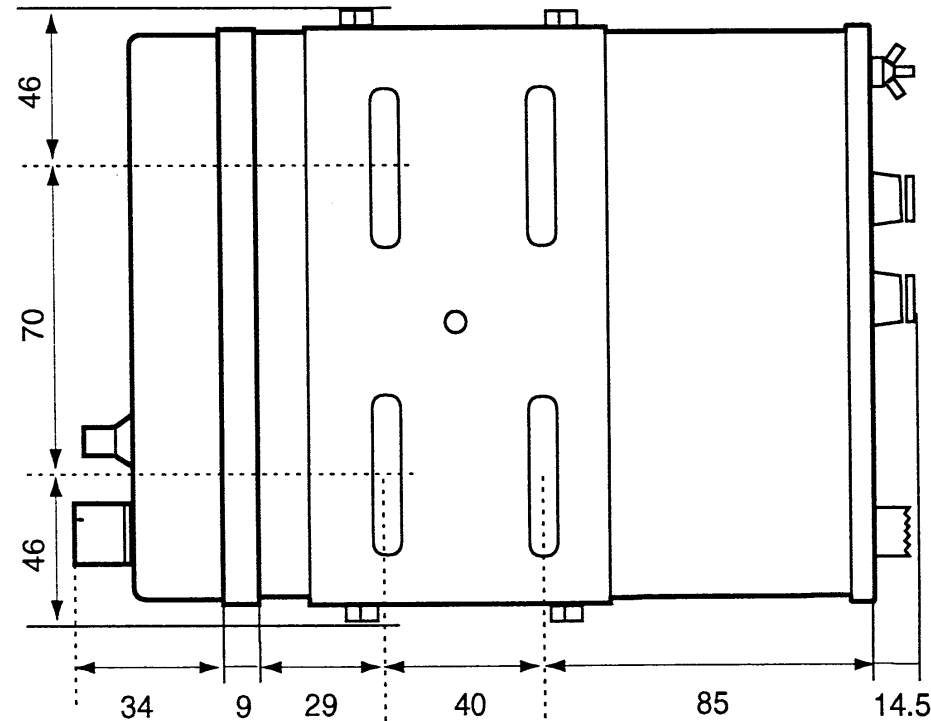
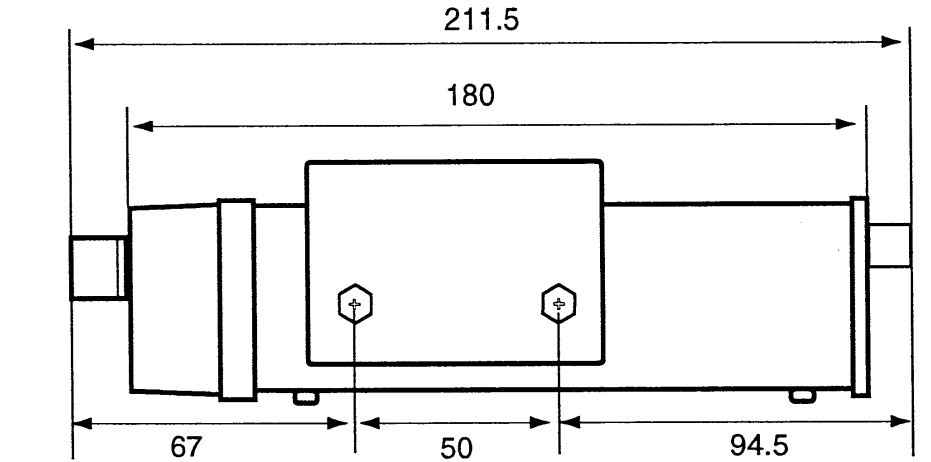
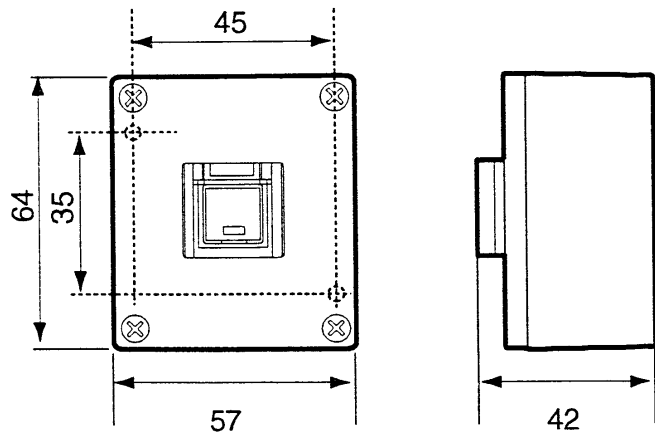
- Acceptable NMEA data: NMEA 0183 ver 1.5 or 2.0
(command GGA and GLL)
- Printer : IBM® Centronics

DIMENSIONS 12

GM-110DSC



Distress switch box



Count on us!

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