LOWRANCE

VHF DSC RADIO

MODEL LVR-850

OWNER'S
QUICK GUIDE

Pony Electric Corporation

October 28, 2004

FCC RF EXPOSURE COMPLIANCE REQUIREMENTS

When operating your marine radio transceiver, you should know that the antenna radiates radio frequency energy. This radio was designed to meet the FCC's rules and regulations for the maximum permissible exposure to radio frequency energy. This design was tested and found to be compliant to the strict requirements established by the FCC.

DO NOT operate the radio without a proper antenna attached, as this may damage the radio and may also cause you to exceed FCC RF exposure limits. A proper antenna is the antenna supplied with this radio by the manufacturer or an antenna specifically authorized by the manufacturer to use with this radio.
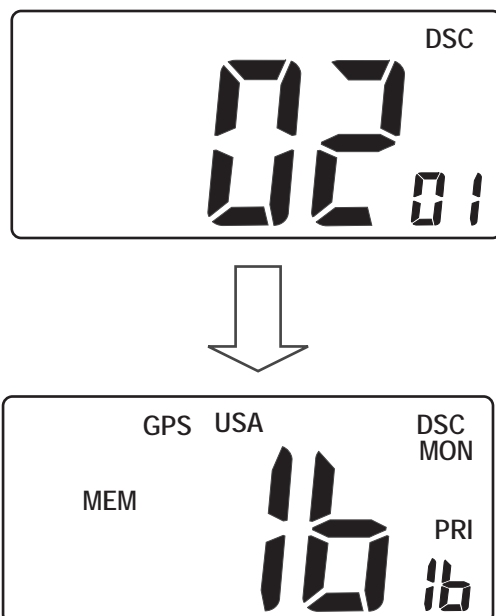
DO NOT transmit for more than 50% of the total radio use time. Transmitting more than 50% of the time can cause FCC RF exposure compliance requirements to be exceeded. The radio is transmitting when the "TX indicator" is displayed on the screen. You can cause the radio to transmit by pressing the "PTT" switch.

IMPORTANT: The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 91 cm (37 inches) from all persons (including passengers) and must not exceed an antenna gain of 3 dBi and must not be co-located or operating in conjunction with any other antenna or transmitter.
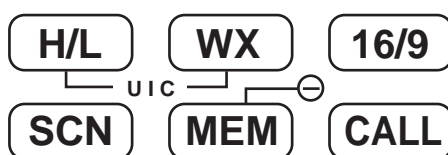
BASIC RADIO OPERATIONS :

TURN ON :

Turn **VOL**ume knob CW past the "click" position. LCD comes ON & the LCD screen shows with the DSC software version number displayed for -1 second. The Priority channel is the default channel selected (CH16 or 09) and is displayed in the LCD. For the first time Turn On, CH16 is used. The radio's lighting is always ON. There is no contrast control.

SQUELCH Adjust :

Turn the SQuelch knob CCW until noise is heard. Turn the SQuelch knob CW about 1/8 turn until noise stops.

KEYPAD Usage :

```
 H/L     WX     16/9
     └─ U I C ─┘   ┌─○
 SCN    MEM    CALL
```
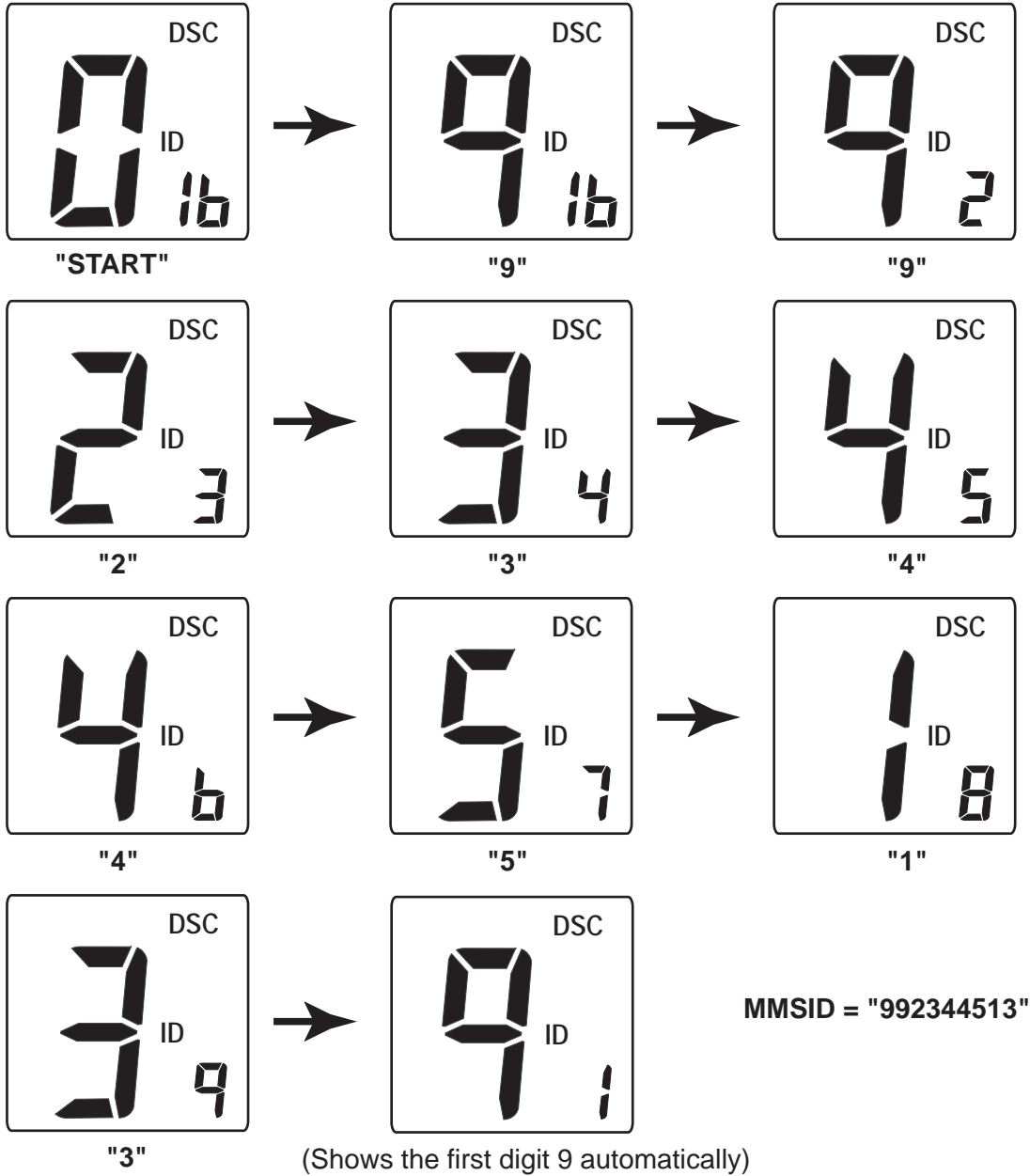
A friendly tone is emitted when any of the 8 keys are pressed. A 3-beep error tone is emitted if the key press is not allowed. Some functions require a holding down of a key. A single beep is emitted, then after the hold down timeout, a second friendly beep will be heard and the mode entered. See the example under Priority Channel Set below.

MMSID Set :

Your MMSID number is like your home phone number. Other DSC rdios must enter your number before they can call you. Likewise, you must enable your radio to recognize your own MMSID. You only have 1 chance to enter the MMSID into your radio. Please study this section and do it properly.

In case that the MMSID number is not set up, "ID" annunciator on the main screen will blink.

If a 9-digit MMSID number has not been set into the radio, no DSC calls are allowed.
To enter your assigned MMSID number, follow these steps. There is only 1 chance
to do this procedure correctly.

****

DSC **0** ID **16**	DSC **9** ID **16**	DSC **9** ID **2**
"**START**"	"**9**"	"**9**"
DSC **2** ID **3**	DSC **3** ID **4**	DSC **4** ID **5**
"**2**"	"**3**"	"**4**"
DSC **4** ID **6**	DSC **5** ID **7**	DSC **1** ID **8**
"**4**"	"**5**"	"**1**"
DSC **3** ID **9**	DSC **9** ID **1**	**MMSID = "992344513"**
"**3**"	(Shows the first digit 9 automatically)	

- **Hold Down** the CALL key for 5 seconds. The "**ID**" annunciator will blink during the entry period
  and the number "0" is in the Big Digit and the number "**16**" is in the small digit. If a valid MMSID
  is already entered & stored into the radio's memory, changed to ON/OFF switching of DSC
  Monitor and a new MMSID entry is inhibited.

- The Big Digit is the MMSID number that you are setting and the small digit is the MMSID's
  charactor field position. For example - "**2**" in the small digit represents the 2nd number from
  the left in your assigned MMSID, a "**4**" is the 4th number from the left, etc.

- Press the **UP/DWN** key to set proper MMSID data. After correct verification of **EACH** MMSID
  number by you, touch the MEM key to advance. The small digit now displays the 2nd charactor
  position with a "0" in the Big Digit and "2" in the Small Digit. Press the **UP/DWN** key to set the

second MMSID digit and touch the MEM key to store. Repeat the operation until all 9 digits have been entered and verified by you. By pressing the **MEM** key, all 9 digits will flash across the screen for your review.

● There is no backup or edit mode. If there is an error in the entery procedure, press the 16/9 Key to edit this procedure or simply turn the radio OFF. No MMSID number will be stored. After you are completely satisfied with your entered MMSID number, **Hold Down** the CALL key for 5 seconds to store the number. The "**ID**" annuciators now stop blinking & the radio reverts to the MAIN screen. DSC call can now be made.

SELECT Channels :

Use the UP/DWN key to select the channel. Refer to the enclosed channel chart for proper usage and understanding. In USA & Canada, the Wx channels are available. Wx channels are not available for the International Channel Bank.

The "A" annunciator in the Radio's LCD indicates an "ALTERNATE" Channel usage and usually indicates a SIMPLEX channel is tuned and normal voice ship-to-ship communication is appropriate. If the "A" annunciator is OFF, the radio is sometimes operating in the DUPLEX Mode - the Transmit and Receive frequencies are different.
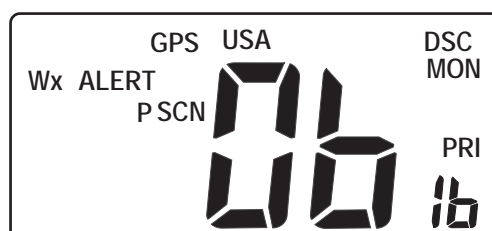
CHANNEL Bank :

Press and hold the HI/LO key & Wx key at the same time to switch channel banks - USA, Int'l, & Canada. Refer to the channel chart appendix for proper usage. The selected **"USA", "INT" or "CNA"** annunciator will come ON.
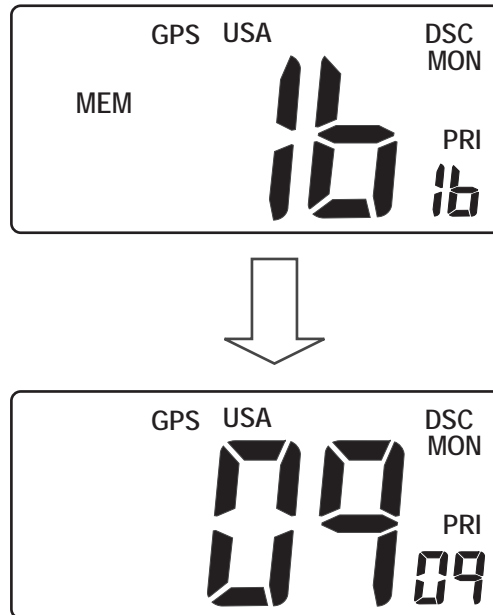
Wx and Wx Alert :

This key is used to enter the Wx mode. The last used Wx channel always appears first. Use the UP/DWN key to change the Wx channel. In Priority Scan or Memory Scan Modes, a press of the Wx key allows the Wx Alert function to be toggled ON/OFF. The scanning temporality stops & the "Wx ALERT" annunciator will blink twice before the scan continues. This reminds the user the settings of the Wx Alert function. Select the Wx channel before starting Priority Scan or Memory Scan.

The Wx Alert is a 1050Hz tone burst that is transmitted from the NOAA Weather station. A special circuit in the radio detects this tone & during scanning modes (except ALL SCAN) a loud 2-tone warning (like a fire truck!) will sound if hazardous weather is coming your way. The alarm is cancelled by pressing any key. The radio then halts scanning & switches over to the Wx channel to hear the warnings. You know the radio is scanning the Wx channel, if you see the "Wx" annunciator flash ON/OFF is the LCD during the scanning process. If you look closely, while the "Wx" annunciator comes ON quickly and you can briefly see the last Wx channel is the big digit channel display.

PRIORITY CHANNEL SET and 16/9 Operations :

The Priority channel can be set as CH16 or CH09. **Hold Down** the Red 16/9 key about 2 seconds until the priority channel switches to the new setting. This is a toggling action. The new priority channel is remembered in EEPROM memory. There is no battery in the radio.
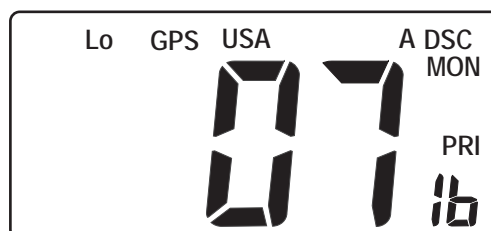
A quick press of the 16/9 key immediately selects the priority channel (16 or 09) with HIGH Tx power. Another press selects "last used" channel. This action does not over-ride the HI/LO power function, except for the priority channel itself.

PTT :

This Key is on the MIKE. **PRESS AND HOLD** it down to activate RF radio transmission at the selected RF power level. There is a 5-minute maximum Tx timer, per FCC regulations.
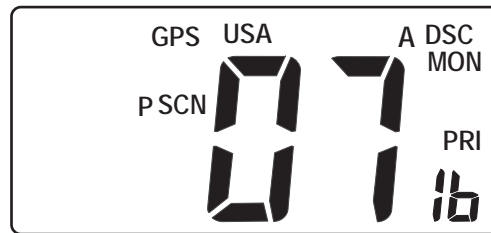
HI/LO :

This key toggles between 25W and 1W. Some channels that do not allow Tx or are set to 1W will sound the 3-tone error beep if the HI/LO key is pressed. If the "**Lo**" annuncitor is OFF, the radio will transmit at 25 Watts of RF Power.
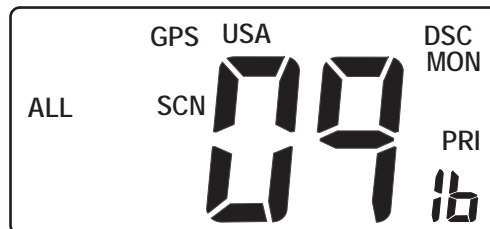
PRIORITY Scan :

Pressing the SCAN key activates the PRIORITY SCAN mode. "P SCAN" appears in the LCD display. The priority channel is scanned every 2 seconds, even though the currently received channel has a squelch Break. When input a signal to the priority channel, the mode stops to

the priority channel and starts receiving operation until the signal of priority channel stops. Wx alert is ON and can be toggled OFF/ON by pressing the Wx key. You see the 3 channels quickly rotate through the big digit display looking for a squelch break.

```
      GPS  USA        A DSC
                        MON
  P SCN   [07]
                        PRI
         [U]        Ib
```
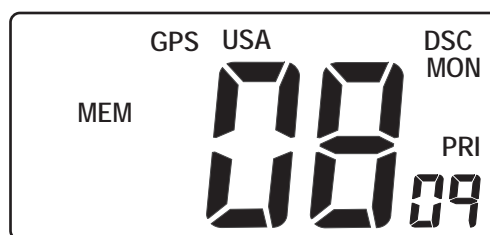
ALL Scan :

Press/hold the SCAN key to scan all available channels. "**ALL SCAN**" appears in the LCD display. A noisy channel that always stops the scanning can be temporarily eliminated from the all scan list by holding down the MEM key. The ⊝ symbol under the MEM key on the radio front panel means DELETE. A channel received the signal will stop and starts further signal receiving mode. The channel will not be changed until the input signal stops.

```
        GPS  USA        DSC
                         MON
  ALL   SCN  [09]
                         PRI
            [U]      Ib
```
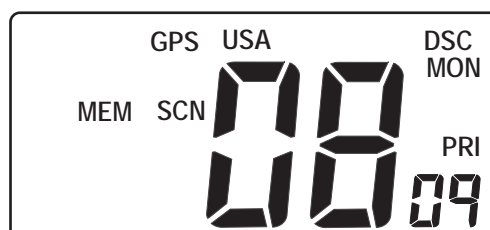
The noisy channel is now removed and the 7-channels/second scanning of all channels can continue. Turning the radio OFF/ON again restores all the channels back to original condition. There is no memory of deleted channels.

MEMORY CHANNEL OPERATION and Scanning :

In normal operation, the "**MEM**" annunciator appears in the LCD to alert the user that the displayed channel is stored in the Memory Channel List. In the figure below, CH08 is in the Memory Channel List.

```
        GPS  USA        DSC
                         MON
  MEM        [08]
                         PRI
            [U]      09
```

Press the **MEM** key, then the **SCAN** key to start scanning the list. Scanning starts with Wx Alert ON. The Priority Channel is automatically stored in the scan list and does not need to be entered. While in the scan mode, touch the Wx key to toggle the Wx Alert function ON/OFF. A channel received the signal will stop and starts further signal receiving mode. The channel will not be changed until the input signal stops.

```
        GPS  USA        DSC
                         MON
  MEM  SCN   [08]
                         PRI
            [U]      09
```

To cancel scanning press the SCAN key again or the 16/9 key. PTT exits the scan mode at the last channel display.

You can easily add/delete channels from the list of the normal MAIN screen. The priority channel cannot be erased. To add a new channel, use the UP/DOWN key to the desired channel (shown on the big digits). If the Channel is currently stored as a Memory channel, the "**MEM**" annunciator is ON.

To add a new channel to the list, **Hold Down** the MEM key until the "**MEM**" annunciator appears. The new channel is new added to the list. To delete a channel in the list, turn the selector to choose a channel number shown in the list & Hold Down the MEM key. This channel is now deleted and the "MEM" annunciator is gone.
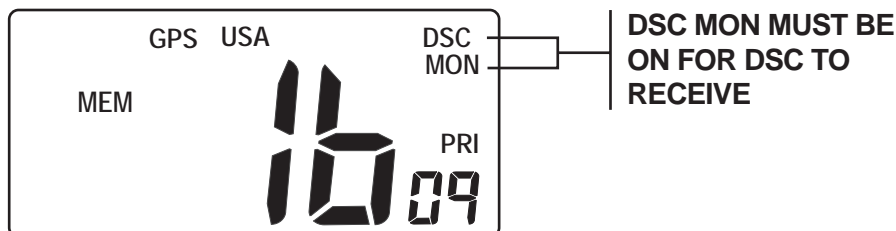
To clear and reset all the MEMORY channels, hold down the MEM key while turning ON the radio. This clears out the memory channels (except the Priority Channel) from EEPROM memory.

DSC OERATION

PROCEDURES :

DSC Monitor :

Be sure the DSC Monitor mode is ON. Hold Down the CALL Key for about 4 seconds to toggle the DSC Monitor Mode ON/OFF in case that the MMSID has been stored. The "DSC MON" annunciator will be ON in the LCD if CH70 is being accessed. Since there is no independent CH70 receiver, the radio normally monitors CH70 and checks other channels on a regular basis to detect a Squelch Break. This control method assures the radio will acquire the most DSC call possible.

GPS   USA   DSC
                             MON   **DSC MON MUST BE ON FOR DSC TO RECEIVE**
MEM
                             PRI

Under normal conditions, you will not even notice this CH70 monitoring activity, except that all scanning modes will be somewhat slower. If you wish "fastest possible channel scanning", just turn the DSC Monitor Off. DSC operation is OFF and the radio will not receive any calls. DSC is disabled.
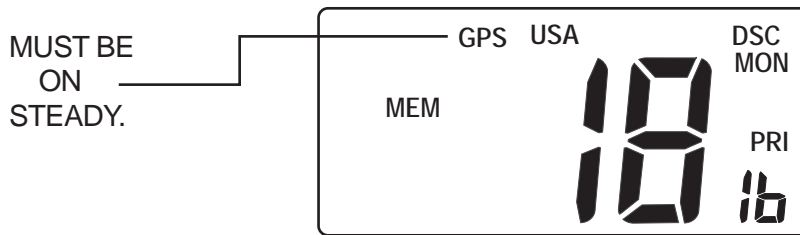
*************************************** SPECIAL NOTE ***
DSC calls will NOT be received when the radio is receiving on a working
Channel or during Transmit time. During Scanning modes, CH70 is monitored
on an allocated time-slot basis and most DSC calls will be received.
****
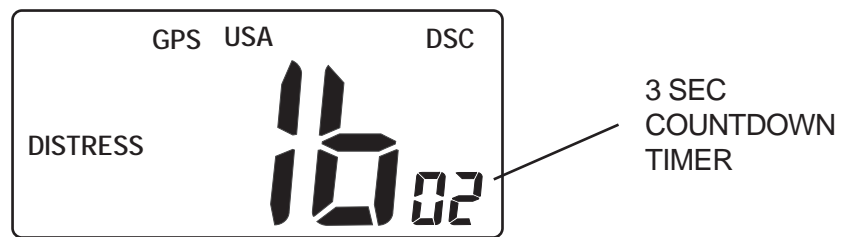
GPS Operation :

Be 100% sure that your GPS is turned ON and is Operational at all times - check that the satellites are in view and a LL position has been acquired. This is TOP IMPORTANT for proper DSC Distress Call operation. This acquired GPS data is sent over CH70 to the Coast Guard and their primary starting point of any search & rescue mission to help you.

Be sure the "GPS" annunciator is ON steady and not blinking. If blinking, the GPS data is not valid. The situation must be correct.

MUST BE
ON
STEADY.

GPS USA   DSC
                  MON
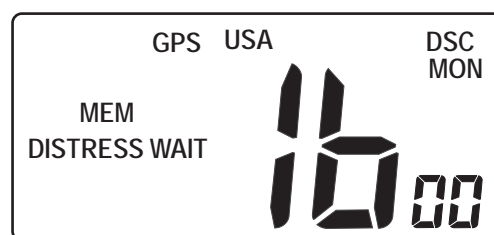
MEM

18
PRI
16

TRANSMITTING A DISTRESS CALL :

Lift the red cover on the front panel to make a DISTRESS call to the Coast Guard. Press and Hold the DISTRESS Key down for at least 3 seconds. A countdown timer is displayed on the LCD and a one second beeper activates. The Channel automatically goes to CH16. To temporarily stop the call, let go of the DISTRESS Key. No message has been sent until the countdown timer goes to zero seconds. Press the 16/9 key to cancel.

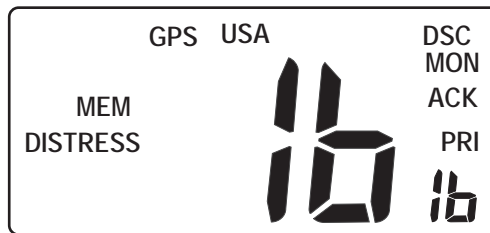GPS USA   DSC

DISTRESS

16 02

3 SEC
COUNTDOWN
TIMER

If the DISTRESS key is held down until the timer expires (0 seconds), the DSC DISTRESS message is transmitted at 25 watts. The radio switches to channel 70 & Tx will come on for about 1-2 seconds. The DSC message is transmitted 5 times without a break. This message contains your MMSID, LL position and UTC time acuired from your GPS navigator. The "DISTRESS" annunciator is displayed during the transmission.

TX   GPS USA   DSC

DSC DISTRESS
MESSAGE
BEING SENT

DISTRESS

70 00

TIMEOUT
EXPIRED

A loud 2-tone alarm sounds. This alarm cannot be stopped unless the mode is cancelled. Pressing the 16/9 or PTT key cancels the DISTRESS WAITING mode. With no mode cancellation, the radio transmits the DISTRESS message again in 3.5 to 4.5 minutes. A "WAIT . . " message is displayed.

GPS USA   DSC
                  MON

MEM
DISTRESS WAIT

16 00

The Coast Guard is the only agency allowed to ACKNOWLEDGE (ACK) a DISTRESS call. An Individual vessel's DSC radio will not respond automatically with an ACK. When an ACK is received, the radio distress mode is automatically cancelled & voice communication is on CH16.
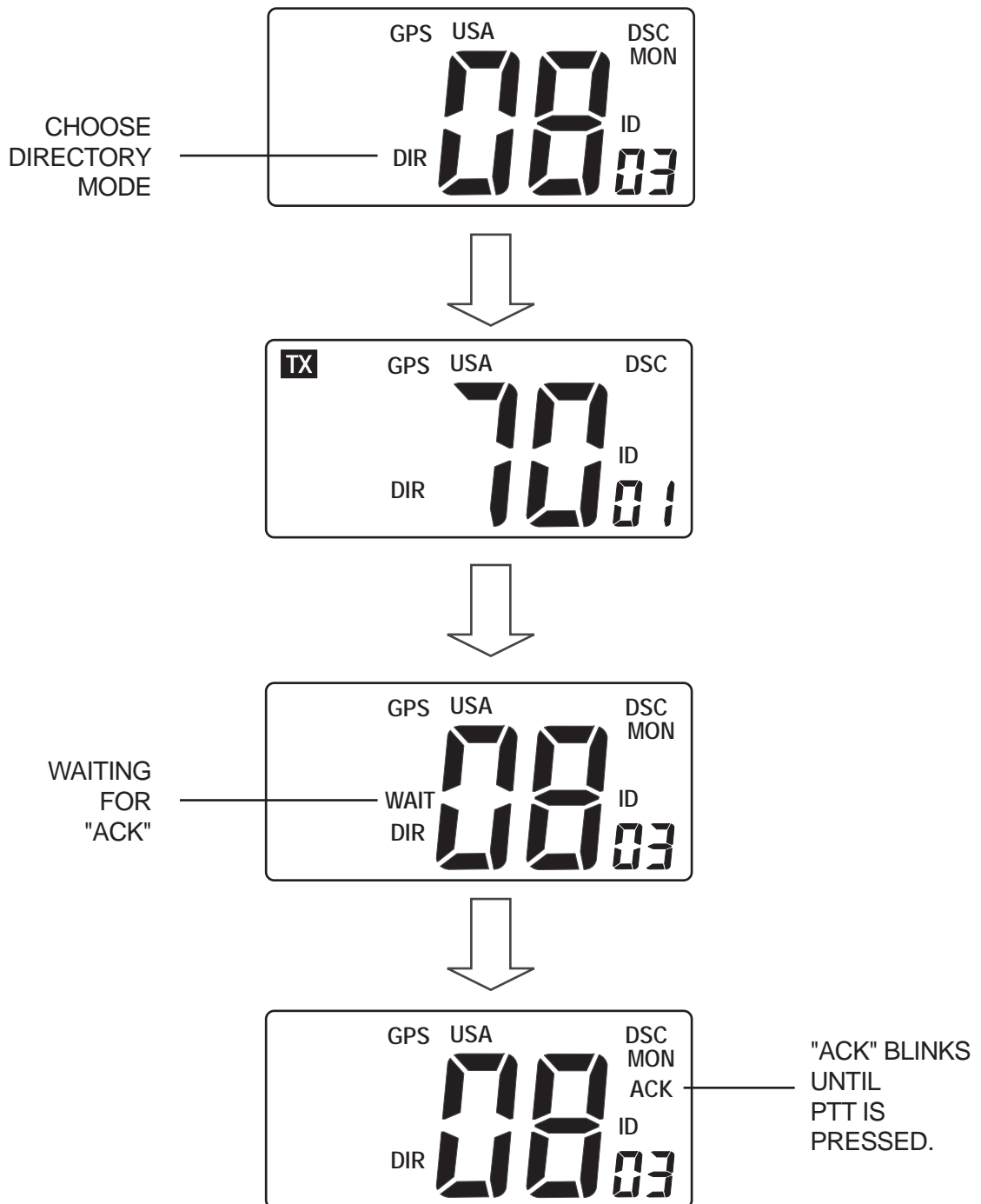

THE DIRECTORY

PLACING AN INDIVIDUAL CALL from the Stored Directory List :

The Directory is an organized stored list of all your friend's MMSID numbers (up to 10) that you have entered into the DSC Calling Directory. You can quickly send a DSC CALL by using this sequence :

- Use the UP/DWN keys to select the Simplex working channel.

- Press the CALL key once.

- Press the UP/DWN key to select the DIRECTORY CALLTYPE "DIR". ("LAST, DIR., NEW, ALLSHIP'S" are the other selections). "DIR." is displayed as the default on Power On.

- Press the UP/DWN key to choose a MMSID location number (01-10). The default number is the MMSID of the last used call.

- Press the CALL key to transmit. The called radio will acknowledge (ACK back) and the communication link is established.

All Individual Calls are categorized as ROUTINE call types and a friendly ringing tone sounds. When the "ACK" annunciator turns ON, at the caller's radio the calling channel has been tuned for voice link establishment. Simply press PTT to talk to your party.
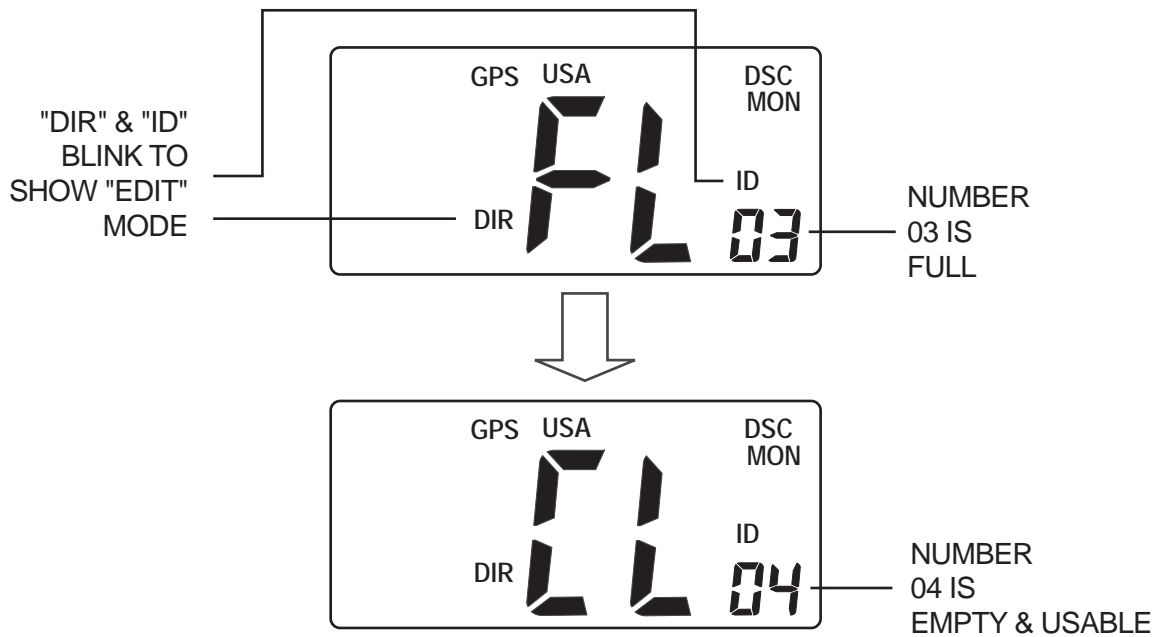
In the example screen below, working Channel 08 was selected to call the vessel MMSID stored in Directory Location #3.

CHOOSE
DIRECTORY
MODE

GPS USA DSC MON
DIR ID
08 03

GPS USA DSC
TX
DIR ID
70 01

WAITING
FOR
"ACK"

GPS USA DSC MON
WAIT
DIR ID
08 03

GPS USA DSC MON
ACK
DIR ID
08 03

"ACK" BLINKS
UNTIL
PTT IS
PRESSED.

STORING/EDITING LOCATION Numbers and MMSID Data in your Directory :

To store a new MMSID in an unused number location, proceed with the following steps :

- Press the CALL key to display "LAST", then, select the "DIR" by pressing UP key. "DIR" annunciator blinks.

- Press the CALL key. The "ID" annunciator starts to blink ON/OFF at a 1/sec. This indicates the Directory EDIT mode is activated.

"DIR" & "ID" BLINK TO SHOW "EDIT" MODE

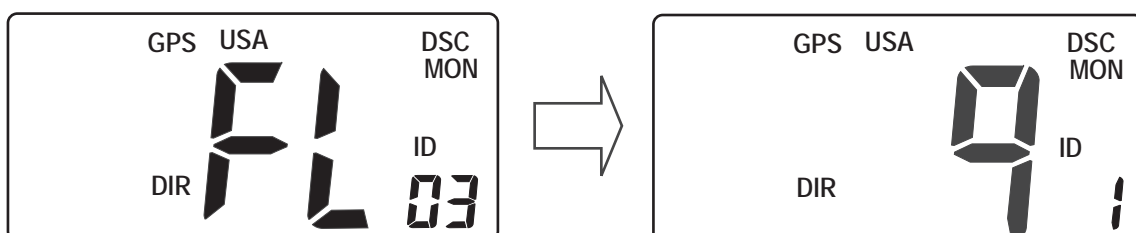NUMBER 03 IS FULL

NUMBER 04 IS EMPTY & USABLE

- Press the UP/DWN key to select an unused location number. If the number location is full, "FL" appears in the Big Digits. If the number is empty and available to use, "CL" appears in the Big Digit display.
- Select the location number of "CL" and press the MEM key to get the MMSID number input screen.
- Press the UP/DWN key to set proper MMSID data for the digit shown. After correct verificatin of EACH MMSID number by you, touch the MEM key to advance. The small digit now displays the 2nd charactor position with a "0" in the Big Digit and "2" in the Small Digit. Press the UP/DWN key to set the second MMSID digit and touch the MEM key to store. Repeat the operation until all 9 digits have been entered and verified by you. Confirm all 9 digits by pressing the MEM key for your review. There is no backup or edit mode. If there is a mistake, press the 16/9 key to Exit this procedure or simply turn the radio OFF. No new MMSID number will be stored at this location.. After you are completely satisfied with the new MMSID number, Hold Down the CALL key for 2 seconds to store the number. The "ID" annunciator blinks and reverts to next MMSID number input screen.
- Press the 16/9 key to revert to the main screen.
- Write down in your Vessel LOG, the Person's Name, Number Loction, MMSID Data, and Comments for future reference.

The example below shows the MMSID Data 987776510 being entered at number location #04.
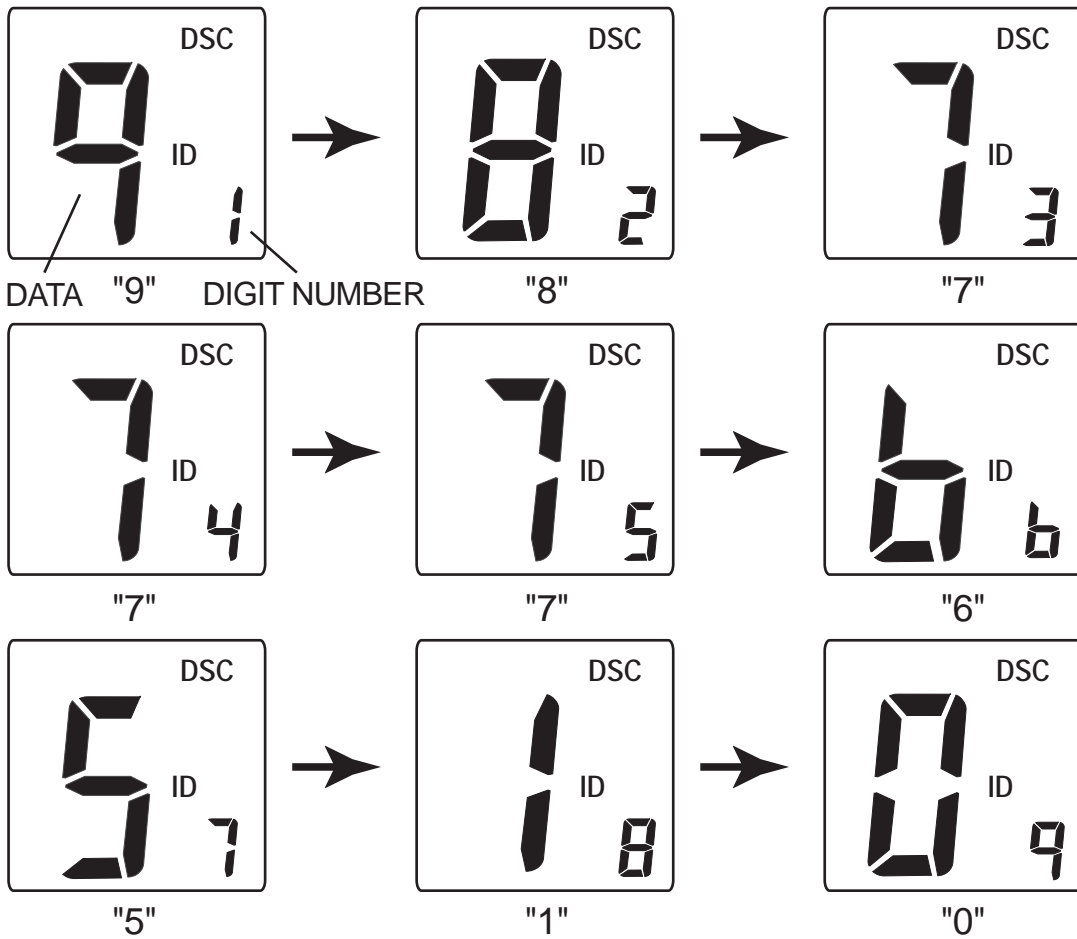
To change or edit MMSID data, select the location that says full ("FL") and press the MEM key to change the data.

In case of changing (over-writing) the DIR. MMSID :
After finishing of inputting the 9 digit MMSID, hold down the CALL key for 5 seconds to enter the new MMSID.
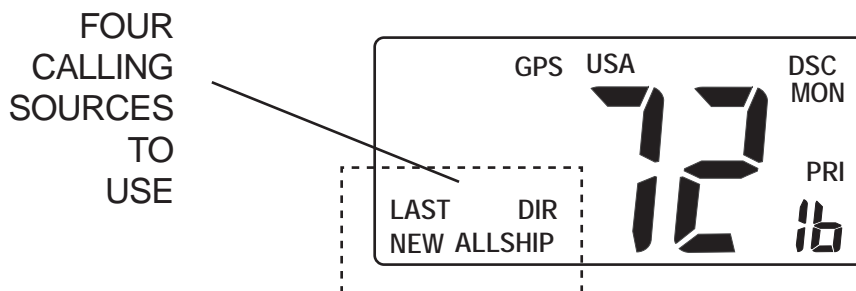
NEW MMSID FOR LOCATION #04 = 987776510

DATA "9"   DIGIT NUMBER   "8"   "7"

"7"   "7"   "6"

"5"   "1"   "0"

TRANSMITTING DSC CALLS

CALLING Modes :

Pressing the CALL key allows immediate access to four sources of calls.

- LAST all - calls back the last incoming DSC call with a ROUTINE Individual Call.

- DIRECTORY List - Selects any of 10 previously stored MMSID numbers to call.

- NEW Call - allows easy entering of a call to new caller not in the Directory.

- ALLSHIP'S Call - allowes placement of a ROUTINE DSC call to any ship.

Press the UP/DWN key to scroll through the four choices. The "last used" choice always appears first.
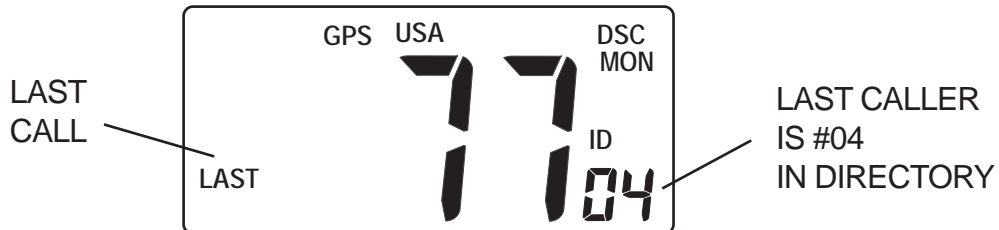
FOUR
CALLING
SOURCES
TO
USE

TRANSMITTING "LAST" Call :

There is no stored CAll Log Memory in the radio. Only the LAST received call can be called back with an Individual Ship's ROUTINE call.

You can quickly send a LAST CALL by using this sequence :

- Press the UP/DWN key to select the Simplex working channel. Be sure you are on a good working channel. The radio will default to 16 if a duplex was selected. (If pressed CALL key during Wx channel mode, the last used channel source appears.)
- Press the CALL key.
- "LAST" blinks.

LAST CALL — LAST

GPS USA | **77** DSC MON | ID 04

LAST CALLER IS #04 IN DIRECTORY
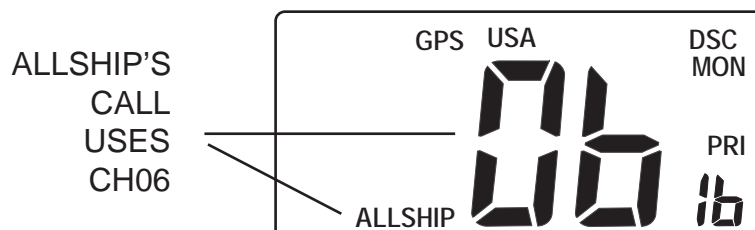
- Press the CALL key to transmit.

If there is no LAST call information stored, the transmission is blocked and error beep emitted. If the LAST call is a MMSID number stored in your DIRECTORY, the "ID" annunciator will come ON with the proper number displayed. You will remember this ID as a vessel you know from the LOG you manually wrote down. The called radio will acknowledge (ACK back) and the voice communication link is established as soon as you press PTT.

TRANSMITTING "DIRECTORY" Call :

See "PLACING AN INDIVIDUAL CALL From the Directory List" - covered above.

TRANSMITTING "ALLSHIP'S" Call :

This procedure allows you to place a ROUTINE All Ship's Call, sounds a friendly ringing tone & the Simplex calling CH06 is AUTOMATICALLY selected for link establishment. ALL SHIP'S URGENCY or SAFETY DSC Calls are not supported in this radio.

ALLSHIP'S CALL USES CH06 — ALLSHIP
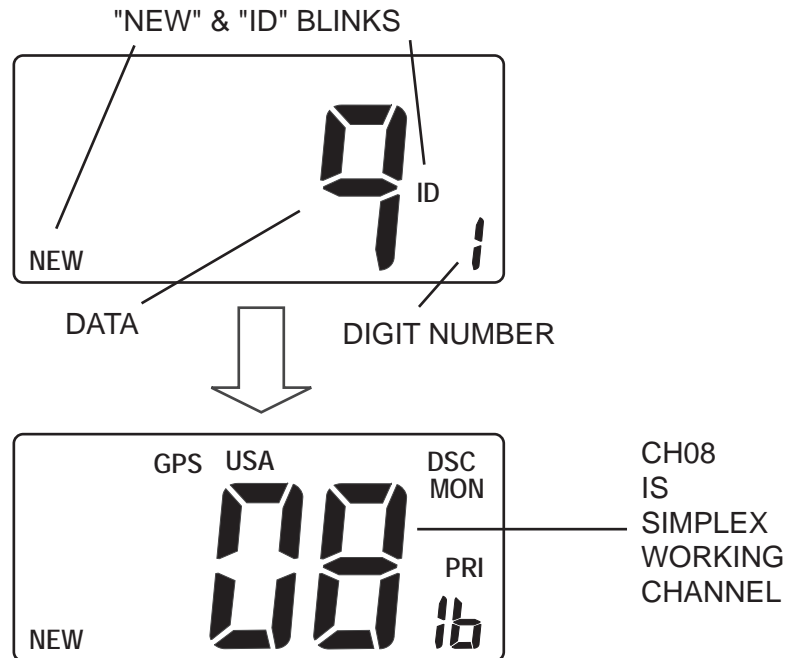
GPS USA | **06** DSC MON | PRI 16

- Press the UP/DWN key to select the Simplex working channel. Be sure you are on a good working channel. The radio will default to 16 if a duplex was selected. (If pressed CALL key during Wx channel mode, the last used channel appears.)
- Press the CALL key.
- "ALLSHIP" blinks.
- Press the CALL key to transmit.

TRANSMITTING "NEW" Individual Call :

This procedure allows you to place a New ROUTINE Individual Ship's Call with the Simplex calling CH08 AUTOMATICALLY selected for Voice Communication Link establishment. You may change CH08 to another Simplex channel before calling, if you wish.

- Press the CALL key once. "LAST" blinks.

- Turn the selector to choose the "**NEW**" Call.

- Press the CALL Key again. You can now enter the new MMSID data at the selected location number in the same manner you entered as a Directory listing.

*********************************** SPECIAL NOTE ***
NEW call MMSID Numbers are not stored. They are for temporary use. You must re-enter them again in your Directory to be stored permanently.
****

"NEW" & "ID" BLINKS

NEW

DATA   DIGIT NUMBER

GPS USA   DSC
                 MON
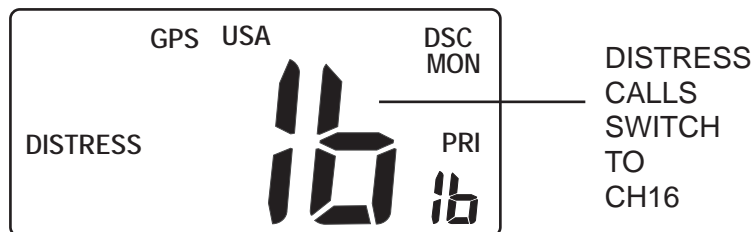   PRI
NEW

CH08
IS
SIMPLEX
WORKING
CHANNEL

- Press the UP/DWN key to set proper MMSID data for the digit shown. After correct verification of EACH MMSID number by you, touch the MEM key to advance. The small digit now displays the 2nd character position with a "0" in the Big digit and "2" in the Small Digit. Set the second MMSID digit using UP/DWN key and touch the MEM key to store. Repeat the operation until all 9 digits have been entered and verified by you. At that time all 9 digits will flash across the screen for your review. There is no backup or edit mode. If there is a mistake, press the 16/9 key to Exit this procedure. After you are completely satisfied with the new MMSID number, press the CALL key.

- Use the UP/DWN key to select the Simplex working channel if you want to change from H08. Be sure you are on a valid Simplex working channel before transmitting. The radio will default to 16 if a duplex was selected.

- Press CALL key to transmit. (If pressed CALL key during Wx channel mode, the last used channel appears.)

RECEIVING DSC CALLS

RECEIIVING "DISTRESS" Call :

A reception of a DISTRESS Call automatically establishes a Voice Communication Link on CH16.
There is no way to display the vessel's LL position or time of call. This data must be gotten by
voice communications with the Vessel in Distress. Press the 16/9 Key to cancel the loud alarm.
If you wish to contact the Vessel in Distress, press the DISTRESS button opening the red cover
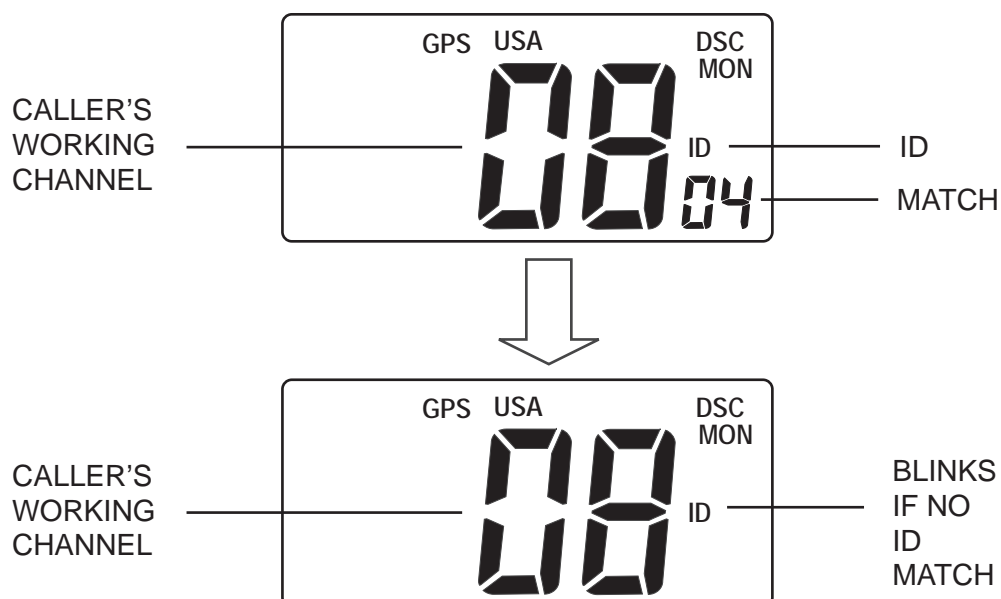of the front panel.

LVR-850 does not respond to two types of DSC Distress call types.

- Distress Relay from an intermediary vessel.

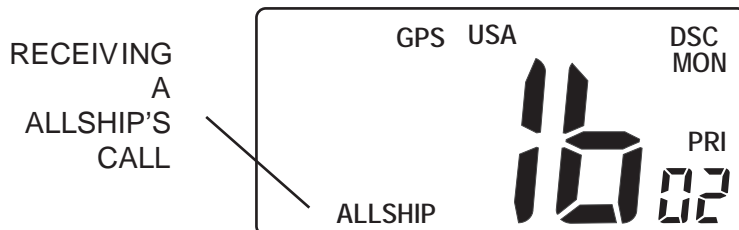- Distress Relay ACK message from a COAST Station.

RECEIVING "INDIVIDUAL" Call :

A reception of INDIVIDUAL Call automatically establishes a Voice Communication Link on the
working channel requested by the calling radio. Your radio atutomatically transmits an ACK
message back to the calling radio. If the calling's vessel MMSID matches your stored Directory
entry, the Number Location is shwon. Look into your written LOG to see who called or remember
the vessel's Number Location yourself. There are only 10 to remember. If no match is possible,
the "ID" annunciator blinks. Press the 16/9 key to cancel the friendly ringing alarm. If you wish
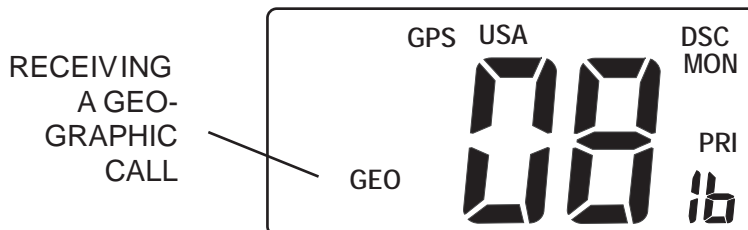to contact the calling Vessel, just press the PTT button on the Mike.

RECEIVING "ALLSHIP'S" Call :

When receiving any type All Ship's call (ROUTINE, URGENT, or SAFETY), an urgent ringing tone sounds & the calling radio's requested working channel is selected for Voice Communication Link establishment. There is no ACK back required from your radio. If you wish to contact the calling Vessel, just press the PTT button on the mike.

RECEIVING
A
ALLSHIP'S
CALL

GPS   USA   DSC
                             MON

                             PRI

ALLSHIP   *16*   *02*

RECEIVING "GEOGRAPHIC" Call :

The LVR-850 is able to receive a geographic call as specified in DSC Technical Protocol Specification SC-101. A friendly ringing tone sounds & the calling radio's requested working channel is selected for Voice Communication Link establishment. There is no ACK back required from your radio. If the calling's vessel MMSID matches your stored Directory entry, the Number Location is shown. If you wish to contact the calling vessel, just press the PTT button on the mike.

RECEIVING
A GEO-
GRAPHIC
CALL

GPS   USA   DSC
                             MON

                             PRI

GEO   *08*   *16*

SET-UPS

FACTORY DEFAULT Settings :

This is confidential information not to be in the Owner's Manual. Hold down both the MEM and the SCAN key. Then turn on the radio. The following factory default settings now appear.

Last Call Log. :   Cleared
MMSID :   Cleared
Directory :   Cleared
Priority Channel :   16
Wx Channel :   01
Wx Alert :   ON
DSC Monitor :   ON
Channel Bank :   USA