

SEA 245

Digital Single Sideband Radiotelephone



Operator's Manual

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SEA
7030 220th St. S.W.
Mountlake Terrace, WA 98043
USA

(425) 771-2182
FAX: (425) 771-2650
www.seacomcorp.com

PN: OPR-245
Rev. 3A
Date: 02/2013

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TECHNICAL SPECIFICATIONS

DIMENSIONS:

3.9" H x 10.5" W x 10.9" D

99mm H x 265mm W x 278mm D

WEIGHT:

10 Lbs.

4.5 Kgs.

ELECTRICAL:

Type Acceptance	FCC Parts 15, 80, 87, 90 GMDSS (Para 80.1101) IEC 61097-3,8,9 ETS 300 338, ETS 300 373
FCC Identifier	BZ6SEA245
Frequency Range	(TX) 1.605 – 29.999 MHz (RX) .490 – 29.999 MHz
Operating Temperature	-30 degrees to +60 degrees C
Frequency Stability	± 10 Hz
Emission	2K80H3E, 2K80J3E, 2K80R3E, 280HF2B, 280HA1A
Primary Voltage	245 13.6 VDC +15%, -15% 245-24 24 VDC +30%, -10% (Floating Chassis)
Current Drain	245 245-24
	Receive Standby 0.5 Amp 0.5 Amp
	Receive Full Audio 0.8 Amp 0.8 Amp
	Max TX: (150W) 24 Amps 14 Amps (60W) 14 Amps 7 Amps
Output Impedance	50 ohms
Transmitter Output Power	R3E, J3E 150 Watts PEP F2B >100 Watts LOW 50 - 75 Watts VLOW 25 - 40 Watts
Receiver Sensitivity	≤ 1 μV for 12 dB SINAD
Audio Output	3 W @ ≤ 10% distortion into external 4 ohm load. 2 W internal
2187.5 kHz Receiver Sensitivity	≤ 1 μV for 20 dB SINAD
DSC Facility	≤ 1 μV for 10 ⁻² B.E.R.

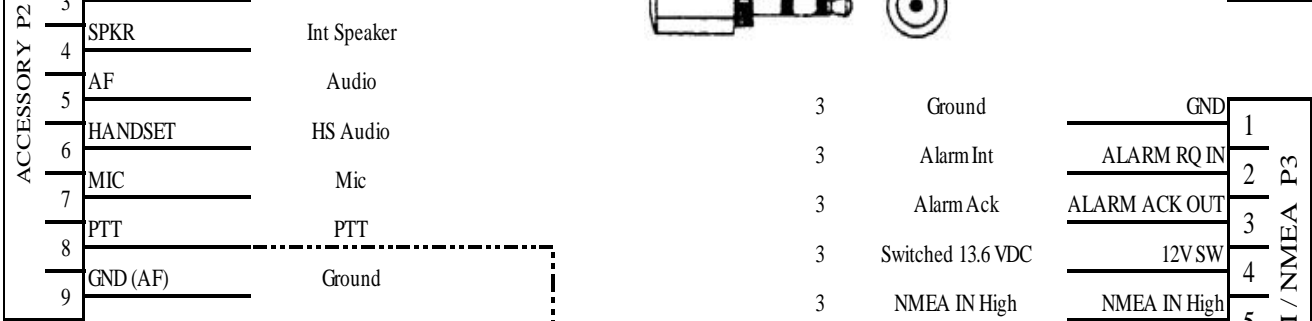
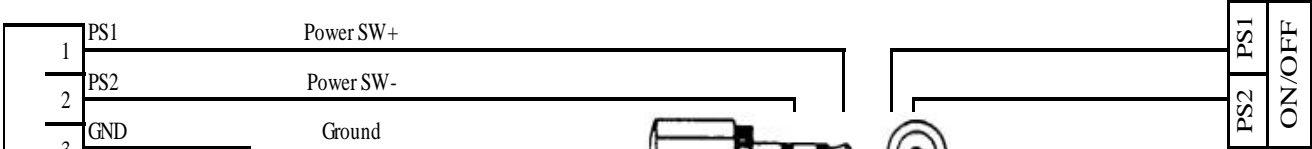
GENERAL OPERATIONS

SEA 245 / 2451 to 2450 Interconnect Diagram

SEA 2450

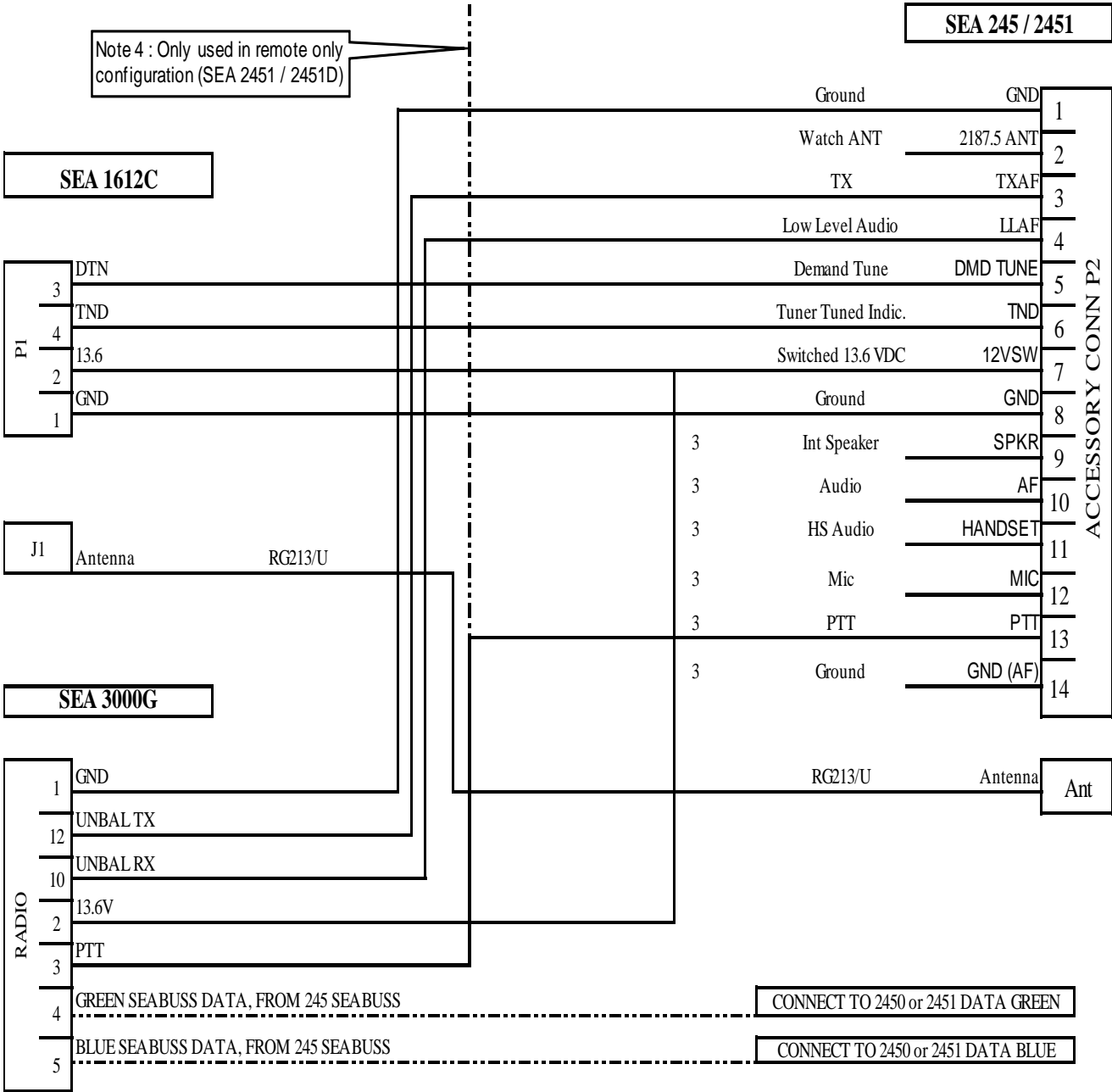
SEA 245 / 2451

	Description	Wire Type	Notes	Description
SEABUSS P1	1 GND System common ground	#16 BLK		Ground 1
	2 12VSW Switched 13.6 VDC	#16 RED		12V SW 2
	3 PTT PTT	VIO		PTT 3
	4 DATA Balanced data line RS485	GRN	1	Data 4
	5 DATA Balanced data line RS485	BLU	1	Data 5
	6 AF Balanced Audio	YEL	2	AF 6
	7 AF Balanced Audio	BRN	2	AF 7
	8 Unused			Unused 8
	9 GND System common ground	All Shields		Ground 9



Note 4 : Only used in remote only configuration (SEA 2451 / 2451D)

SEA 245 / 2451 to 2450 Interconnect Diagram (Cont.)



Notes 1 : Twisted pair w/shield

Notes 2 : Twisted pair w/shield

Notes 3 : Not available in remote only configuration (SEA 2451/2451D), connect at 2450 control head

Notes 4 : PTT from 3000G goes to PTT on 2450 in a remote only configuration (SEA 2451 / 2451D)

GENERAL INFORMATION**CAUTION !**

Do not attempt to transmit until the radiotelephone has warmed up for at least 3 minutes. Transmitting before the 3 minute warm up period may cause a violation of the Federal Communications Commission regulations.

PROPAGATION

Medium frequencies (MF) in the range of 300 kHz to 3 MHz propagate far beyond the horizon. MF frequencies are generally usable within 300 miles depending on time of day, atmospheric conditions and man-made noise levels.

High frequencies (HF) in the range of 3 MHz to 30 MHz allow communications over thousands of miles, again subject to the time of day and atmospheric conditions. Interference tends to be more of a problem than on very high frequencies (VHF) in the range of 30 MHz to 300 MHz.

To further understand MF/HF propagation, SEA's "Mariner's Guide to Single Sideband" (MAN-0001-001) is highly recommended reading.

INSTALLATION

It is recommended that an authorized SEA dealer perform the installation of your MF/HF equipment to assure proper operation. For complete installation instructions, refer to the "SEA 245 Installation Manual" (OPR-245-INST) supplied with the radio.

DC Connections

The SEA 245 is configured to operate from either 13.6 or 24 volts DC (direct current). Check the rear panel of the radio to determine the proper operating voltage required. A direct connection to the power source is recommended. Proper wire size must be used between the radio and power supply to prevent the DC voltage at the radio from dropping below 21.6 volts during transmit conditions. Should this occur, the radio will drop to low power during transmit to prevent distorted transmissions.

Connect the RED positive (+) lead from the radio to the positive supply terminal. The BLACK negative (-) power lead should connect to the negative supply terminal. A #10 ground stud is provided for connecting the radio chassis to the ship's earth connection with a copper strap.

RF Connections

A radio frequency (RF) ground plane with a minimum of 100 sq. ft. is required for proper operation. This ground system is not unique to SEA equipment. All marine MF/HF radios have the same installation requirements for maximum efficiency. Every connection to the ground should be made with a minimum of 2" wide copper strap.

The SEA 245 is equipped with two rear-panel RF connectors for the installation of two independent antennas. The nominal impedance of each antenna is 50Ω which requires use of high quality RG-213/U or equivalent coaxial cable.

Watch Receiver**P2 Accessory Connector, pin #2**

This antenna allows constant monitoring (i.e., receive only) of the MF DSC channel, 2187.5 kHz. Ground for this antenna input is available at pin #1 of the same connector.


Main Receiver/Transmitter**SO239 Bulkhead Connector**

This antenna, labeled "ANTENNA 50 OHMS", is used for normal radio receive and (up to) 150 watt transmit operations.

Radio Protection

The chassis of the 24V SEA 245 is not connected to either supply rail. This allows a direct connection to the ship's earth connection for voltage and RF interference protection. In the event that the input voltage is reversed, the line fuse (20 amp for 12 volt operation or 10 amp for 24 volt operation) will blow. It is also likely that the internal reverse polarity protection diode will be damaged in order to protect the remaining circuitry. Overvoltage to the radio will cause similar results. If this should occur and a replacement fuse also blows, an authorized SEA dealer should be contacted for proper service repairs.

The SEA 245 monitors radio conditions such as DC supply voltage, internal temperature and antenna VSWR. When these conditions are outside the preset limits, the radio will revert to low power (approximately 75 Watts). The display's LOW indicator will light to indicate this condition. If this should

occur during an EMERGENCY situation, pressing  while the radio is keyed will override the monitoring sensors and allow FULL output power. The radio will stay in the EMERGENCY OVERRIDE condition until the radio power is re-cycled.

UNDERSTANDING CHANNEL MEMORY**CHANNELS**

Nearly 1000 frequency pairs are stored as permanent channels in the SEA 245. These channels are recalled by their assigned ITU or SEA channel number. ITU numbers are known internationally and include all duplex frequency pairs starting at 4 MHz and ending with 25 MHz. SEA numbers are assigned to those frequencies that do not have an assigned ITU number. Currently all 2 to 3 MHz frequencies and all simplex frequencies (as well as DSC calling channels?) are assigned SEA channel numbers.

It is important to note that not all radios use the same channel numbers for simplex or 2 to 3 MHz frequencies. Some radios use an “A”, “B”, “C” channel assignment for frequencies not assigned an ITU channel number. For example, if you refer to the SEA simplex channel 451 during communications, the person you are communicating with may not have a channel 451. Their radio may have the same frequency (4146.0 KHz) assigned to channel “4A”. For reliable communications, always refer to the frequency when referencing simplex channels or frequencies below 4 MHz.

BINS

In addition to the permanent memory, 200 user programmable channels known as bins have been assigned for “scratchpad” memory. Approximately 170 of these 200 channels have been programmed by SEA but may be changed at any time. Bins may be programmed with any frequency, mode of transmission and given a name tag besides a bin number.

SCAN CELLS

Consecutive bin numbers that have the same first three characters in their name tag, are known as “scan cells”. SEA has programmed 170 of the 200 possible bins into 23 different scan cells. Scan cells may be as short as one bin or as long as 200 bins but should be kept to a reasonable length for scanning efficiency. Each scan cell is organized with frequency pairs that are related to one another. For example, bins 13 through 30 have been programmed with frequencies assigned to the coast station KMI. Since the name tag’s first three characters are “KMI”, and the bins are consecutively numbered, the bins may be scanned as a group. If the bins do not have the same first three characters, the scan cell will be split into two different cells. For instance, if bin 20 is renamed to “SEA 1”, the KMI scan cell will be split into two cells. One cell will contain bins 13 through 19, while the other cell will contain bins 21 through 30. Bin 20 will be a single channel scan cell called “SEA”. Scanning “KMI” could be done by scanning bins 13 through 19 **OR** bins 21 through 30 but not both at the same time.

GENERAL OPERATIONS

Care should be taken so that a scan cell is not split unintentionally. Bins that will not be scanned can be given any descriptive name tag.

LCD DISPLAY CHARACTERS

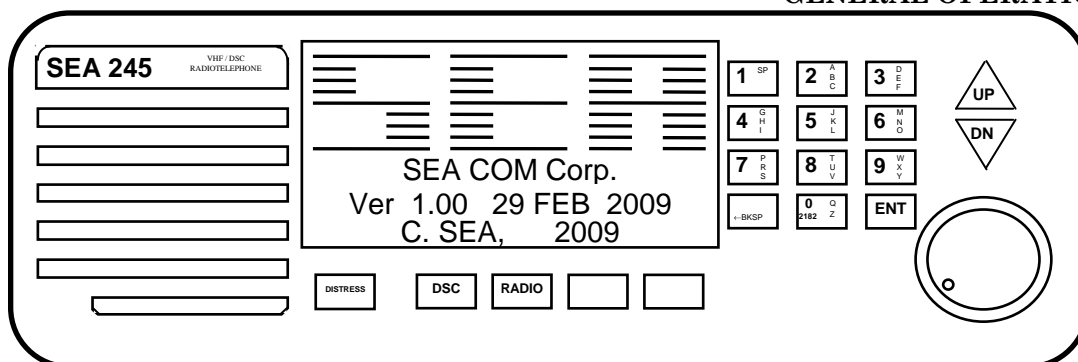
- NB** The noise blanker is activated.
- TX** The radio is in TRANSMIT.
- HI** Indicates the radio will transmit using 150 watts of output power.
- LOW** Indicates the radio will transmit using 75 watts of output power.
- VLO** Indicates the radio will transmit using 40 watts of output power
- USB** Default Marine upper sideband mode.
- AME** The radio will transmit a reduced carrier (H3E) of approximately 40W. (This mode is only available on the emergency frequency 2182.0kHz.)
- LSB** Both transmit and receive will use lower sideband mode.
- ITU** International Telecommunications Union channel.
- VCE** Voice (J3E) mode will be used for transmit and receive.
- TLX** Telex (J2B) mode will be used for transmit and receive.
- DSC** Same as Telex but uses a DSC channel.
- CW** CW (A1A) mode will be used for transmit and receive.
- AM** True AM mode will be used for receive. This is a receive-only mode.
- TND** The attached antenna coupler has finished the tune process and has attained a tune.
- SQL** The receiver squelch is activated.



Relative output power when transmitting and audio signal strength during receive. No bars indicates weak signal.

FRONT PANEL CONTROLS

- CH
FX** Toggles display to show channel/bin #, frequency or alpha name.
- 0 - 9** Allows entry of channel and frequency information, alphanumeric information and menu selections. 0 used alone recalls the emergency frequency, 2182.0 kHz
- DISTRESS** Initiates an Emergency DSC call.
- DSC** Selects DSC operations.
- RADIO** Toggles between radio menu selections and normal operations. Aborts DSC operations.
- SQL**
Print Toggles squelch on/off when in normal radio operation Selects print feature in other modes.
- MODE**
← BKSP Selects operating mode (USB, LSB, TLX, AME). Also serves as a backspace key when used for alphanumeric entry or selects previous menu.
- ENT** Selects displayed function or completes keyed entry .
- UP** Increases squelch, channel, frequency, alphanumeric and contrast settings. Also scrolls through DSC memory logs.
- DN** Decreases squelch, channel, frequency, alphanumeric and contrast settings. Also scrolls through DSC memory logs.



BASIC OPERATION

To turn the radio on, rotate the volume control clockwise until a click is heard.

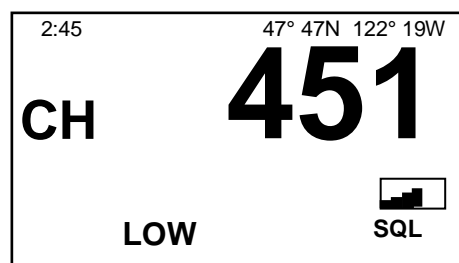
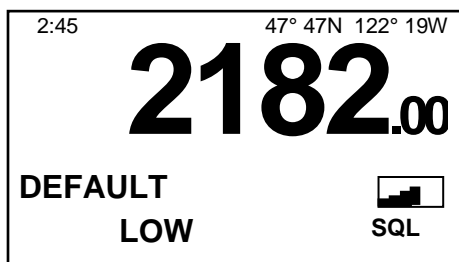
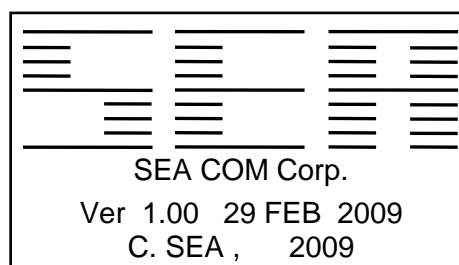
Rotating the volume control clockwise after the click is heard will increase the volume level.

Rotate the volume control fully counter-clockwise to turn the radio off.

Press **SQL** Print to activate the squelch.

Enter the desired channel number in three or four digit form, followed by the **ENT** key.

e.g.: **4** GHI **5** JKL **1** SP **ENT**



The display will show the channel number as entered then change to display the receive frequency.

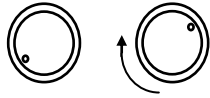
Your SEA 245 is now set to transmit and receive on the selected channel.

For instructions on enabling other radio functions, see the table of contents for the page number corresponding to the specific function.

Illustrations in this manual reflect the use of an attached SEA 1612C tuner. Differences in tuner choice or radio programming may produce varying displays.

TURNING THE RADIO ON

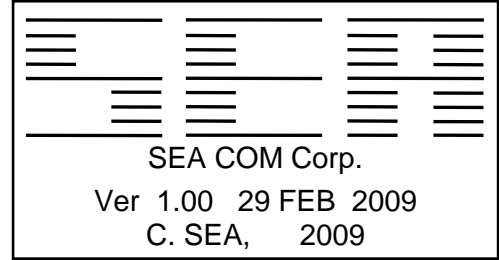
Rotate the volume control clockwise until a click is heard.



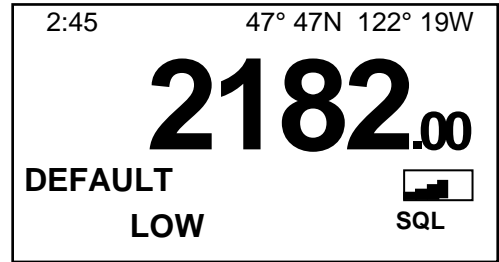
A checkerboard display will be shown for a short period followed by the software version. The radio will then be set to the MARINE mode on international emergency frequency 2182.0 KHz using USB, J3E mode.

Wait 3 minutes for the synthesizer to stabilize before transmitting.

Rotating the volume control clockwise beyond the click will increase the volume level.



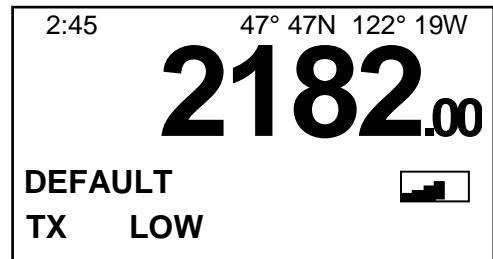
Software version number and date



2182.0 kHz or last channel is recalled at powerup

OPERATING THE TRANSMITTER

Keying the microphone push-to-talk button will switch the transmitter circuits on, indicated by the “TX” indicator appearing on the display. Speak in a normal voice with your lips about one eighth of an inch away from the microphone. Do not shout. Shouting reduces intelligibility. The number of bars displayed will change as the operator talks.



THE TUNED INDICATOR

The display's "TND" indicator shows that the SEA 1612 series antenna tuner has successfully matched the antenna to the radio for maximum radiated power. When the radio tuner mode is enabled, entering a frequency or channel will cause the "LOW" indicator to appear during PTT. Speaking into the microphone when the PTT is pushed will allow the tuner to find a match. The "TND" indicator will be displayed and the "LOW" indicator will change to the "HI" indicator allowing full 150 watts output power.

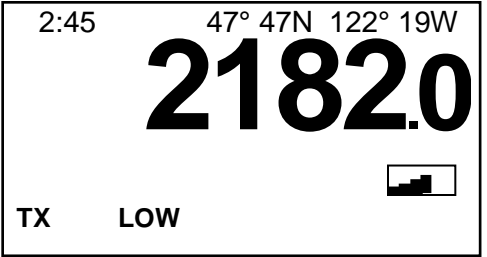
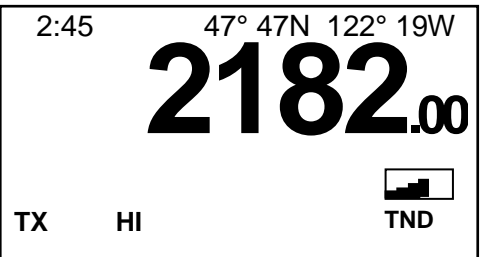
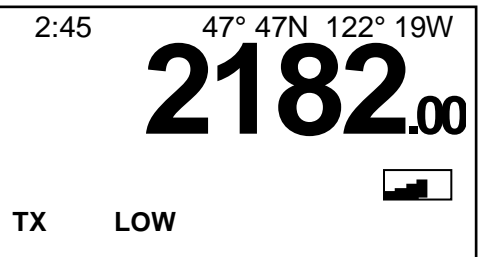
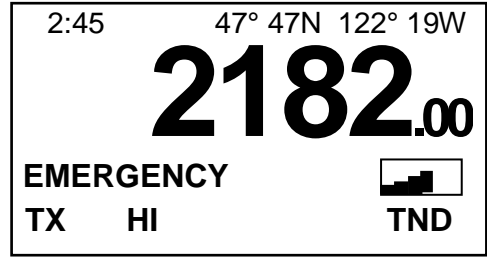
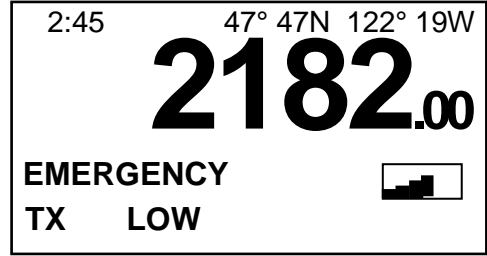
NOTE: *If a frequency or channel has never been used, the "match" will take slightly longer.*

DEMAND TUNE

When the tuner senses a high VSWR, it will attempt to match the antenna automatically during transmit. The Demand Tune function signals the tuner to undergo a complete tune cycle even with an acceptable VSWR. This may be needed on those rare occasions when the "TND" indicator does not appear or when the operator suspects the match could be better. For the Demand Tune function to operate, the SEA 1612C tuner must have the 'DTN' terminal connected to the SEA 245's rear panel accessory connector P2 pin 5 (DMD TUNE). The '2= TUNR' option in the RADIO, 1= MORE, 6= CFG menu also must be selected to TUNR (on) versus TNOF (TuNer Off). Better tunes may occur using Demand Tune.

To Demand Tune, key the radio by holding the PTT button on the microphone down, then

press and release  to start the tune cycle.



GENERAL OPERATIONS

The “TND” indicator will turn off, the “LOW” indicator will turn on and the radio will transmit the demand tune signal.

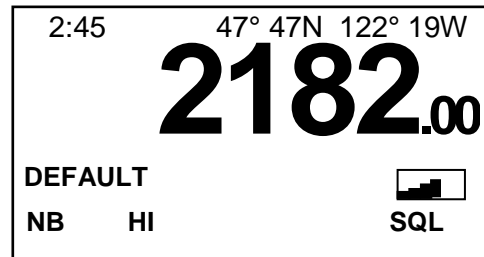
When the tuner has successfully completed the match, the “LOW” indicator will change to “HI” as the “TND” indicator appears. “TND” should then light whenever the microphone PTT is pressed.

In the event that the tuner cannot find a match in 15 seconds, the radio will stop transmitting the demand tune signal and while PTT is still pressed the display will still say “TX” and “LOW”. Voice operation can start at this time but will only be at low power. “TND” and “HI” power will only occur when the tuner is matched.

When tuning just with voice, “LOW” will be displayed until the tune cycle has successfully completed the antenna match and “TND” is lit. Once TND is reached, display will read **VSWR** and its multiplier, 1.0 as an ideal example representing a Voltage Standing Wave Ratio of 1.0:1.

NOISE BLANKER OPERATION

Press **RADIO** **2** A
B
C to toggle the noise blanker on / off. The “NB” indicator shows the noise blanker is on. The noise blanker will help reduce impulse noise that may be caused by on board equipment such as a bilge pump or refrigerator compressor.



SELECTING A VOICE CHANNEL

Enter the desired three or four digit ITU/SEA channel number followed by **ENT**

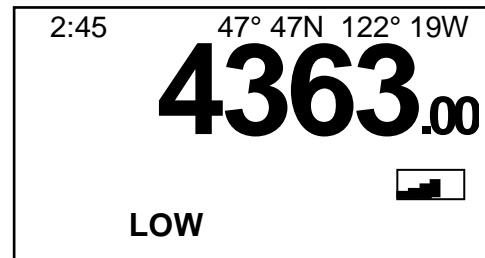
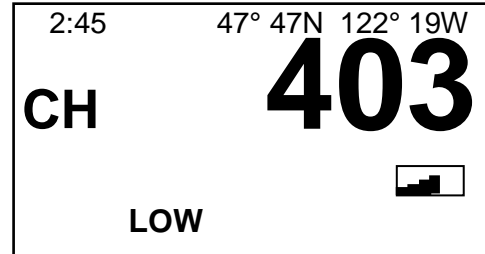
e.g. : **4** ^G_H_I **0** ^Q_Z₂₁₈₂ **3** ^D_E_F **ENT**

The display will show the channel entered followed by the receive frequency for the selected channel.

Press **CH**/**FX** to switch between the channel number display and the frequency display.


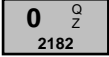


When the microphone PTT button is pressed, the transmit frequency will be displayed when in frequency display mode.

If the channel does not exist, the radio will revert to the last channel entered.




SELECTING A TELEX CHANNEL

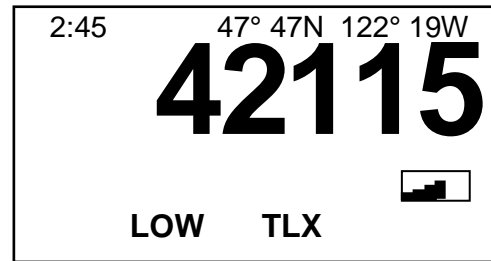
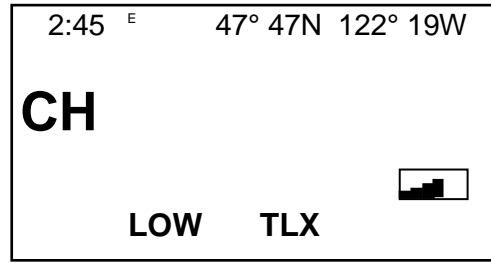
The SEA 245 is capable of telex operations when used with an appropriate modem. Enter the desired three or four digit ITU/SEA telex channel number followed by

e.g.     .

The display will show the channel entered followed by the receive frequency for the selected channel.

Press  to switch between the channel number display and the frequency display.

When the microphone PTT button is pressed, the transmit frequency will be displayed when in frequency display mode. If the channel does not exist, the radio will revert to the last channel entered.



SELECTING A CHANNEL BY BIN NUMBER

Enter the desired one, two or three digit bin number followed by **ENT**.

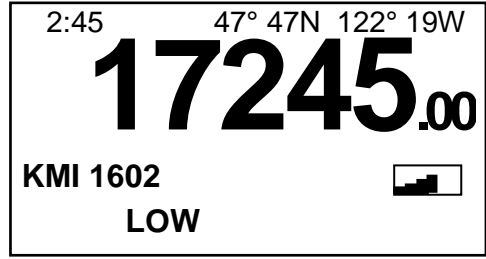
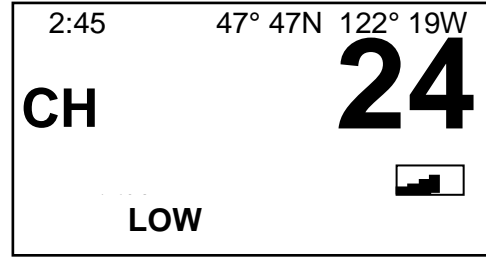
e.g. : **2** A B C **4** G H I **ENT**

The display will show “CH 24” for 1 second followed by the receive frequency for the selected channel.

Press **CH FX** to switch between the channel number display and the frequency display.

When the microphone Push To Talk button is pressed, the transmit frequency will be displayed when in frequency display mode.

If the bin is not programmed, the radio will revert to the last channel entered.



CHANGING THE DISPLAY VIEW

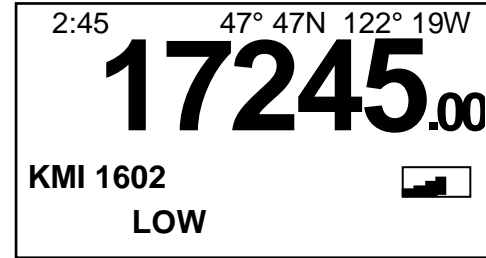
CH FX is used to change the display view between the channel number and the associated frequency for that channel.

For bins (channels 0-199) the alphanumeric name tag is also shown in both channel and frequency displays.

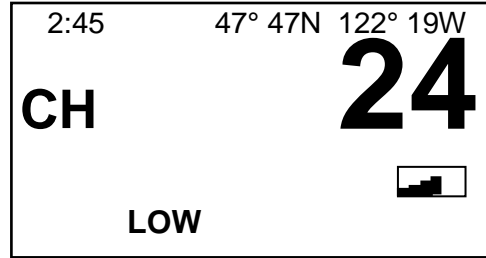
To display the transmit frequency, press

CH FX

to have the display show the receive frequency. Press the microphone PTT to display the transmitter frequency.



FREQUENCY DISPLAY WITH ALPHA TAG

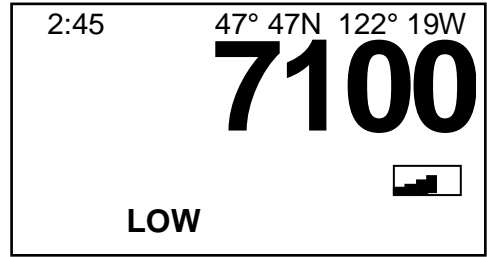


CHANNEL DISPLAY WITH ALPHA TAG

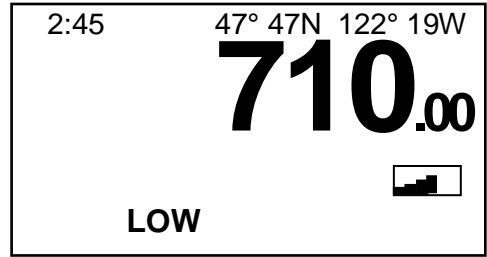
ENTERING A RECEIVE ONLY FREQUENCY

Enter any frequency using four, five, or six digits followed by **ENT**.

e.g.: **7**^{PRS} **1**^{SP} **0**^{QZ}₂₁₈₂ **0**^{QZ}₂₁₈₂ **ENT**



If the frequency entered is less than 490.0 KHz or greater than 29999.99 KHz, the radio will revert to the last channel entered.



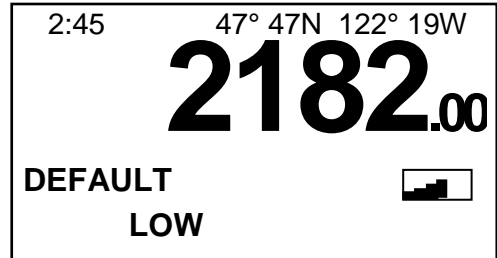
Transmitting on a receive only frequency is not allowed.

CH FX will not operate in receive only mode.

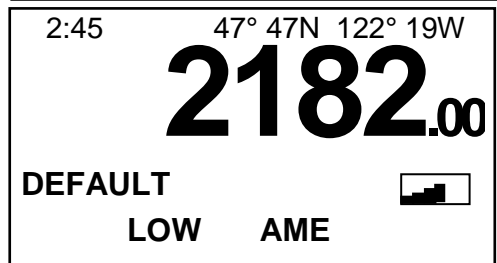
SELECTING THE EMERGENCY CHANNEL

Press **0**^{QZ}₂₁₈₂

The radio will switch to the international emergency frequency of 2182.0 KHz using J3E (USB) mode.




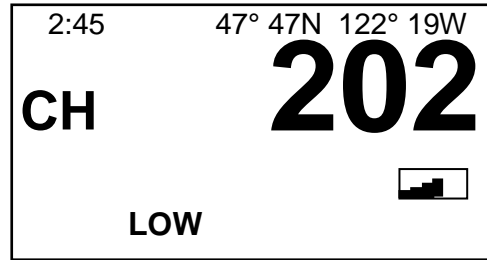
If H3E (AME) mode is required, press **MODE** ← **BKSP** repeatedly until “AME” is displayed. The radio is now ready to transmit an AME signal using a 40 W carrier.



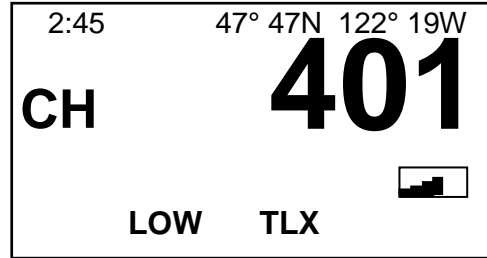
Pressing **CH FX** will have no effect.

SELECTING AN OPERATING MODE

Pressing the  key will cycle the radio through the available operating modes: upper sideband, telex, DSC, H3E, CW, lower sideband, and true AM. Not all modes are available on all channels. If the current channel number is not assigned to any frequency in the selected mode the radio will disallow the changes of mode if an ITU Voice or Telex channel has been selected, but will allow mode to change for RX ONLY when a USERFREQ frequency has been entered.



Voice channel 202



Telex channel 401

SENDING THE DISTRESS ALARM SIGNAL

Press **ENT** to stop any entry in progress.

Press **0** ^{QZ} ₂₁₈₂ to select 2182.0 KHz.

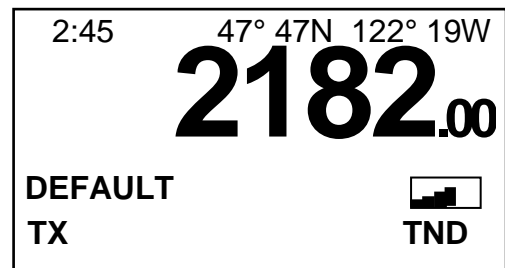
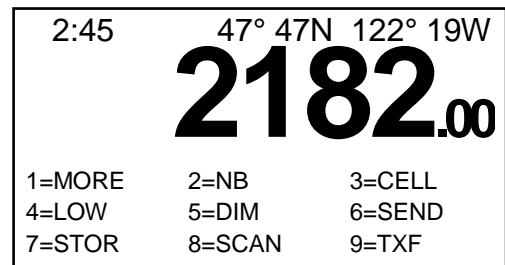
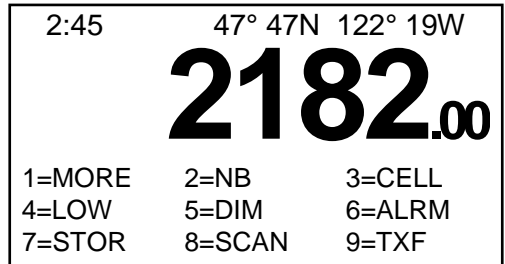
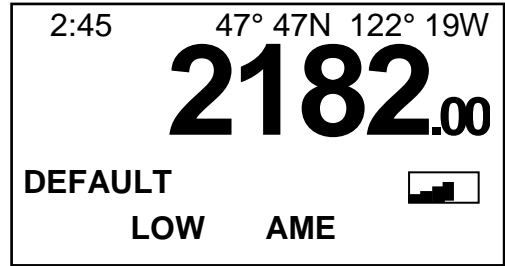
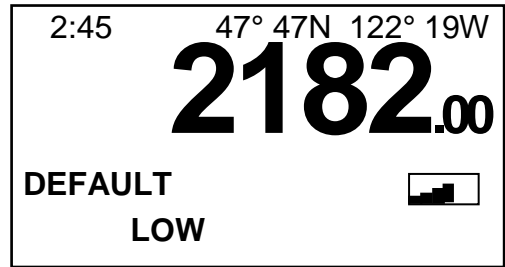
If H3E (AME) mode is required, press **MODE** [←] _{BKSP} repeatedly until “AME” is displayed. AME is only available on 2182.0 KHz.

To transmit or test the alarm signal, press the **RADIO** key then press **6** ^{MNO}.


RADIO **RADIO** **6** ^{MNO} You will hear the alarm tones through the speaker but no signal will be transmitted. This alarm test will continue for 45 seconds unless aborted by pressing **RADIO** or preempted by pressing **6** ^{MNO} again to transmit the alarm.

The radio will transmit the alarm for 45 seconds unless stopped by pressing **RADIO**.


The two tone alarm signal can be transmitted on all available frequencies. It is not necessary to use 2182.0 KHz for the alarm generator to function. Alarm transmission is indicated by local audio and “TX” is lit until cancelled or timed out.

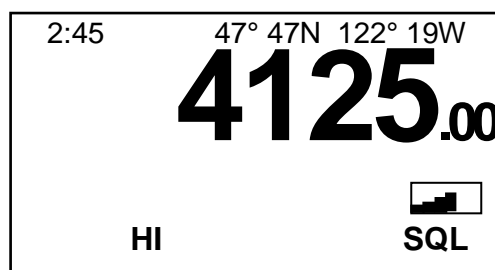


OVERRIDE

When operating conditions are outside the normal preset limits, the radio will revert to low power (approximately 75 Watts). The display's "LOW" indicator will light to indicate this condition. If this should occur during an EMERGENCY situation, pressing  while the radio is keyed will override the monitoring sensors and allow FULL output power. The radio will stay in the EMERGENCY OVERRIDE condition until the radio power is re-cycled. If the power has been reduced manually, the override will not increase to full power.

SQUELCH OPERATION

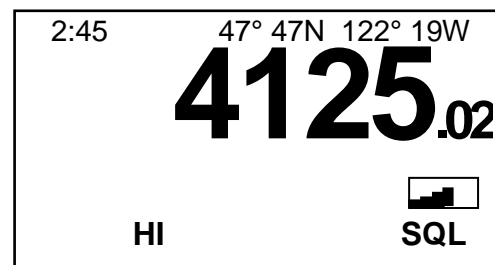
Use the  key to toggle the squelch on / off. The "SQL" indicator indicates that the squelch is on. The speaker will mute after approximately 2 seconds. Varying audio frequencies will open the squelch but not a steady tone.





CLARIFIER OPERATIONS

In the "MARINE" operating system, the clarifier tuning range is limited to ± 200 Hz when used on any ITU/SEA channel. When the radio is turned on, the clarifier step size will default to 10 Hz.

Any receive only frequency or any frequency used in the "AMATEUR" operating system has an unlimited clarifier range and may be changed in steps of 10 Hz, 100 Hz, 1 KHz, or 10 KHz.



The clarifier is operated by pressing the  or  buttons. To change the clarifier resolution, press "1" for 10 Hz steps, "2" for 100Hz steps, "3" for 1 kHz steps or "4" for 10 kHz steps, followed by "UP" or "DN" within 3 seconds. The clarifier resolution will remain as selected until changed, or power to the radio is cycled. Clarifier resolution will also revert back to ± 10 Hz when an ITU/SEA marine channel number is entered while in the AMATEUR mode, but will not change when a user-programmed bin number is entered.

OPERATING THE MEMORY BROWSE

Browse enables a manual scan of all channels or bins programmed in the radio.

To invoke the Memory Browse function, press **RADIO** **1**^{SP} **4**^{GHI} then **UP** or **DN**.

Pressing **UP** will change the channel to the next channel in memory.

Pressing **DN** will change the channel to the previous channel in memory.

CH FX will toggle between channel number and frequency modes.

Memory browse will not scan through bins and channels at the same time. If a channel is selected and you wish to browse the bins, select a bin number from which to start.

When the last bin or channel is selected, the next step will go to the beginning of the bin or channel list.

To exit memory browse, press the microphone Push To Talk button briefly, press ENTER, or recycle the radio power

2:45 47° 47N 122° 19W
CH 403
 1=MORE 2=NB 3=CELL
 4=LOW 5=DIM 6=ALRM
 7=STOR 8=SCAN 9=TXF

First RADIO menu

2:45 47° 47N 122° 19W
CH 403
 1=PREV 2=ITCM 3=SCMD
 4=BRWS 5=AMTR 6=CFG
 7=BEEP 8=NAME 9=VER

Second RADIO menu

2:45 47° 47N 122° 19W
CH 404
LOW

Next ITU channel in memory is 404

2:45 47° 47N 122° 19W
CH 402
LOW

Previous ITU channel in memory is 402

SELECTING THE RADIO MENU

Several advanced radio options are accessed by pressing the **RADIO** key.

The most commonly used functions will be displayed in the first menu. The second menu is accessed by pressing **1^{SP}**.

Pressing the **RADIO** key at any time will abort the menu selection and the radio will return to normal operations.

2:45	47° 47N	122° 19W
CH	403	
1=MORE	2=NB	3=CELL
4=LOW	5=DIM	6=ALRM
7=STOR	8=SCAN	9=TXF

Primary Radio menu selections

2:45	47° 47N	122° 19W
CH	403	
1=PREV	2=ITCM	3=SCMD
4=BRWS	5=AMTR	6=CFG
7=BEEP	8=NAME	9=VER

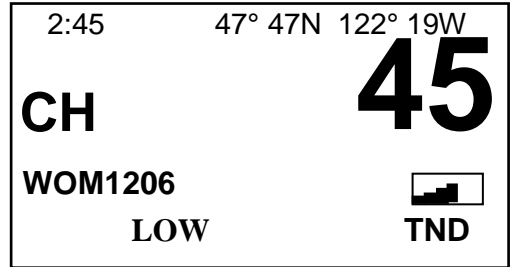
Secondary Radio menu selections

CHANGING THE TRANSMIT POWER LEVEL

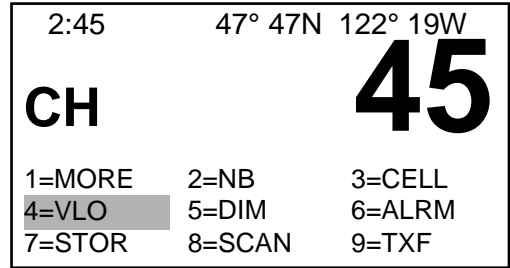
The transmit power level may be changed between HI (150W), LOW (75W), and VLO (40W). The display will show the current setting while the menu selection shows what the power level will become.

Press **RADIO** **4** ^G_H_I to cycle through the various power levels.

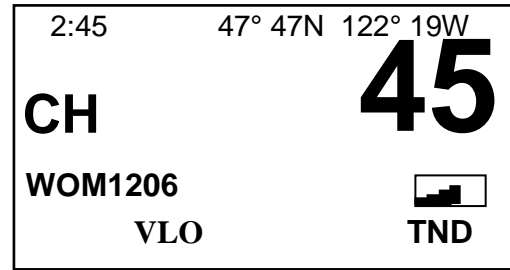
NOTE: When the radio is set up to operate with a tuner, and the tuner is not matched to the antenna, the radio's **LOW** annunciator will appear. The radio will not go to high power until the tuner has matched the antenna.



Channel 45 at LOW power setting



Changing from LOW to VLO



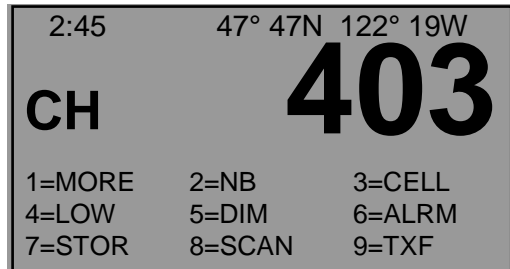
Channel 45 at VLO power setting

LCD CONTRAST ADJUSTMENT

The display's contrast setting may need to be adjusted to compensate for differences in temperature and viewing angle.

To change the contrast level press **RADIO**

followed by **UP** or **DN**.



Low contrast setting

The keys may be held or pressed repeatedly.

Pressing **RADIO** will exit the contrast adjustment.

DIMMING THE BACKLIGHTING

The display and keypad backlighting may be changed by pressing the **RADIO** and keys.

Repeatedly pressing the **5** ^J_K_L key will cycle the backlighting through 3 levels or off.

Pressing **RADIO** will exit the backlighting adjustment procedure.

If the backlighting is set to off, the first key press will turn the backlighting on to the lowest level for 5 seconds.

2:45	47° 47N 122° 19W	
CH	403	
1=MORE	2=NB	3=CELL
4=LOW	5=DIM	6=ALRM
7=STOR	8=SCAN	9=TXF

Radio 5 changes backlighting

PROGRAMMING AND ERASING BINS

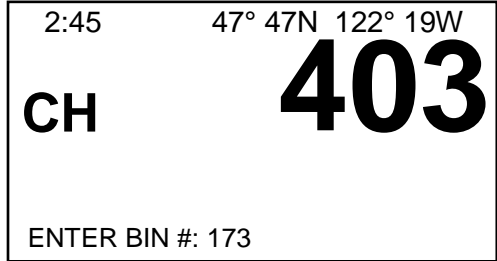
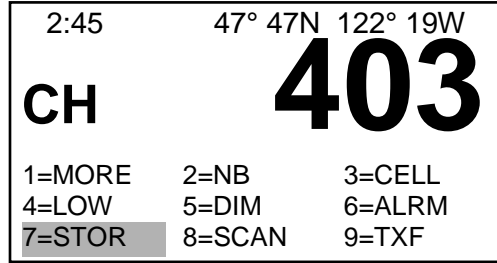
After selecting a channel or commonly used frequency (but not a bin in scratchpad memory), the displayed information may be saved into any bin location for rapid recall or scanning. This includes the mode of operation such as LSB, receive only, etc.

To save the displayed information, press



. You will be prompted for a bin number. If the bin is already programmed you will be asked to confirm overwriting. You will also be prompted for an alphanumeric name tag. If the previous bin is programmed, the radio will suggest a new name that will add the channel to the previous bin's scan cell. If you do not wish to add this channel to the previous channel's scan cell, you may modify the name by changing at least one of the first three characters.

Finally you will be prompted for scan mode. This is the mode in which the channel will be scanned whenever scan is selected. It applies to all channels in the scan cell. See the next section for a description of the various Scanning modes.

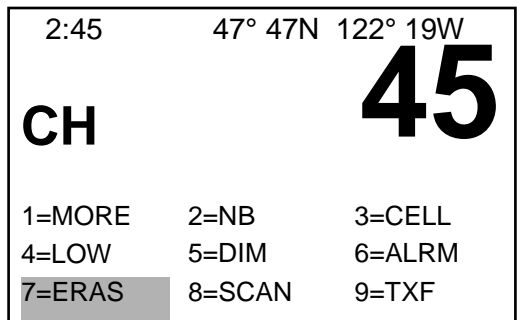
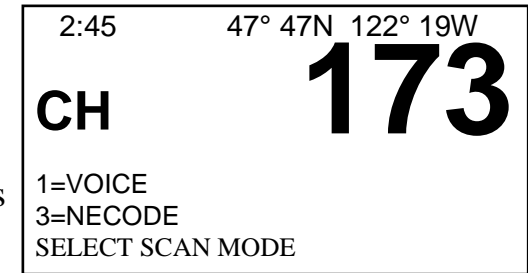


To rename a bin see the section below entitled "Naming A Channel".

To erase a bin from scratchpad memory it must be the selected channel. To erase, press



. You will be prompted for confirmation.



SCANNING A CHANNEL GROUP

Consecutive bin locations that have the same first three characters in their name tag are known as “scan cells”. SEA has programmed 170 of the 200 possible bins into 23 different scan cells. Scan cells may be as short as one bin or as long as 200 bins but should be kept to a reasonable length for scanning efficiency.

Each scan cell is organized with frequency pairs that are related to one another. To scan a group of channels, first select a bin within a scan cell.

E.g., to scan the KMI marine operator channels programmed in bin locations 13 through 30, select any bin between 13 and 30 followed by “ENT”.

Press **1**^{SP} **6**^{DEF} **ENT**

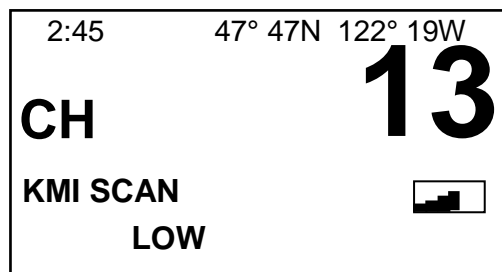
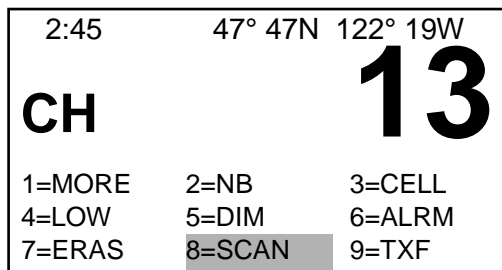
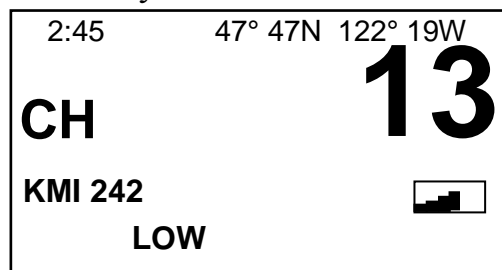
After the name is shown for the selected bin,

press **RADIO** **8**^{TUV} to start the scan.

The radio will turn on the “SQL” indicator and begin the scan of bins 13 through 30 using the scan mode that was programmed when the bin was stored.

For VOICE scan the first time through the scan cell, each bin is sampled for approximately 7 seconds. When the last bin in the scan cell has been sampled, the scan speed will increase to 1 bin every ¼ second. When an audio signal is received, the radio behavior depends on the scan mode selected (see scan mode section below). If the continuous scan mode is currently selected the radio will open the squelch and stay on channel for as long as the signal is present and changing. If the stop-and-go scan mode is currently selected the radio will stay on the channel for a maximum of 5 seconds and continue to the next bin even if the signal is still present. This is a good selection when scanning active channels.

“TELEX” scan reduces the speed to 1 channel every 4 seconds. The additional time is required to determine when a valid signal is present.





“NECODE” scan is a special scan mode that looks for a 2 KHz tone indicating a possible Nocode signal. The scan speed is increased to approximately 5 channels every 1/2 second.

SEARCHING SCAN CELLS

In many cases it is difficult to remember where a frequency is stored by its bin number. The CELL function along with *Memory Browse* is a useful method for locating a particular bin.

Press **RADIO** **3** then  or .

Pressing  will change the channel to the first channel of the next scan cell in memory.


Pressing  will change the channel to the first channel of the previous scan cell in memory.

The browse feature described earlier can be used to search within a scan cell.


To exit scan cell search, press the microphone Push To Talk button briefly, press ENTER, or enter browse mode.

2:45 47° 47N 122° 19W
CH 45
 1=MORE 2=NB 3=CELL
 4=LOW 5=DIM 6=ALRM
 7=STOR 8=SCAN 9=TXF

First RADIO menu

2:45 47° 47N 122° 19W
CH 59
 WOO 232 
 LOW

Next scan cell (WOO) starts at 59

2:45 47° 47N 122° 19W
CH 13
 KMI 242 
 LOW

Previous scan cell (KMI) starts at 13

SCAN OPTIONS

The scan options modify how the radio will react to an active channel when scanning in voice mode.

Pressing **RADIO** **1**^{SP} **2**^{A B C} modifies the way Scan operates by allowing either stop and go or continuous operation.

Stop and go operation, will stop on an active channel for the duration of the hang period and then go to the next channel even if the channel is still active.

Continuous operation, will stop on an active channel and continue to monitor the channel as long as it is active. When the channel becomes inactive, the radio moves to the next channel.

2:45 47° 47N 122° 19W

CH 403

1=MORE 2=NB 3=CELL
4=LOW 5=DIM 6=ALRM
7=STOR 8=SCAN 9=TXF

2:45 47° 47N 122° 19W

CH 403

1=PREV 2=ITCM 3=SCMD
4=BRWS 5=AMTR 6=CFG
7=BEEP 8=NAME 9=VER

2:45 47° 47N 122° 19W

CH 403

1=CONTINUOUS
2=STOP AND GO
SCAN MODE=CONTINUOUS

NAMING A CHANNEL

On the main radio display screen a 7-character (for receive only channels) or an 11-character (for transmit/receive channels) alphanumeric name is shown below the channel number or frequency for scratchpad channels.

To modify the name, press the **RADIO** key

followed by the **1**^{SP} key to access the radio menu.

Press the **8**^{T U V} key to modify the name of the displayed channel. A cursor will appear at the end of the highlighted name. Pressing any

key other than **MODE** ← BKSP will overwrite the entire name. Pressing the **MODE** ← BKSP will backspace over and erase the last character.

Use the alphanumeric keys to enter letters and digits. The **UP** and **DN** keys will cycle


2:45 47° 47N 122° 19W

CH 45

1=PREV 2=ITCM 3=SCMD
4=BRWS 5=AMTR 6=CFG
7=BEEP 8=NAME 9=VER

2:45 47° 47N 122° 19W

CH 45

WOM1206 
LOW

2:45 47° 47N 122° 19W

CH 45

1=VOICE 2=TELEX
3=NECODE
SELECT SCAN MODE <1

through the characters on the key. When the desired channel name has been entered, press **ENT** to continue. You will then be prompted for the scan mode to use for this scan cell.

Care should be taken when renaming bins. When a bin is renamed, a scan cell in which the bin is located will be split. For example, bins 13 through 30 have been programmed with frequencies assigned to share the same first three characters in their name tag, coast station KMI. Since the name tag's first three characters are "KMI", and the bins are consecutively numbered, the bins may be scanned as a group. If the bins do not have the same first three characters, the scan cell will be split into two different cells. For instance, if bin 20 is renamed to "SEA 1", the KMI scan cell will be split into two cells. One cell will contain bins 13 through 19, while the other cell will contain bins 21 through 30. Bin 20 will be a single channel scan cell called "SEA". Scanning "KMI" could be done by scanning bins 13 through 19 **OR** bins 21 through 30 but not both at the same time.

DIRECT FREQUENCY

When a frequency is entered into the radio, it is a receive only frequency. The 'Direct Frequency' function allows the operator to input a transmit frequency.

To enter a transmit frequency using the direct frequency function press **RADIO** **9** ^W_X^Y.

At the "TX FREQ" prompt, enter the transmit frequency followed by **ENT**. Use the **MODE** [←]_{BKSP} key to change modes. If both the transmit and receive frequencies are the same you may press **ENT**. The transmit frequency must be in the range of 1600.0 KHz to 29999.9 KHz. Frequencies outside this range will not be accepted.

Under normal operations, USB is used for all marine communications.

2:45 47° 47N 122° 19W
12245.00
 1=MORE 2=NB 3=CELL
 4=LOW 5=DIM 6=ALRM
 7=STOR 8=SCAN 9=TXF

2:45 47° 47N 122° 19W
12245.00
 TX FREQ: 12245.0 TLX

2:45 47° 47N 122° 19W
12245.00
 TX FREQ: 12245.0 USB

INTERCOM

When multiple controllers are connected to the SEA 235, the radio may be used as an all station intercom system.

Press **RADIO** **1**^{SP} **2**<sup>A
B
C</sup> to start the intercom.

Speaking into the microphone when the PTT button is pressed will allow all other controllers to hear what is spoken. When in the receive position, the radio will receive any other controller intercom messages. Rotating the volume control will adjust the audio level for the individual station.

If the intercom has not been used for 3 minutes, the radio will revert back to normal radio operations. To exit intercom operations before the end of the 3 minutes, press **ENT**.

2:45 47° 47N 122° 19W

CH 403

1=MORE	2=NB	3=CELL
4=LOW	5=DIM	6=ALRM
7=STOR	8=SCAN	9=TXF


2:45 47° 47N 122° 19W

CH 403

1=PREV	2=ITCM	3=SCMD
4=BRWS	5=AMTR	6=CFG
7=BEEP	8=NAME	9=VER

2:45 47° 47N 122° 19W

INTERCOM



CHANGING THE SQUELCH THRESHOLD

Press **RADIO** **1**^{SP} **6**^{MNO} for the radio configuration menu.

Press **1**^{SP} to adjust the squelch threshold.

Use the **UP** or **DN** keys to change the squelch threshold setting, or use the numeric keys to enter a setting between 1 and 15 directly. Press **ENT** to select the setting.

A larger number will require a stronger signal to open the squelch.

2:45 47° 47N 122° 19W

CH 403

1=MORE	2=NB	3=CELL
4=LOW	5=DIM	6=ALRM
7=STOR	8=SCAN	9=TXF

2:45 47° 47N 122° 19W

CH 403

1=PREV	2=ITCM	3=SCMD
4=BRWS	5=AMTR	6=CFG
7=BEEP	8=NAME	9=VER

2:45 47° 47N 122° 19W

CH 403

1=SQL	2=TUNR	3=UNIT
4=AGC	5=VOGD	

SELECT PARAMETER <1

2:45 47° 47N 122° 19W

CH 403

SQL THRESHHOLD: 5

CHANGING THE TUNER STATUS

Press **RADIO** **1**^{SP} **6**^{MNO} for the radio configuration menu.

Press **2**^{ABC} to toggle the tuner status.

Select “TUNR” when the radio will be used with an SEA 1612C or 1631 antenna tuner. The “LOW” indicator will appear on the display to show the antenna is not tuned for full output power. The tuner will perform a “tune” when the operator does one of the following:

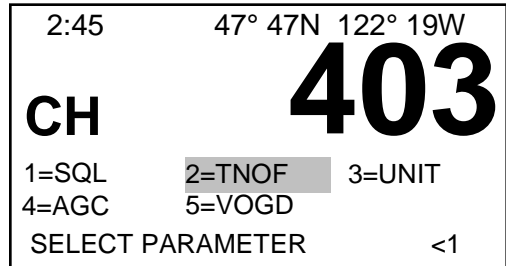
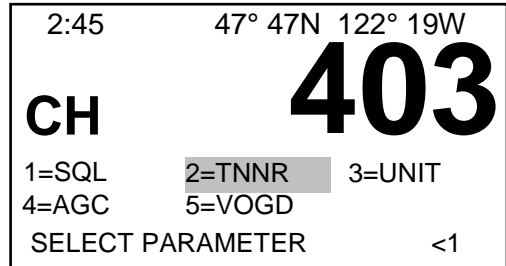
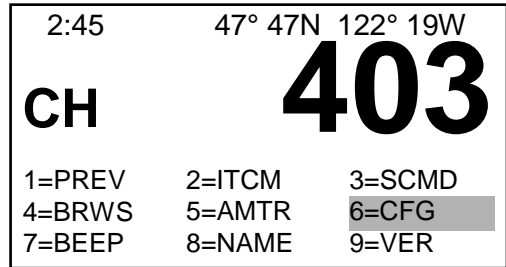
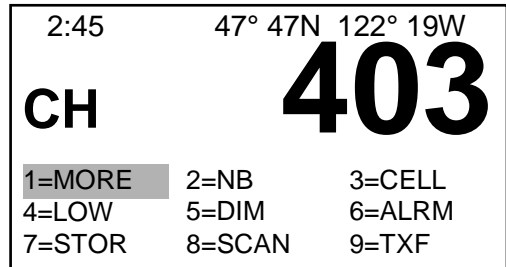
- 1) Speaks into the microphone during transmit
- 2) Holds the microphone PTT and presses the **MODE** **←BKSP** key. The radio will output a signal to “match” the antenna.

When the tuner has finished matching the antenna, the “HI” power indicator will turn on and the radio will transmit at full power.

Select “TNOF” when using a tuner that does not supply a ground potential “TND” signal.

Pressing the **MODE** **←BKSP** key while the PTT is held will not transmit a signal for tuning the antenna.

NOTE: *If the operator has set the radio to “LO PWR” or “VLO PWR” via the radio menu, and the tuner has found a “match”, the radio will not increase to full power until the operator manually changes the output power to “HI PWR”.*



CHANGING THE CONTROLLER UNIT NUMBER

Press **RADIO** **1** **6** for the radio configuration menu.

Press **3** to select the controller unit number.

Use the **UP** or **DN** keys to change the number setting, or use the numeric keys to enter a setting directly. Press **ENT** to select the setting.

The default controller number is “1”. The unit number can be changed from 1 to 9.

Each controller must be assigned a different number.

Only one mic at a time can transmit, first-come-first served, so please wait until “TX” is not lit in the display before trying to transmit any call types including DISTRESS key, DSC, TELEX, or modem calls.

Sidetone volume is useful for monitoring another Unit’s Tx. This allows conference calls as long as each mic un-keys before another Unit’s mic keys for Tx.

2:45 47° 47N 122° 19W

CH 403

1=MORE	2=NB	3=CELL
4=LOW	5=DIM	6=ALRM
7=STOR	8=SCAN	9=TXF

2:45 47° 47N 122° 19W

CH 403

1=PREV	2=ITCM	3=SCMD
4=BRWS	5=AMTR	6=CFG
7=BEEP	8=NAME	9=VER

2:45 47° 47N 122° 19W

CH 403

1=SQL	2=TUNR	3=UNIT
4=AGC	5=VOGD	
SELECT PARAMETER		<1

2:45 47° 47N 122° 19W

CH 403

SQL THRESHHOLD: 1

CHANGING THE SSB AGC CHARACTERISTICS

The SSB AGC controls the radio’s receiver gain when receiving non TELEX mode signals. The characteristics may be changed to one of four settings numbered “0”, “1”, “2” and “3”. Settings “0” and “1” use feedforward AGC. Feedforward AGC is an aggressive AGC system that is very noise immune and keeps the audio level fairly constant for received signals of different strength. The difference between setting “0” and “1” is the decay rate or amount of time the signal fades away. Settings “2” and “3” use the same decay rates as “0” and “1” but do not use feedforward AGC. When the feedforward AGC is disabled the receiver will sound more like a conventional SSB receiver.

Press **RADIO** **1**^{SP} **6**^{MNO} for the radio configuration menu.

Press **4**^{GHI} to select the SSB AGC characteristic.

Use the **UP** or **DN** keys to change the current setting, or use the numeric keys to enter a setting directly. Press **ENT** to select the setting.

Use a setting of “0” (default) or “1” for better signal-to-noise ratio on weaker signals.

Use a setting of “2” or “3” for a more conventional sounding SSB receiver.

2:45 47° 47N 122° 19W
CH 403
 1=MORE 2=NB 3=CELL
 4=LOW 5=DIM 6=ALRM
 7=STOR 8=SCAN 9=TXF

2:45 47° 47N 122° 19W
CH 403
 1=PREV 2=ITCM 3=SCMD
 4=BRWS 5=AMTR 6=CFG
 7=BEEP 8=NAME 9=VER

2:45 47° 47N 122° 19W
CH 403
 1=SQL 2=TUNR 3=UNIT
 4=AGC 5=VOGD
 SELECT PARAMETER <1

2:45 47° 47N 122° 19W
CH 403
 PRESS MODE FOR TLX AGC
 SSB AGC: 0

CHANGING THE TELEX AGC CHARACTERISTICS

The TLX AGC controls the radio's receiver gain when receiving TELEX mode signals. The characteristics may be changed to one of four settings numbered "0", "1", "2" and "3". Settings "0" and "1" use feedforward AGC. Feedforward AGC is an aggressive AGC system that is very noise immune and keeps the audio level fairly constant for received signals of different strength. The difference between setting "0" and "1" is the decay rate or amount of time the signal fades away. Settings "2" and "3" use the same decay rates as "0" and "1" but do not use feedforward AGC. Some forms of TELEX such as "CLOVER" require settings "2" or "3" to properly receive the signal. Refer to the data provided by the specific MODEM manufacturer.

Press **RADIO** **1**^{SP} **6**^{MNO} for the radio configuration menu.

Press **4**^{GHI} **MODE**^{←BKSP} to select the TLX AGC characteristic.

Use the **UP** or **DN** keys to change the current setting, or use the numeric keys to enter a setting directly. Press **ENT** to select the setting.

Use a setting of "0" (default) or "1" for better signal to noise ratio on weaker signals.

Use a setting of "2" or "3" for a more complex TELEX modulation method.

2:45	47° 47N 122° 19W	
CH	403	
1=MORE	2=NB	3=CELL
4=LOW	5=DIM	6=ALRM
7=STOR	8=SCAN	9=TXF

2:45	47° 47N 122° 19W	
CH	403	
1=PREV	2=ITCM	3=SCMD
4=BRWS	5=AMTR	6=CFG
7=BEEP	8=NAME	9=VER

2:45	47° 47N 122° 19W	
CH	403	
1=SQL	2=TUNR	3=UNIT
4=AGC	5=VOGD	
SELECT PARAMETER		<1

2:45	47° 47N 122° 19W
CH	403
PRESS MODE FOR SSB AGC	
TLX AGC: 0	

CHANGING THE VOGAD CHARACTERISTICS

Press **RADIO** **1**^{SP} **5**^{J K L} for the radio configuration menu.

Press **5**^{J K L} to select the VOGAD characteristic..

Use the **UP** or **DN** keys to change the current setting, or use the numeric keys to enter a setting directly. Press **ENT** to select the setting.

The VOGAD parameters are used for the transmit signal. Very similar to the receiver AGC settings, the normal VOGAD setting is “0”. It should not be necessary to change this setting unless instructed to do so by the factory.

The valid settings are “0”, “1”, “2” and “3”.

2:45 47° 47N 122° 19W

CH 403

1=MORE	2=NB	3=CELL
4=LOW	5=DIM	6=ALRM
7=STOR	8=SCAN	9=TXF

2:45 47° 47N 122° 19W

CH 403

1=PREV	2=ITCM	3=SCMD
4=BRWS	5=AMTR	6=CFG
7=BEEP	8=NAME	9=VER

2:45 47° 47N 122° 19W

CH 403

1=SQL	2=TUNR	3=UNIT
4=AGC	5=VOGD	

SELECT PARAMETER <1

2:45 47° 47N 122° 19W

CH 403

VOGAD SETTING: 1

SELECTING 2182 OR LAST CHANNEL FOR DEFAULT

Press **RADIO** **1**^{SP} **6**^{MNO} for the radio configuration menu.

Press **6**^{MNO} to select the default channel characteristic between 2182 or LAST channel selected as the power-up default channel.

A USERFRQ must be stored to a bin number in order to be a default last channel.

2:45	47° 47N 122° 19W
CH	403
1=MORE	2=NB 3=CELL
4=LOW	5=DIM 6=ALRM
7=STOR	8=SCAN 9=TXF

2:45	47° 47N 122° 19W
CH	403
1=PREV	2=ITCM 3=SCMD
4=BRWS	5=AMTR 6=CFG
7=BEEP	8=NAME 9=VER

2:45	47° 47N 122° 19W
CH	403
1=SQL	2=TUNR 3=UNIT
4=AGC	5=VOGD 6=2182
7=SSP2	8=TLDB

SELECTING VOICE INPUT CONNECTION

Press **RADIO** **1**^{SP} **6**^{MNO} for the radio configuration menu.

Press **7**^{PRS} to select the default Voice characteristic between microphone **SSMC** or **SSP2** for the single side band voice bandwidth input.

This allows convenient connection of an external modem to the **TXAF** port of P2 on the rear panel of the transceiver.

2:45	47° 47N	122° 19W
CH	403	
1=MORE	2=NB	3=CELL
4=LOW	5=DIM	6=ALRM
7=STOR	8=SCAN	9=TXF

2:45	47° 47N	122° 19W
CH	403	
1=PREV	2=ITCM	3=SCMD
4=BRWS	5=AMTR	6=CFG
7=BEEP	8=NAME	9=VER

2:45	47° 47N	122° 19W
CH	403	
1=SQL	2=TUNR	3=UNIT
4=AGC	5=VOGD	6=2182
7=SSMC	8=TLDB	

SELECTING TELEX INPUT CONNECTION

Press **RADIO** **1**^{SP} **6**^{MNO} for the radio configuration menu.

Press **8**^{TUV} to select the default Telex Characteristic between microphone **TLMC** or **TELEX** modem **TLP2**, **TXAF** port of P2 on the Rear panel of the transceiver.

2:45	47° 47N 122° 19W
CH	403
1=MORE	2=NB 3=CELL
4=LOW	5=DIM 6=ALRM
7=STOR	8=SCAN 9=TXF

2:45	47° 47N 122° 19W
CH	403
1=PREV	2=ITCM 3=SCMD
4=BRWS	5=AMTR 6=CFG
7=BEEP	8=NAME 9=VER

2:45	47° 47N 122° 19W
CH	403
1=SQL	2=TUNR 3=UNIT
4=AGC	5=VOGD 6=2182
7=SSMC	8=TLP2

THE RADIO AMATEUR OPERATING SYSTEM

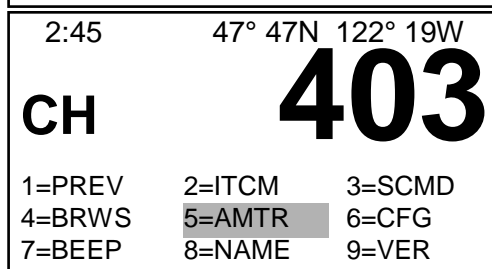
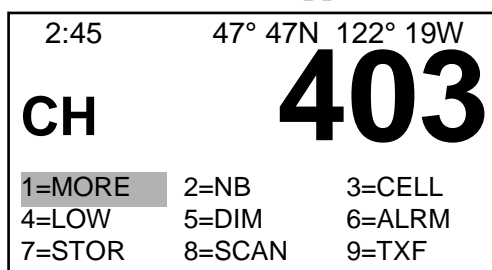
Primarily designed to be used in marine applications, the SEA 245 may also be used as an amateur radio transceiver. When power is first applied to the radio, the MARINE operating system is automatically started. Due to the stringent operating requirements used for marine operations, this mode is very restrictive for a licensed amateur radio operator working the ham bands.

An additional feature of the SEA 245 is a special operating function known as the AMATEUR operating system. This mode of operation gives the user more flexibility by allowing the clarifier to operate beyond the ± 200 Hz limit required in the MARINE mode. Additionally, the ability to have the transmit frequency track the receive frequency at any time allows a “dial around” approach more commonly used for the amateur bands.

Press **RADIO** **1**^{SP} **5**^{J K L} to select the AMATEUR operating system.

The AMATEUR mode differs from the MARINE in the following ways:

- 1) ITU/SEA channels are not valid. Bin selections are allowed.
- 2) “Direct Frequency” entry mode is always enabled.
- 3) Frequencies entered below 10 MHz will default to LSB while frequencies entered above 10 MHz will default to USB.
- 4) All operating modes except TRUE AM are available for transmit.
- 5) The R.I.T. (clarifier) limit restrictions are removed and may be changed to 10 Hz, 100 Hz, 1 KHz or 10 KHz step sizes by pressing the numeric 1,2,or 3 keys followed by up or down arrow key.
- 6) When the transmit and receive frequencies are locked as indicated on the display, the transmit frequency will use the same frequency as receive. The clarifier will move both simultaneously. When the frequencies are not locked together, the clarifier will only affect the receive frequency. The CH/FREQ key must be pressed before PTT in order to lock a transmit frequency to a clarified receive frequency.
- 7) Pressing the microphone PTT will unlock the two frequencies.
- 8) Pressing **CH**/**FX** will lock the two frequencies together.



Pressing the **0** ^{Q Z} ₂₁₈₂ key, or **RADIO** **1** ^{SP} **5** ^{J K L}, or cycling the power will return the radio to the MARINE operating system.

CHANGING THE BEEP

An audible tone will be heard whenever a key is pressed. The key beep may be turned on or off by pressing the **RADIO** key followed by the **1** ^{SP} key.

Press **7** ^{P R S} to toggle the beep control setting.

2:45	47° 47N 122° 19W	
CH	403	
1=PREV	2=ITCM	3=SCMD
4=BRWS	5=AMTR	6=CFG
7=BEEP	8=NAME	9=VER

CHECKING THE SOFTWARE VERSION

The radio's software version is shown on the display at power up. A more detailed version check may be displayed by pressing the key **RADIO** followed by the **1** ^{SP} and **9** ^{W X Y} keys.

The version number, release date, serial number and checksum will be shown on the first screen. This information may be helpful in determining what options are available in the radio.

If the **ENT** key is pressed within 1 minute, the second screen will show the DSC ID and Group DSC ID currently programmed.

Pressing the **ENT** key or waiting 1 minute will return the radio to normal operations.

2:45	47° 47N 122° 19W	
CH	403	
1=PREV	2=ITCM	3=SCMD
4=BRWS	5=AMTR	6=CFG
7=BEEP	8=NAME	9=VER

245	VER 1.00
29 FEB 2000	
SERNO: EX01047	
CHECKSUM: 2D73	
PRESS ENT FOR MORE	

DSCID: 123456789
GRPID: 111222333
NECODE TX: 12 111222333
NECODE RX: 1234 11222333
PRESS ENT TO EXIT

DSC PROGRAMMING

Several DSC settings should be programmed during installation. These settings are accessed from the DSC program menu by pressing **DSC** **2** ^A_B_C.

The DSC program menu has four selections:

Unit Setup is the group of program settings used for diagnostics and initial settings.

DSC Stations is used for programming a list of DSC stations that will be called frequently.

Phone Numbers is used for programming a list of frequently called phone numbers.

Position allows the Latitude / Longitude to be input from the front panel.

When these parameters are programmed before placing a call, the possibilities of errors being made and the amount of time required to place the call are greatly reduced.

2:45	47° 47N 122° 19W
CH 1206	TLX
1=REVIEW	2=PROGRAM
3=DSC	4=ALT CHAN
5=RELAY	6=ALL SHIP
7=PHONE	8=CLASS A

Primary DSC menu selections

2:45	47° 47N 122° 19W
12245.0	TLX
1=UNIT SETUP	
2=DSC STATIONS	
3=PHONE NUMBERS	
4=POSITION	

2=Program

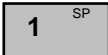
2:45	47° 47N 122° 19W
12245.0	TLX
1=TIME	2=DSC ID
3=NAVIGATION	
4=OPTIONS	
5=UTILITIES	

1=Unit Setup menu

SETTING THE DATE & TIME


To program the current date and time, press



The current date and time will be displayed. If a change is needed, press .

Prompts will appear for the year, month, day, hours and minutes. Use the number keys or the

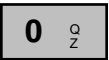


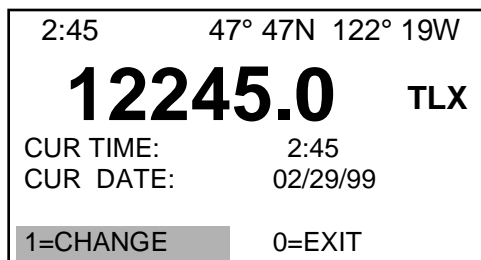
keys to change the default value. Press the  key to accept the displayed value.

After the correct date and time have been entered, the operator is prompted to press the

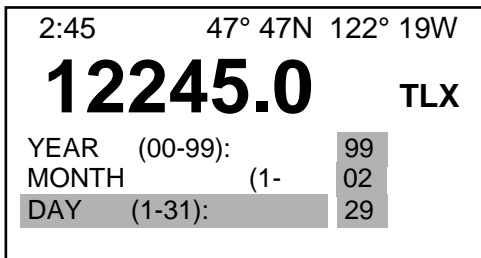


key to start the clock with the new

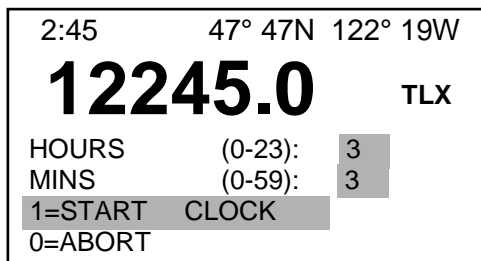
settings or  to abort and use the previous values.



Current Date and Time



Entering correct date



Entering correct time

PROGRAMMING THE DSC ID (MMSI)

It is not possible to compose or transmit a DSC call until the MMSI ID is programmed. Issued by the FCC, this number is unique for every vessel. If the ID has never been programmed, the operator will be prompted to do so when the radio is turned on or when an attempt to compose a DSC message is made.

To program the MMSI ID press **DSC** **2** **1** **2**.

The current MMSI number will be shown and the number of times the number may be changed. The number may only be entered twice by the operator. If the number must be changed after being entered twice, contact an authorized SEA GMDSS dealer for service.

The group DSC ID number may be changed at any time and is selected by the group of stations using the group number. When several stations share the same group number, a single call may be transmitted to all of the stations by using the group number.

The current group number is shown after the current MMSI number is displayed. The operator is prompted to change the group ID number and confirm the new number is correct.

3:03 47° 47N 122° 19W
12245.0 TLX
 1=TIME 2=DSC ID
 3=NAVIGATION
 4=OPTIONS
 5=UTILITIES

1=Unit Setup menu

3:03 47° 47N 122° 19W
12245.0 TLX
 CUR MMSI: 123456789
 May change 0 times
 1=CHANGE 0=NO

MMSI ID change

3:03 47° 47N 122° 19W
12245.0 TLX
 CUR GROUP: 111222333
 1=CHANGE 0=NO

Group MMSI ID change

3:03 47° 47N 122° 19W
12245.0 TLX
 CUR GROUP: 111222333
 NEW GROUP: 111222333
 1=CONFIRM 0=ABORT

Group MMSI ID change

PROGRAMMING THE NAVIGATION INTERFACE

To program the navigation interface press

DSC
2 A
B
C
1 SP
3 D
E
F

Select 1 SP if external NMEA 0183 is present. If no external data is available press

2 A
B
C or 0 Q
Z to use the current setting.

The sentence formats recognized by the radio for navigational input are:

- NMEA 0183** Version 2.00
- RMC** (minimum GPS/TRANSIT specific data)
- GGA** (GPS fix)
- GLL** (position independent of the source)

3:03	47° 47N 122° 19W
12245.0	TLX
1=TIME	2=DSC ID
3=NAVIGATION	
4=OPTIONS	
5=UTILITIES	

I=Unit Setup menu

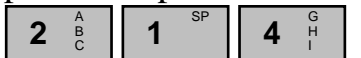
3:03	47° 47N 122° 19W
12245.0	TLX
Is NMEA 0183 Nav Equipment Connected?	
1=YES	2=NO
0=EXIT	1

Navigational equipment connected

PROGRAMMING OPTIONS

DSC program options allow the operator to set the amount of time an audible alarm will sound when a routine call is received and if an alarm should warn the operator when poll or position calls are received.

To program the audible alarm time and disable poll and position call alarms, press **DSC**



The alarm time may be set from 2 to 20 minutes. Pressing a key while the alarm is sounding will stop the alarm before the alarm time has expired

3:03 47° 47N 122° 19W
12245.0 TLX
 1=TIME 2=DSC ID
 3=NAVIGATION
4=OPTIONS
 5=UTILITIES

1=Unit Setup menu

3:04 47° 47N 122° 19W
12245.0 TLX
 ROUTINE CALL
 AUDIBLE ALRM TIME
 4 MINUTES
 NEW TIME (2-20): 5

Audible alarm time

3:02 47° 47N 122° 19W
12245.0 TLX
 SUPPRESS ALARM FOR
 POLL/POSITION CALLS
 1=YES 2=NO

Alarms when Poll or Position calls received

USING TEST AND DIAGNOSTIC UTILITIES

The DSC utilities menu may be accessed by



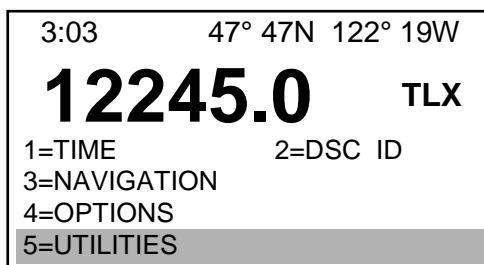
The various alarm tones may be tested by

pressing .

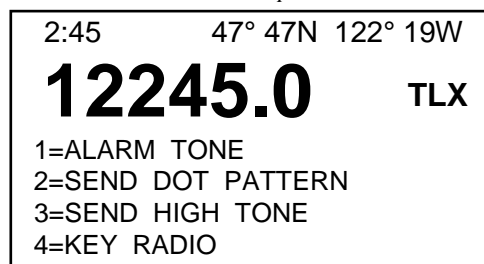
Pressing will send or stop a dot pattern being sent to the modulator circuit.

Pressing will send the high or low FSK tones to the modulator circuit. The tones may also be turned off.

Pressing will key and unkey the transmitter.



1=Unit Setup menu



5=Utilities Menu

PROGRAMMING THE DSC DIRECTORY

The DSC directory is an address book containing 49 of the operator's most frequently called DSC stations.

To add or modify a DSC directory entry,

press **DSC** **2** **2** .

Locate the name of the station by pressing

the **UP** or **DN** keys then the number next to the name. If this is a new entry, press a number that does not have a station name next to the number.

ENT prompt, enter a descriptive name of 9

characters or less in length. The **MODE** **←BKSP** key may be used to backspace over existing characters while the alphanumeric characters

are selected by using the **UP** and **DN** keys to cycle through each character on the key. If

the **MODE** **←BKSP** key is not the first key pressed when an existing name is displayed, the

entire name will be erased. Press the **ENT** key to complete the name entry.

Enter the 9 digit MMSI ID number associated with the descriptive (boat) name

just entered and press **ENT** . Press **1** ^{SP}

or **ENT** to confirm, **0** ^O/_Z to abort.

2:45 47° 47N 122° 19W

12245.0

TLX

1=REVIEW	2=PROGRAM
3=DSC	4=ALT CHAN
5=RELAY	6=ALL SHIP
7=PHONE	8=CLASS A

Primary DSC menu selections

2:45 47° 47N 122° 19W

12245.0

TLX

1=UNIT SETUP	2=DSC STATIONS
3=PHONE NUMBERS	4=POSITION

2=Program

1=ABOVE H2O
2=BLACKDUCK
3=BOBBINRND
4=H2O TOYS
5=MY DREAM
6=INDPENDEN
7=TEST STAT
UP/DN, 1-7=MODIFY

2=DSC Stations

ENTER NAME: ABOVE H2

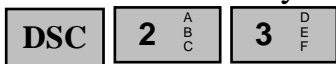
ENTER MMSI: 999888765

DSC directory entry

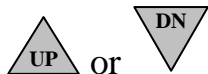
PROGRAMMING THE TELEPHONE DIRECTORY

The telephone directory is an address book containing 49 of the operator's most frequently called telephone numbers.

To add or modify a telephone entry, press



Locate the name of the phone number with the



keys then the number next to the name. If this is a new entry, press a number that does not have a name next to the number.

ENT prompt, enter a descriptive name of 9

characters or less in length. The **MODE** **← BKSP** key may be used to backspace over existing characters while the alphanumeric characters

are selected by using the **UP** and **DN** keys to cycle through each character on the key. If

the **MODE** **← BKSP** key is not the first key pressed when an existing name is displayed, the entire name will be erased. Press the **ENT** key to complete the name entry.

Enter the telephone number of up to 16 characters associated with the descriptive name just entered and press **ENT**.

2:45 47° 47N 122° 19W
12245.0 TLX
 1=REVIEW 2=PROGRAM
 3=DSC 4=ALT CHAN
 5=RELAY 6=ALL SHIP
 7=PHONE 8=CLASS A

Primary DSC menu selections

2:45 47° 47N 122° 19W
12245.0 TLX
 1=UNIT SETUP
 2=DSC STATIONS
3=PHONE NUMBERS
 4=POSITION

2=Program

1=MAIN OFF
 2=HOME
 3=LBOWROOM
 4=ENG REPAR
 5=ELEC REPR
6=SEA
 7=
 UP/DN, 1-7=MODIFY

2=DSC Stations

ENTER NAME: SEA
 PH#: NO-NUMBER

Phone Number Entry

INPUTTING POSITION DATA

When power is applied to the radio, the NMEA 0183 input is checked for positioning information. If the data is not present or invalid, the radio will prompt for positioning data 15 seconds after power is applied.

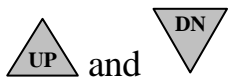
If the operator does not enter a position, the radio will sound an alarm and prompt for a valid position every 20 minutes. Manually entering a valid position will suppress the alarm.

When the position is entered manually and no NMEA 0183 positioning information is present, the radio will sound an alarm 4 hours after the last position was input and prompt the operator to enter the current position.

To program a valid current position into the radio, press **DSC** **2** **2** **1** .

The operator is prompted for the global quadrant for the following Latitude and Longitude position. Select the quadrant.

When prompted for the degrees and minutes of the latitude and longitude, use the numeric or



keys to change the value.

After the correct value is displayed press **ENT**.

The **MODE** **←BKSP** key may be used to backspace over the digit just entered for corrections.

NOTE: A manual position entry will be ignored when external NMEA position data is present.

2:45 47° 47N 122° 19W

12245.0 TLX

1=REVIEW 2=PROGRAM
3=DSC 4=ALT CHAN
5=RELAY 6=ALL SHIP
7=PHONE 8=CLASS A

Primary DSC menu selections

2:45 47° 47N 122° 19W

12245.0 TLX

1=UNIT SETUP
2=DSC STATIONS
3=PHONE NUMBERS
4=POSITION

2=Program

2:45 NO-NAV-DATA

12245.0 TLX

POSITION KNOWN?

1=YES 2=NO <1

4=Position selection

2:55 NO-NAV-DATA

12245.0 TLX

SELECT QUADRANT

0=NE 1=NW
2=SE 3=SW

Global quadrant location

2:45 NO-NAV-DATA

12245.0 TLX

QUADRANT: NW
LATITUDE: 47° 47'
LONGITUDE: 122°
MINUTES(0-59'): 19

Latitude / Longitude in degrees and minutes

DSC DISTRESS CALLING

A distress DSC call may be transmitted by using the following method.

When equipped with a protective cover, lift the cover to expose the **DISTRESS** key.

Press and hold the **DISTRESS** key for 5 seconds. An alert tone will sound while the key is held.

Select from the list of available distress conditions shown. If the condition is not shown, press the **UP** key for more selections.

After selecting the type of distress, press the **DSC** key to transmit the DSC emergency.

If the radio is not supplied with positioning information from NMEA183/GPS, follow the prompts to input a Lat/Long position.

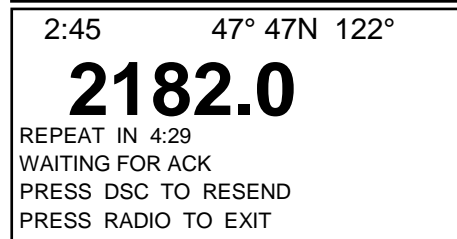
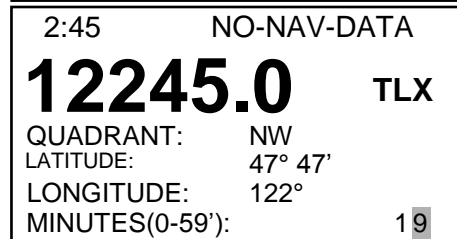
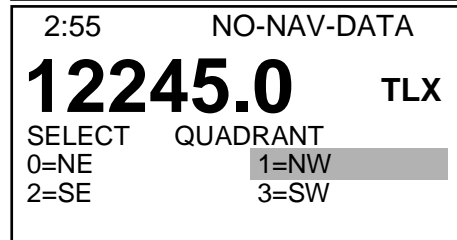
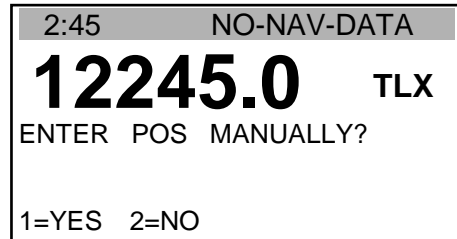
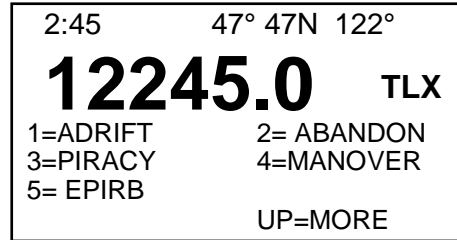
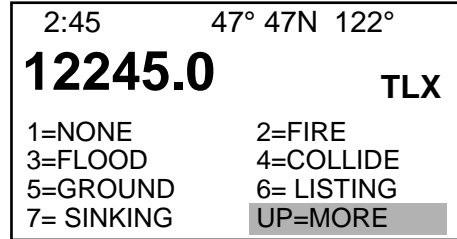
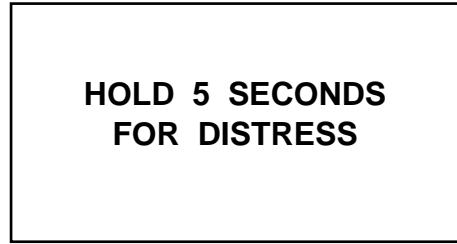
After entering the position manually and pressing the **ENT** key, you are prompted to press the **DSC** key to transmit the DSC emergency on DSC frequency 2187.5 kHz.



The radio will also switch to the associated voice distress channel (2182 kHz).

The radio will wait for an acknowledgment from the coast station and automatically resend the DSC distress approximately every 4 minutes if a coast station does not respond.

You may press the **DSC** key to resend the emergency again or press the **RADIO** key to exit the DSC emergency.



SELECTING THE DSC MENU

Pressing the **DSC** key will bring up the primary DSC menu. The menu selections available are used for reviewing received calls, programming station Ids, and transmitting the different DSC formats. Please see the individual sections for complete details.

Most calls will conform to one of the five predefined formats which have a simplified calling procedure:

Routine individual and test calls may be selected with **DSC** **3** ^D/_F.

Necode calls are selected with **DSC** **4** ^G/_{H I}.

Distress relay calls may be placed with **DSC** **5** ^J/_{K L}.

If a call is to be placed to **all ships** for warning purposes, use **DSC** **6** ^M/_{N O}.

DSC **7** ^P/_{R S} allows placing a **telephone call** through an operator.

8 ^T/_{U V} those calls that do not fit one of the mentioned categories, **DSC** will allow the operator to compose **CLASS A** formats. Class A formats allow all call types to be generated, including geographic area calls, group calls, non-voice (fax and data) calls, position requests, and polls.

The **RADIO** key may be used to abort the DSC call at any point in the process and return to the main radio display.

2:45 47° 47N 122° 19W
CH 451
 1=REVIEW 2=PROGRAM
 3=DSC 4=NECODE
 5=RELAY 6=ALL SHIP
 7=PHONE 8=CLASS A

Primary DSC menu selections

2:56 47° 47N 122° 19W
4205.00
 LAST STATION CALLED 123456789
 CALL SAME STATION?
 1=YES 2=NO

3=individual call or 7=Phone call

2:56 47° 47N 122° 19W
4205.00
 LAST STATION CALLED 1234
 CALL SAME STATION?
 1=YES 2=NO

4=Necode call

2:45 47° 47N 122° 19W
4205.00
 SEND RELAY TO
 1= ALL SHIPS
 2=INDIVIDUAL

5=Distress relay call

4205.00
 1=ROUTINE 2=SAFETY
 3=URGENCY 4=DISTRESS

6=All ships call

2:45 47° 47N 122° 19W
4205.00
 1=DSTRESS 2=ALLSHIPS
 3= GEOAREA 4=INDIVIDL
 5=GROUP 6=PHONE

8=Class A call screen

ROUTINE INDIVIDUAL AND TEST DSC CALLS

A routine individual call is used to address another station, either ship or coast. You should tune the radio to the WORKING frequency prior to initiating the call. If DSC mode is selected after a FREQUENCY is entered and ‘RADIO , 9’ keys are pressed for also entering the Tx frequency.

To transmit a routine individual or test call, press **DSC** **3** ^D_M.

If you are calling the same station shown on the screen, simply press **1** ^{SP}.

If you do not want to call the same station shown on screen, press **2** ^A_B_C and select the station name by pressing the **UP** or **DN** keys to select from one of the seven lists containing the names. You may also enter the number directly by pressing **0** ^Q_Z ₂₁₈₂.

You are then prompted for extra information related to the call. Select 1 or 2 if the call is being made on the desired working channel. 2 will include position information in the call. Select 3 to select a calling channel. Select 4 for a test call.

If you request an alternate calling channel, the working channel information will be included in the call. If the working channel is not an ITU channel it will be sent as a frequency pair for compatibility with radios that may number the channels differently.

When prompted to ‘ENTER DSC CALLING CHANNEL’, select a channel using the **UP** and **DN** keys and/or the numeric keys. The **MODE** **← BKSP** key may be used to choose the channel mode although DSC would be used typically.

2:45 47° 47N 122° 19W

CH 451

1=REVIEW	2=PROGRAM
3=DSC	4=NECODE
5=RELAY	6=ALL SHIP
7=PHONE	8=CLASS A

Primary DSC menu selections

2:56 47° 47N 122° 19W

CH 451

LAST STATION CALLED
123456789

CALL SAME STATION?
1=YES 2=NO

3=Routine individual call

1=ABOVE H2O
2=BLACKDUCK
3=BOBBINRND
4=H2O TOYS
5=MY DREAM
6=INDPENDEN
7=TEST STAT
UP/DN, 1-7, 0=DIRECT

Nine character names assigned to MMSI numbers

2:45 47° 47N 122° 19W

CH 451

1=NO OTHER INFO
2=INCLUDE POSITION
3=ALT CALLING CHAN/FREQ
4=TEST CALL

2:45 47° 47N 122° 19W

CH 451

2:45 47° 47N 122° 19W

ENTER DSC CALLING CHANNEL:
401 DSC

NECODE CALLS

A Nocode call uses a simplified protocol. Only address information is exchanged. Calls are always made on the working channel.

To transmit a Nocode call press **DSC** **4** ^G_H_I.

Select the station you wish to call from one of seven stored lists or enter the number directly when prompted. If you are calling the same station shown on the screen, simply press

1 ^{SP}

2:45 47° 47N 122° 19W

CH 451

1=REVIEW	2=PROGRAM
3=DSC	4=NECODE
5=RELAY	6=ALL SHIP
7=PHONE	8=CLASS A

Primary DSC menu selections

2:56 47° 47N 122° 19W

CH 451

LAST STATION CALLED

1234

CALL SAME STATION?

1=YES 2=NO

Station to call

1=ABOVE H2O
 2=BLACKDUCK
 3=BOBBINRND
 4=H2O TOYS
 5=MY DREAM
 6=INDPENDEN
 7=TEST STAT
 UP/DN, 1-7, 0=DIRECT

Nine character tags assigned to Nocode numbers

DSC DISTRESS RELAY CALLS

Normally, DSC distress calls are handled by coast stations. In some cases, however, a coast station may not receive a DSC call, a ship in distress may not be equipped with DSC or the ship in distress may be unable to make a call. If this is the case, a distress relay call may be used to report another vessel in distress.

To transmit a distress relay call on 2187.5 kHz,

press **DSC** **5** ^J_K^L.

Press **1** ^{SP} to transmit to all ships or to

2 ^A_B^C transmit an individual call (normally a nearby coast station). If an individual call is desired, select the station you are calling. When prompted, press the **DSC** key to transmit the call.

Care should be taken when sending relay calls for another ship in distress. If you are not certain that the coast station did not receive the original distress call, use voice communications to relay the distress.

2:45	47° 47N 122° 19W
CH 451	
1=REVIEW	2=PROGRAM
3=DSC	4=NECODE
5=RELAY	6=ALL SHIP
7=PHONE	8=CLASS A

Primary DSC menu selections

2:45	47° 47N 122° 19W
CH 451	
SEND RELAY TO	
1= ALL SHIPS	
2=INDIVIDUAL	

5=Distress relay call

ALL SHIPS DSC CALLS

To call all ships within radio range use an all ships call. Most frequently this is used by coast stations to initiate navigational warnings, weather reports and similar matters of interest to all mariners.

To transmit an all ships DSC call, press



DSC

Select a priority category at the prompt.

Routine indicates normal priority.

Safety indicates important navigational or meteorological warning.

Urgency relates to safety of life or property.

Distress is grave and imminent danger to life and property with immediate assistance required.

The call will be sent on the default DSC channel in the currently selected band.

2:45	47° 47N 122° 19W
CH 451	
1=REVIEW	2=PROGRAM
3=DSC	4=NECODE
5=RELAY	6=ALL SHIP
7=PHONE	8=CLASS A

Primary DSC menu selections

2:45	47° 47N 122° 19W
CH 451	
1=ROUTINE	2=SAFETY
3=URGENCY	4=DISTRESS

6=All ships call

PLACING A TELEPHONE CALL WITH DSC

DSC may be used to set up a telephone call through an appropriately equipped coast station. First tune to the coast station's calling frequency.

To initiate a phone call, press **DSC** **7** p r s.

If you are calling the same station shown on the display, simply press **1** SP.

Using the **UP** and **DN** keys, select a phone number from one of the seven stored lists followed by a numeric key and **ENT**.

If the phone number identity is not listed, press **0** Q Z 2182 to enter the phone number directly.

Press the **DSC** key to transmit the call on the currently selected channel.

The radio will change to the working channel assigned by the coast station's acknowledgment. See CLASS A section of Operator's Manual for details of ALT CHN and ALT FRQ selection.

2:45	47° 47N 122° 19W
4205.00	DSC
1=REVIEW	2=PROGRAM
3=DSC	4=NECODE
5=RELAY	6=ALL SHIP
7=PHONE	8=CLASS A

Primary DSC menu selections

2:56	47° 47N 122° 19W
CH 401	DSC
LAST STATION CALLED	
	123456789
CALL SAME STATION?	
1=YES 2=NO	

7=Phone call

1=MAIN OFF
2=HOME
3=LBOWROOM
4=ENG REPAR
5=ELEC REPR
6=SEA
7=
UP/DN, 1-7, 0=DIRECT

Phone number identities

PH: 4257712182
TO: 123456789
NO MESSAGE INFO
ACK REQUESTED
COM-REQ: J3E
TC2: NO-INFO
PRESS DSC TO XMIT

Directly entering phone number

RECEIVING A DSC CALL

Under most circumstances, received calls are displayed immediately.

An alarm tone will sound to alert the operator of the received call. Pressing a key stops the alarm.

The information displayed will depend on the nature of the received call. If the MMSI number is not recognized from the list of programmed DSC ID's, the MMSI number will be displayed rather than the name.

The radio will automatically change to the requested channel for further communications.

```
#1 DISTRESS CALL
from 987654321
NO-TIME 7/24/00
POS: NOT-GIVEN
NATURE: NOT-GIVEN
ACK-BY-PHONE: 2182.0
```

Distress call message

```
#1 INDIVIDUAL
from ABOVE H20
03:01 11/11/00
CHANNEL 451
NO-ERRS ACK
COM-REQ: J3E VOICE
TC2: NO-INFO
```

Routine call message

REVIEWING THE DSC CALL LOGS

Press the **DSC** key followed by **1**^{SP} to review the call logs.

Press **2**^{A B C} to review distress calls or **1**^{SP} to review all other calls. The last 40 calls in each category are stored.

It is possible to respond to the displayed entry by pressing the **DSC** key.

The messages are displayed with information particular to the format type of the message.

Each line of a GEOAREA, INDIVIDUAL, GROUP, ALL SHIPS and UNKNOWN message have the following information displayed:

- Line 1 Message number and category
- Line 2 Received from MMSI number
- Line 3 UTC Time / Date (when call received)
- Line 4 Channel / Frequencies / Position
- Line 5 ERRORS / Status (ACK, NOACK)
- Line 6 TC1 (telecommand 1)
- Line 7 TC2 (telecommand 2)

Each line of a PHONE CALL message contains:

- Line 1 Message number and phone number
- Line 2 Received from MMSI number
- Line 3 UTC Time / Date (when call received)
- Line 4 Call duration / Channel / Frequencies / Position
- Line 5 ERRORS / Status (ACK, NOACK)
- Line 6 TC1 (telecommand 1)
- Line 7 TC2 (telecommand 2)

Each line of a DISTRESS CALL / RELAY or ACK has:

- Line 1 Message number and Distress Call / ACK / Relay
- Line 2 MMSI number of ship in distress
- Line 3 UTC Time of position fix / Date when received
- Line 4 Position
- Line 5 Nature of Distress
- Line 6 ACK BY PHONE CHAN 2182 / Format By MMSI ID
- Line 7 Errors

Pressing the **SQL**
Print key will print the displayed message.

2:45	47° 47N 122° 19W
CH 451	
1=REVIEW	2=PROGRAM
3=DSC	4=NECODE
5=RELAY	6=ALL SHIP
7=PHONE	8=CLASS A

Primary DSC menu selections

2:45	47° 47N 122° 19W
CH 451	
1=ROUTINE LOG	
2=DISTRESS LOG	

Type of calls to review

#1 INDIVIDUAL from ABOVE H20 03:01 11/11/00 CHANNEL 451 NO-ERRS ACK COM-REQ: J3E VOICE TC2: NO-INFO UP=NXT DN=PRV DSC=CAL
--

Routine call message

#2 PH:14257712182 from MARINEOP 02:41 11/11/00 CHANNEL 405 NO-ERRS ACK COM-REQ: J3E VOIC TC2: NO-INFO UP=NXT DN=PRV DSC=CAL
--

Phone call message

#1 DISTRESS CALL from 987654321 NO-TIME 7/24/00 POS: NOT-GIVEN NATURE: NOT-GIVEN ACK-BY-PHONE: 2182.0 UP=NXT DN=PRV DSC=CAL

Distress call message review

DETAILS OF A “CLASS A” CALL

The DSC call formats described earlier in this manual are predefined message formats selected from all the possible formats defined by ITU 493. The predefined versions allow the operator to place calls quickly and efficiently without having to input several key presses for most routine calls.

Calls that contain more specific information, such as requiring a data response rather than voice communications, must access the CLASS A menu to create these types of messages. The following describes the structure or organization of CLASS A calls for the sections dealing with the individual format types.

To transmit a DSC call using the Class A format, press 8 ^T_U_V

2:45	47° 47N 122° 19W
CH 451	
1=REVIEW	2=PROGRAM
3=DSC	4=NECODE
5=RELAY	6=ALL SHIP
7=PHONE	8=CLASS A

Primary DSC menu selections

Most calls contain the following information:

Format Type, Priority Category, Telecommand1, Telecommand2

The CLASS A menu gives 6 DSC *format types* that may be used for calling.

DSTRESS, ALLSHIPS, INDIVIDL and **PHONE** have a predefined or simple version message format. **GEOAREA** and **GROUP** do not have predefined message formats.

2:45	47° 47N 122° 19W
CH 451	
1=DSTRESS	2=ALLSHIPS
3=GEOAREA	4=INDIVIDL
5=GROUP	6=PHONE

Format Types

Depending on which DSC format was selected, the operator may be prompted for additional information before the priority category prompt appears. The format type of Distress (not a priority category of distress) has a specific structure and will prompt for the nature of the distress rather than a priority category.

The **priority category** designates the importance of the selected message format.

Routine indicating a normal priority.

Ship Business relates to management of the ship.

Safety indicates important navigational or meteorological warning.

Urgency relates to safety of life or property.

Distress is grave and imminent danger to life and property with immediate assistance required.

2:45	47° 47N 122° 19W
CH 451	
1=ROUTINE	2=SHIP-BUS
3=SAFETY	4=URGENCY
5=DISTRESS	

Priority categories

Telecommand 1 (TC1) is defined as the form of communications the receiving station should use to respond with after receiving the call. The choices for TC1 or responses expected are:

J3E VOICE Voice communications using single side band.

H3E VOICE Voice communications using inserted carrier.

F1B FEC FSK digital communications using automatic reception of FEC telegraphy.

F1B ARQ FSK digital communications using automatic reception of ARQ telegraphy.

CANT DO Unable to Comply with request.

DATA FAX or MODEM data.

F1B TTY FSK digital communications using automatic reception of TTY telegraphy.

F1B TTYR FSK digital communications using automatic reception of TTY telegraphy - receive only.

CW TAPE CW communications using a taped message.

CW KEY CW communications.

FAX Facsimile.

NO INFO No additional information needed for response.

2:45	47° 47N 122° 19W
CH 451	
1=J3E VOICE	2=H3E
3=F1B FEC	4=F1B ARQ
5= CANT DO	6=DATA
7=F1BTTYR	UP=MORE

Method of communications for response (TC1)

2:45	47° 47N 122° 19W
CH 451	
1=F1B TTY	2=CW TAPE
3=CW KEY	4=FAX
5=NO INFO	UP=MORE

Method of communications for response (TC1)

Additional TC1 options for Distress priority categories and Individual, Group or Phone format types:

DSTACK All Ships format using Distress priority category to send a Distress Acknowledgment.

DST REL All Ships, Geoparea, Individl and Group format types using Distress priority category to send a Distress Relay.

POLLING Individual and Group format types to test if a station is present or able to receive.

POSITION Individual, Group and Phone format types to retrieve a stations position.

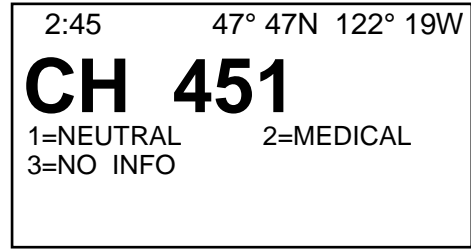
TEST Individual format using Safety priority category to test equipment and link.

END CALL Phone Call formats only.

Telecommand 2 (TC2) gives details to clarify the TC1 selection.

The available TC2 options in most cases are:

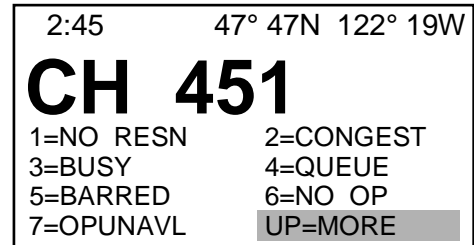
- NEUTRAL** A non warring vessel or neutral party.
- MEDICAL** A medical transport vessel.
- NO INFO** No additional information needed for response.



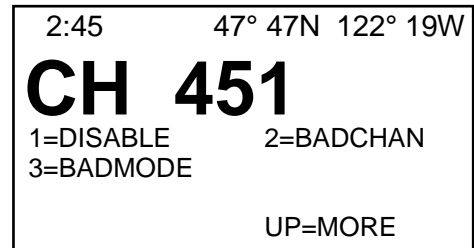
Details for communications response (TC2)

The **CANT DO** TC1 selection has 10 TC2 options to explain why the station is unable to comply with (can't do) a received DSC call.

- NO RESN** No reason given.
- CONGEST** The channel is congested.
- BUSY** Phone number is busy.
- QUEUE** Queue.
- BARRED** Restricted from use.
- NO OP** No operator present.
- OPUNAVL** Operator is unavailable.
- DISABLE** Equipment is disabled.
- BADCHAN** The requested channel is not valid or not available.
- BADMODE** The communications mode given is not valid or not available.



CANT DO Telecommand 2 options (TC2)



CANT DO Telecommand 2 options (TC2)

The *DATA* TC1 selection also has 10 TC2 options to specify the data protocol.

- FAX/DAT* Facsimile data.
- V.21* 300 bps duplex modem.
- V.22* 1200 bps duplex modem.
- V.22-bis* 2400 bps duplex modems.
- V.23* 600/1200 bps modems.
- V.26-bis* 2400/1200 bps modems.
- V.26-ter* 2400 bps duplex modems using echo cancellation.
- V.27-ter* 4800/2400 bps modems.
- V.32* Duplex modems up to 9600 bps.
- NO-INFO* No additional information.

```

2:45          47° 47N 122° 19W
CH 451
1=FAX/DAT    2=V.21
3=V.22       4=V.22BIS
5=V.23       6=V.26
7=V.26TER    UP=MORE
    
```

DATA Telecommand 2 options (TC2)

```

2:45          47° 47N 122° 19W
CH 451
1=V.27TER    2=V.32
3=NO INFO
                UP=MORE
    
```

DATA Telecommand 2 options (TC2)

After the TC2 option is selected, the operator is prompted to include the position with the call, switch to another working channel after the call is transmitted, or include no other information.

```

2:45          47° 47N 122° 19W
CH 451
1=NO OTHER INFO
2=INCLUDE POSITION
3=ALT CHN    4=ALT FRQ
SELECT 1-4
    
```

Final options before transmit

If an individual address has been specified, the operator must indicate if an **ACK** is required from the receiving station.

```

2:45          47° 47N 122° 19W
CH 451
1=REQUEST ACK
2=NO ACK NEEDED
3=SENT ACK
SELECT END 1-3 <1
    
```

Specify if ACK is needed for channel change

If Distress Acknowledgment or Distress Relay has been selected, you will be prompted to enter the DSC ID of the ship in distress as well as the position and nature of the distress.

DISTRESS CALL

CLASS A distress calls require the least amount of work to create. This reinforces the concept of keeping GMDSS distress alerting simple.

Press **DSC** **8** ^T_U_V **1** ^{SP} will display “PRESS DISTRESS 5 SECONDS TO CONFIRM”. Press and hold the DISTRESS key for 5 seconds.

Select the most suitable nature of the distress.

If the position data is not valid or is not available, the operator is prompted to input the position manually.

After the position has been entered, either automatically or manually, press **DSC** to transmit the call.

The radio will switch to 2187.5 kHz and transmit the call.

2:45 47° 47N 122° 19W

CH 451

1=REVIEW	2=PROGRAM
3=DSC	4=NECODE
5=RELAY	6=ALL SHIP
7=PHONE	8=CLASS A

Primary DSC menu selections

2:45 47° 47N 122° 19W

CH 451

1=DSTRESS	2=ALLSHIPS
3=GEOAREA	4=INDIVIDL
5=GROUP	6=PHONE

8=Class A call screen

2:45 47° 47N 122°

CH 451

1=NONE	2=FIRE
3=FLOOD	4=COLLIDE
5=GROUND	6=LISTING
7=SINKING	UP=MORE

Nature of Distress - screen one

2:45 47° 47N 122° 19W

CH 451

1=ADRIFT	2=ABANDON
3=PIRACY	4=MANOVER
5=EPIRB	UP=MORE

Nature of Distress - screen two

2:45 47° 47N 122° 19W

CH 451

PRESS DSC TO XMT

Transmitting the DSC call

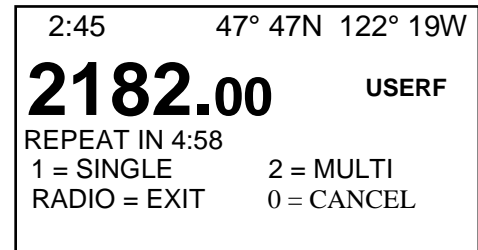
SENDING DSC MESSAGE

Transmit of DSC message

DISTRESS CALL (Cont.)

After first distress message is send on 2187.5 kHz, the radio display then say:

When “**1 = SINGLE**“ is selected, radio resends their DISTRESS call 5 times on the single 2187.5 kHz Primary DSC Distress frequency with about 35 seconds duration for each call and approximately 5 minutes interval between calls. This sequence will continue repeating until operator presses any of the other options in the WAITING FOR ACK screen. Pressing “**1 = SINGLE**” again restarts the sequence immediately.



AfterSent Distress Message

When “**2 = MULTI**“ is selected, DISTRESS call is sent on each DSC Distress frequency (2187.5 kHz, 4207.5 kHz, 6310.0 kHz, 8414.5 kHz, 12577.0 kHz, 16804.5 kHz) with a TX duration of about 10 seconds each and a pause between transmission just long enough to switch to the next DSC Distress frequency and approximately 5 minutes interval between calls. This sequence will continue repeating until operator presses any of the other options in the WAITING FOR ACK screen. Pressing “**2 = MULTI**” again restarts the sequence immediately.

When “**RADIO = EXIT**“ is selected, radio stops the entire DSC DISTRESS evolution, goes back to main radio screen.

When “**3 = CANCEL**“ is selected, radio sends “DSC DISTRESS CANCEL” and stops.

ALL SHIPS CALLS

Press **DSC** **8** **2** to select the All Ships format type.

The operator will be prompted to choose a priority category or level of importance for the call to be transmitted.

After selecting the priority category, select the form of communications the receiving station should use when responding to this call (TC1).

The secondary telecommand prompt (TC2) gives details to clarify the TC1 selection.

After the TC2 option is selected, the operator is prompted to include the position with the call, switch to another working channel after the call is transmitted, or include no other information.

Distress Acknowledgment or Distress Relay TC1 selections will prompt for the DSC ID of the ship in distress as well as position and nature of distress.

Transmit the call by pressing the **DSC** key.

2:45 47° 47N 122° 19W

CH 451

1=ROUTINE 2=SHIP-BUS
3=SAFETY 4=URGENCY
5=DISTRESS

All ships priority category

2:45 47° 47N 122° 19W

CH 451

1=J3E VOICE 2=H3E VOIC
3=F1B FEC 4=F1B ARQ
5=CANT DO 6=DATA
7=F1BTTYR **UP=MORE**

Method of communications for response (TC1)

2:45 47° 47N 122° 19W

CH 451

1=NEUTRAL 2=MEDICAL
3=NO INFO

Details for communications response (TC2)

2:45 47° 47N 122° 19W

CH 451

1=F1B TTY 2=MRSE TAP
3=MRSE KEY 4=FAX
5=NO INFO
UP=MORE

Method of communications for response (TC1)

2:45 47° 47N 122° 19W

CH 451

1=NO OTHER INFO
2=INCLUDE POSITION
3=ALT CHN 4=ALT FRQ
SELECT 1-4

Final options before transmit

2:45 47° 47N 122° 19W

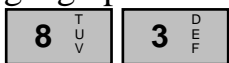
CH 451

PRESS DSC TO XMT

Transmitting the DSC call

GEOGRAPHICAL AREA CALLS

To send an All Ships call to a specific rectangular geographical area, select GEOAREA with **DSC**



Prompts will ask for the area's NW (top left) corner in Latitude and Longitude format.

Prompts will then ask for the size of the area in degrees. The lower right corner may be up to 99 degrees from the reference (top left) corner.

The operator will be prompted to choose a priority category or level of importance for the call to be transmitted.

After selecting the priority category, select the form of communications the receiving station should use when responding to this call (TC1).

The secondary telecommand prompt (TC2) gives details to clarify the TC1 selection.

After the TC2 option is selected, the operator is prompted to include the position with the call, switch to another working channel after the call is transmitted, or no other information.

2:45 47° 47N 122° 19W
CH 451
 SELECT QUADRANT OF AREA'S NW CORNER
 0=NE 1=NW
 2=SE 3=SW

Top left reference corner for Geoarea call

2:45 47° 47N 122° 19W
CH 451
 NW CORNER: 47°N 120 °W
 12° LAT BY ° LONG
 DELTA LNG (0-99°): **1**

Lower right corner for Geoarea call

2:45 47° 47N 122° 19W
CH 451
 1=ROUTINE 2=SHIP-BUS
 3=SAFETY 4=URGENCY
 5=DISTRESS

Priority categories

2:45 47° 47N 122° 19W
CH 451
 1=J3E VOICE 2=H3E VOIC
 3=F1B FEC 4=F1B ARQ
 5=CANT DO 6=DATA
 7=F1BTTYR UP=MORE

Method of communications for response (TC1)

2:45 47° 47N 122° 19W
CH 451
 1=NEUTRAL 2=MEDICAL
 3=NO INFO

Details for response (TC2)

2:45 47° 47N 122° 19W
CH 451
 1=NO OTHER INFO
 2=INCLUDE POSITION
 3=ALT CHN 4=ALT FRQ
 SELECT 1-4 <1

Final options before transmit

INDIVIDUAL / GROUP CALLS

To select an individual format type press **DSC** **8** **4** ^G_H_I.

To select a group format type press **DSC** **8** **5** ^J_K_L.

When calling an individual station or a group of stations, a prompt will appear showing the last station called and ask if the same ID is to be called.

If a different station is desired, press **2** ^A_B_C.

then use the **UP** and **DN** keys to select one of the seven screens of stored IDs. Select a station with a numeric key and **ENT**. You may also enter the number directly by pressing **0** ^O_Z 2182.

The operator will be prompted to choose a priority category or level of importance for the call to be transmitted.

After selecting the priority category, select the form of communications the receiving station should use when responding to this call (TC1).

The secondary telecommand prompt (TC2) gives details to clarify the TC1 selection.

After the TC2 option is selected, the operator is prompted to include the position with the call, switch to another working channel after the call is transmitted, or include no other information.

The operator must indicate if an ACK is required from the receiving station.

2:56 47° 47N 122° 19W
CH 451
 LAST STATION CALLED
 123456789
 CALL SAME STATION?
 1=YES 2=NO

Public coast station's MMSI
 1=ABOVE H2O
 2=BLACKDUCK
 3=BOBBINRND
 4=H2O TOYS
 5=MY DREAM
 6=INDPENDEN
 7=TEST STAT
 UP/DN, 1-7, 0=DIRECT

Select name assigned to MMSI numbers
 2:45 47° 47N 122° 19W
CH 451
 1=ROUTINE 2=SHIP-BUS
 3=SAFETY 4=URGENCY
 5=DISTRESS

Priority categories
 2:45 47° 47N 122° 19W
CH 451
 1=J3E VOICE 2=H3E VOIC
 3=F1B FEC 4=F1B ARQ
 5=CANT DO 6=DATA
 7=F1BTTYR UP=MORE

Method of communications for response (TC1)
 2:45 47° 47N 122° 19W
CH 451
 1=NEUTRAL 2=MEDICAL
 3=NO INFO

Details for response (TC2)
 2:45 47° 47N 122° 19W
CH 451
 1=NO OTHER INFO
 2=INCLUDE POSITION
 3=ALT CHN 4=ALT FRQ
 SELECT 1-4 <1

Final options before transmit

PHONE CALLS

To set up a telephone call through an appropriately equipped coast station press

DSC

8 ^T_U_V **4** ^G_H_I

It is strongly recommended that the predefined phone format described in “Placing A Telephone Call” be used unless special features are needed.

The last station called will be displayed and a prompt issued if the same station should be called.

If a different station is desired, press

2 ^A_B_C

then use the **UP** and **DN** keys to select one of the seven screens of

stored ID’s. Select a station with a numeric key and

ENT

You may also enter the number directly by pressing

0 ^Q_Z
2182

After selecting the station to be called, select the form of communications the receiving station should use when responding to this call (TC1).

The operator will be prompted to choose a priority category or level of importance for the call to be transmitted.

The secondary telecommand prompt (TC2) gives details to clarify the TC1 selection.

After the TC2 option is selected, the operator is prompted to select a phone number.

Finally, the operator is prompted to request an acknowledgment from or send an acknowledgment to the receiving station.

Pressing the **DSC** key will transmit the message to the coast station.

After DSC is transmitted, press

1 ^{SP}

to Accept or **2** ^A_B_C to Reject. **2** ^A_B_C will return you to main radio screen.

2:56 47° 47N
CH 451
LAST STATION CALLED
123456789
CALL SAME STATION?
1=YES 2=NO

Public coast station’s MMSI

2:45 47° 47N
CH
1=J3E 2=H3E
3=POSITON 4=CANT
6=DATA
7=FAX

Method of communications for

2:45 47° 47N
CH
2=MEDICAL
4=NO INFO

Details for response (TC2)

1=MAIN OFF
2=HOME
3=LBOWROOM
4=ENG REPAR
5=FLFC, RFRP
6=SEA
7=
UP/DN, 1-7, 0=DIRECT

Phone number identities

2:45 47° 47N
CH 451
1=REQUEST ACK
2=NO ACK NEEDED
3=SENT ACK
SELECT END 1-3 <1

Specify if ACK is needed for channel

2:45 47° 47N
CH 451
PRESS DSC TO XMT

Transmitting the DSC call

2:45 47° 47N
4205.00
INCOMING PHONE CALL
PRESS 1 TO ACCEPT
PRESS 2 REJECT

After the DSC call

SEA 245 VOICE FREQUENCY LISTING

VOICE CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
201	2003.0	2003.0	Ship-to-Ship, Great Lakes
202	2450.0	2003.0	KMI Point Reyes, CA
203	2006.0	2006.0	Alaska
205	2446.0	2009.0	WLO, Mobile, AL
206	2506.0	2009.0	WAH, St. Thomas
208	2030.0	2030.0	Virgin Islands, Intership
209	2490.0	2031.5	WOM, Ft. Lauderdale, FL
211	2054.0	2054.0	British Columbia WX
212	2065.0	2065.0	Ship-to-Ship
213	2079.0	2079.0	Ship-to-Ship
214	2082.5	2082.5	Ship-to-Ship Only
215	2086.0	2086.0	Ship-to-Ship, Miss. River Limited Coast
216	2585.0	2086.0	KRV, Pence Playa, WAH, St. Thomas, VI
217	2093.0	2093.0	Ship-to-Ship Only Commercial Fish
218	2096.5	2096.5	Ship-to-Ship, Ship to Limited Coast Station
219	2115.0	2115.0	Alaska
220	2118.0	2118.0	Alaska
221	2514.0	2118.0	WOM, Ft. Lauderdale, FL WLC, Rogers City, MI
223	2309.0	2131.0	WOU-23, Kodiak, AK
224	2312.0	2134.0	WGG-53, Cold Bay, AK
225	2530.0	2134.0	KBP, Kahuka, HI, KOP, Galveston
226	2134.0	2134.0	Eastern Canada Intership
227	2538.0	2142.0	KCC, Corpus Christi, TX
228	2142.0	2142.0	CA Intership
229	2146.0	2146.0	
230	2550.0	2158.0	PJC, Curacao
231	2550.0	2166.0	VRT, Bermuda
232	2558.0	2186.0	WOO, Manahawkin, NJ
233	2582.0	2166.0	8PO, Barbados, C6XZ, Marsh Harbor
234	2558.0	2198.0	VPN-2, Nassau Weather
236	2203.0	2203.0	Ship-to-Ship, Gulf of Mexico

FREQUENCY LISTINGS

VOICE CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
238	2582.0	2206.0	WBL, Buffalo, NY VCS, Halifax, Canada
239	2397.0	2237.0	WDV-26, Cordova WGG-56, Ketchikan, AK
240	2400.0	2240.0	WGG-58, Juneau, AK WGG-55, Nome, AK
241	2735.0	2290.0	9YL, North Post, Trinidad
242	2450.0	2366.0	
245	2566.0	2390.0	WOM, Ft Lauderdale, FL
246	2400.0	2400.0	
247	2442.0	2406.0	WOM, Ft Lauderdale, FL
248	2506.0	2406.0	KMI, Point Reyes, CA
249	2419.0	2419.0	Alaska
250	2422.0	2422.0	Alaska
251	2427.0	2427.0	Alaska
252	2572.0	2430.0	WLO, Mobile, AL
254	2430.0	2430.0	Alaska
255	2447.0	2447.0	Alaska
256	2450.0	2450.0	Alaska
257	2506.0	2458.0	KGN, Delcambre, LA
258	2479.0	2479.0	Alaska
259	2482.0	2482.0	Alaska
261	2506.0	2506.0	Alaska
262	2509.0	2509.0	Alaska
263	2512.0	2512.0	FFP, Ft. DeFrance, Windward Is.
264	2545.0	2545.0	
265	2527.0	2527.0	Alaska
266	2535.0	2535.0	
267	2538.0	2538.0	Alaska
268	2563.0	2583.0	Alaska
269	2566.0	2566.0	Alaska
270	2582.0	2582.0	Alaska
271	2590.0	2590.0	Alaska
273	2616.0	2616.0	Alaska
275	2638.0	2638.0	Ship-to-Ship
276	2640.0	2640.0	
277	2670.0	2870.0	USCG Working
278	2704.0	2704.0	Ocean Racing
279	2735.0	2735.0	9YL, North Post, Trinidad

FREQUENCY LISTINGS

VOICE CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
280	2738.0	2738.0	Ship-to-Ship Except Great Lakes and Gulf
281	2782.0	2782.0	Ship-to-Ship River WFN, Jeffersonville, IN WGK, St. Louis, MO WJG, Memphis, TN
282	2830.0	2830.0	Ship-to-Ship, Gulf Only
283	2237.0	2237.0	
284	2530.0	2815.0	
285	2040.0	2040.0	
286	2318.0	2318.0	
287	2366.0	2366.0	
288	2469.0	2708.0	
289	2060.0	2798.0	
290	2458.0	2340.0	
291	2085.0	2045.0	NORWEGIAN
292	2048.0	2048.0	NORWEGIAN
293	2051.0	2051.0	NORWEGIAN
294	2057.0	2057.0	NORWEGIAN
302	3198.0	3198.0	Alaska Point-to-Point
303	3201.0	3201.0	Alaska Point-to-Point
304	3258.0	3258.0	Alaska
305	3261.0	3261.0	Alaska
306	3449.0	3449.0	Alaska Aero
401	4357.0	4065.0	KMI, Point Reyes, CA WAH, St. Thomas, VI
402	4360.0	4068.0	
403	4363.0	4071.0	WOM, Ft. Lauderdale, FL
404	4366.0	4074.0	KGN, Delcambre, LA
405	4369.0	4077.0	WLO, Mobile, AL WLC, Roger City, MI
406	4372.0	4080.0	
407	4375.0	4083.0	
408	4378.0	4086.0	
409	4381.0	4089.0	
410	4384.0	4092.0	WOO, Manahawkin, NJ
411	4387.0	4095.0	WOO, Manahawkin, NJ
412	4390.0	4098.0	WOM, Ft. Lauderdale, FL

FREQUENCY LISTINGS

VOICE CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
413	4393.0	4101.0	
414	4396.0	4104.0	WLO, Mobile, AL
415	4399.0	4107.0	
416	4402.0	4110.0	KMI, Point Reyes, CA
417	4405.0	4113.0	WOO, Manahawkin, NJ KMI, Point Reyes, CA WOM, Ft. Lauderdale, FL
418	4408.0	4116.0	
419	4411.0	4119.0	WLO, Mobile, AL
420	4414.0	4122.0	
421	4417.0	4125.0	
422	4420.0	4128.0	WOO, Manahawkin, NJ
423	4423.0	4131.0	WOM, Ft. Lauderdale, FL
424	4426.0	4134.0	NMG, New Orleans, LA NMN, Portsmouth, VA, WX
425	4429.0	4137.0	
426	4432.0	4140.0	
427	4435.0	4143.0	
428	4351.0	4060.0	WLO, Mobile, AL
450	4125.0	4125.0	DISTRESS
451	4146.0	4146.0	4A LTD Coast/Intership
452	4149.0	4149.0	4B LTD Coast/Intership
453	4417.0	4417.0	4C LTD Coast/Intership
454	4366.0	4366.0	Alaska
455	4369.0	4369.0	Alaska
456	4396.0	4396.0	Alaska
457	4402.0	4402.0	Alaska
458	4420.0	4420.0	Alaska
459	4423.0	4423.0	Alaska
460	4065.0	4065.0	Mississippi River
461	4089.0	4089.0	Mississippi River
462	4116.0	4116.0	Mississippi River
463	4408.0	4408.0	Mississippi River
501	5164.5	5164.5	Alaska Public Fixed
502	5167.5	5167.5	Alaska Emergency/Calling
503	5680.0	5680.0	Aero Search/Rescue
504	5472.0	5472.0	Aero Search/Rescue
505	5490.0	5490.0	Aero

FREQUENCY LISTINGS

VOICE CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
601	6501.0	6200.0	NMN, Portsmouth, VA NMG, New Orleans, LA MNA, Miami, FL
602	6504.0	6203.0	
603	6507.0	6206.0	
604	6510.0	6209.0	
605	6513.0	6212.0	
606	6516.0	6215.0	
607	6519.0	6218.0	WLO, Mobile, AL
608	6522.0	6221.0	
650	6215.0	6215.0	DISTRESS
651	6224.0	6224.0	6A LTD Coast/Intership
652	6227.0	6227.0	6B LTD Coast/Intership
653	6230.0	6230.0	6C LTD Coast/Intership
654	6516.0	6616.0	6D LTD Coast DAYTIME ONLY
655	6209.0	6209.0	Mississippi River
656	6212.0	6212.0	Mississippi River
657	6510.0	6510.0	Mississippi River
658	6513.0	6513.0	Mississippi River
801	8719.0	8195.0	
802	8722.0	8198.0	WOM, Ft. Lauderdale, FL
803	8725.0	8201.0	
804	8728.0	8204.0	KMI, Point Reyes, CA
805	8731.0	8207.0	WOM, Ft. Lauderdale, FL
806	8734.0	8210.0	
807	8737.0	8213.0	
808	8740.0	8216.0	WOO, Manahawkin, NJ
809	8743.0	8219.0	KMI, Point Reyes, CA
810	8746.0	8222.0	WOM, Ft. Lauderdale, FL
811	8749.0	8225.0	WOO, Manahawkin, NJ
812	8752.0	8228.0	
813	8755.0	8231.0	
814	8758.0	8234.0	WOM, Ft. Lauderdale, FL
815	8761.0	8237.0	WOO, Manahawkin, NJ
816	8764.0	8240.0	
817	8767.0	8243.0	
818	8770.0	8246.0	
819	8773.0	8249.0	

FREQUENCY LISTINGS

VOICE CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
820	8776.0	8252.0	
821	8779.0	8255.0	
822	8782.0	8258.0	KMI, Point Reyes, CA
823	8785.0	8261.0	
824	8788.0	8264.0	WLO, Mobile, AL
825	8791.0	8267.0	WOM, Ft. Lauderdale, FL
826	8794.0	8270.0	WOO, Manahawkin, NJ WLC, Rogers City, MI
827	8797.0	8273.0	
828	8800.0	8276.0	
829	8803.0	8279.0	
830	8806.0	8282.0	WLO, Mobile, AL
831	8809.0	8285.0	WOM, Ft. Lauderdale, FL
832	8812.0	8288.0	
833	8291.0	8291.0	
836	8713.0	8113.0	WLO, Mobile, AL
837	8716.0	8128.0	KGN, Delcambre, LA
850	8291.0	8291.0	DISTRESS
851	8294.0	8294.0	8A LTD Coast/Intership
852	8297.0	8297.0	8B LTD Coast/Intership
853	8201.0	8201.0	WFN, Jeffersonville, Mississippi. River
854	8213.0	8213.0	WGK, St. Louis, Miss. River
855	8725.0	8725.0	Mississippi River
1209	13101.0	12254.0	WOM, Ft. Lauderdale, FL
1210	13104.0	12257.0	WOO, Manahawkin, NJ
1211	13107.0	12260.0	WOO, Manahawkin, NJ
1212	13110.0	12263.0	WLO, Mobile, AL
1213	13113.0	12266.0	
1214	13116.0	12269.0	USCG, Miami/Portsmouth
1215	13119.0	12272.0	WOM, Ft. Lauderdale, FL
1216	13122.0	12275.0	
1217	13125.0	12278.0	
1218	13128.0	12281.0	
1219	13131.0	12284.0	
1220	13134.0	12287.0	
1221	13137.0	12290.0	
1222	13140.0	12293.0	
1223	13143.0	12296.0	WOM, Ft. Lauderdale, FL

FREQUENCY LISTINGS

VOICE CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
1224	13146.0	12299.0	
1225	13149.0	12302.0	
1226	13152.0	12305.0	
1227	13155.0	12308.0	
1228	13158.0	12311.0	WOO, Manahawkin, NJ
1229	13161.0	12314.0	KMI, Point Reyes, CA
1230	13164.0	12317.0	WOM, Ft. Lauderdale, FL
1231	13167.0	12320.0	
1232	13170.0	12323.0	
1233	13173.0	12326.0	WLO, Mobile, AL
1234	13176.0	12329.0	
1235	13179.0	12332.0	WLO, Mobile, AL
1236	13182.0	12335.0	
1234	13176.0	12329.0	
1235	13179.0	12332.0	WLO, Mobile, AL
1250	12290.0	12290.0	DISTRESS
1251	12353.0	12353.0	12A LTD Coast/Intership
1252	12356.0	12356.0	12B LTD Coast/Intership
1253	12359.0	12359.0	12C LTD Coast/Intership
1254	12362.0	12362.0	PUB. COAST & Miss. River
1255	12365.0	12365.0	PUB. COAST & Miss. River
1601	17242.0	16360.0	WOM, Ft. Lauderdale, FL
1602	17245.0	16363.0	KMI, Point Reyes, CA
1603	17248.0	16366.0	KMI, Point Reyes, CA
1604	17251.0	16369.0	
1605	17254.0	16372.0	WOO, Manahawkin, NJ
1606	17257.0	16375.0	
1607	17260.0	16378.0	
1608	17263.0	16381.0	
1609	17266.0	16384.0	WOM, Ft. Lauderdale, FL
1610	17269.0	16387.0	WOM, Ft. Lauderdale, FL
1611	17272.0	16390.0	WOM, Ft. Lauderdale, FL
1612	17275.0	16393.0	
1613	17278.0	16396.0	
1614	17281.0	16399.0	
1615	17284.0	16402.0	
1616	17287.0	16405.0	WOM, Ft. Lauderdale, FL
1617	17290.0	16408.0	
1618	17293.0	16411.0	

FREQUENCY LISTINGS

VOICE CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
1619	17296.0	16414.0	
1620	17299.0	16417.0	WOO, Manahawkin, NJ
1621	17302.0	16420.0	
1622	17305.0	16423.0	
1623	17308.0	16426.0	
1624	17311.0	16429.0	KMI, Point Reyes, CA
1625	17314.0	16432.0	USCG, Miami, Portsmouth
1634	17341.0	16459.0	
1635	17344.0	16462.0	
1636	17347.0	16465.0	
1637	17350.0	16468.0	
1638	17353.0	16471.0	
1639	17356.0	16474.0	
1640	17359.0	16477.0	
1641	17362.0	16480.0	WLO, Mobile, AL
1642	17365.0	16483.0	
1643	17368.0	16486.0	WLO, Mobile, AL
1644	17371.0	16489.0	
1645	17374.0	16492.0	KGN, Delcambre, LA
1646	17377.0	16495.0	
1647	17380.0	16498.0	WLO, Mobile, AL
1648	17383.0	16501.0	
1649	17386.0	16504.0	
1650	16420.0	16420.0	DISTRESS
1651	16528.0	16528.0	16A LTD Coast/Intership
1652	16531.0	16531.0	16B LTD Coast/Intership
1653	16534.0	16534.0	16C LTD Coast/Intership
1654	16537.0	16537.0	
1655	16540.0	16540.0	
1656	16543.0	16543.0	PUB. COAST & Miss. River
1657	16546.0	16546.0	PUB. COAST & Miss. River
1801	19755.0	18780.0	
1802	19758.0	18783.0	
1803	19761.0	18786.0	
1804	19764.0	18789.0	
1805	19767.0	18792.0	
1806	19770.0	18795.0	
1807	19773.0	18798.0	WLO, Mobile, AL
1808	19776.0	18801.0	

FREQUENCY LISTINGS

VOICE CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
1809	19779.0	18804.0	
1810	19782.0	18807.0	
1811	19785.0	18810.0	
1812	19788.0	18813.0	
1813	19791.0	18816.0	
1814	19794.0	18819.0	
1815	19797.0	18822.0	
1851	18840.0	18840.0	18A LTD Coast/Intership
1852	18843.0	18843.0	18B LTD Coast/Intership
1853	18825.0	18825.0	
1854	18828.0	18828.0	
1855	18831.0	18831.0	
1856	18834.0	18834.0	
1857	18837.0	18837.0	
2201	22896.0	22000.0	WOO, Manahawkin, NJ
2202	22699.0	22003.0	
2203	22702.0	22006.0	
2204	22705.0	22009.0	
2205	22708.0	22012.0	WOO, Manahawkin, NJ
2206	22711.0	22015.0	
2207	22714.0	22018.0	
2208	22717.0	22021.0	
2209	22720.0	22024.0	
2210	22723.0	22027.0	WOO, Manahawkin, NJ
2211	22726.0	22030.0	
2212	22729.0	22033.0	
2213	22732.0	22036.0	
2214	22735.0	22039.0	KMI, Point Reyes, CA
2215	22738.0	22042.0	WOM, Ft. Lauderdale, FL
2216	22741.0	22045.0	WOM, Ft. Lauderdale, FL
2217	22744.0	22048.0	
2218	22747.0	22051.0	
2219	22750.0	22054.0	
2220	22753.0	22057.0	
2221	22756.0	22060.0	
2222	22759.0	22063.0	WOM, Ft. Lauderdale, FL
2223	22762.0	22066.0	KMI, Point Reyes, CA
2224	22765.0	22069.0	

FREQUENCY LISTINGS

VOICE CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
2225	22768.0	22072.0	
2226	22771.0	22075.0	
2227	22774.0	22078.0	
2228	22777.0	22081.0	KMI, Point Reyes, CA
2229	22780.0	22084.0	
2230	22783.0	22087.0	
2231	22786.0	22090.0	
2232	22789.0	22093.0	
2233	22792.0	22096.0	
2234	22795.0	22099.0	
2235	22798.0	22102.0	
2236	22801.0	22105.0	KMI, Point Reyes, CA WOO, Manahawkin, NJ
2237	22804.0	22108.0	WLO, Mobile, AL
2238	22807.0	22111.0	
2239	22810.0	22114.0	
2240	22813.0	22117.0	
2241	22816.0	22120.0	
2242	22819.0	22123.0	WLO, Mobile, AL
2243	22822.0	22126.0	
2244	22825.0	22129.0	
2245	22828.0	22132.0	
2246	22831.0	22135.0	WLO, Mobile, AL
2247	22834.0	22138.0	
2248	22837.0	22141.0	
2249	22840.0	22144.0	
2250	22843.0	22147.0	
2254	22168.0	22168.0	22D LTD Coast/Intership
2255	22171.0	22171.0	22E LTD Coast/Intership
2256	22174.0	22174.0	Public Coast
2257	22177.0	22177.0	Public Coast
2501	26145.0	25070.0	
2502	26148.0	25073.0	
2503	26151.0	25076.0	WLO, Mobile, AL
2504	26154.0	25079.0	
2505	26157.0	25082.0	
2506	26160.0	25085.0	
2507	26163.0	25088.0	

FREQUENCY LISTINGS

VOICE CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
2508	26166.0	25091.0	
2509	26169.0	25094.0	
2510	26172.0	25097.0	
2551	25115.0	25115.0	25A LTD Coast/Intership
2552	25118.0	25118.0	25B LTD Coast/Intership
2553	25100.0	25100.0	
2554	25103.0	25103.0	
2555	25106.0	25106.0	
2556	25109.0	25109.0	
2557	25112.0	25112.0	

DSC EMERGENCY CALLING FREQUENCIES

VOICE CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
	2174.5	2174.5	DSC EMER CALLING
	2187.5	2187.5	DSC EMER CALLING
	4207.5	4207.5	DSC EMER CALLING
	6312.0	6312.0	DSC EMER CALLING
	8414.5	8414.5	DSC EMER CALLING
	12577.0	12577.0	DSC EMER CALLING
	16804.5	16804.5	DSC EMER CALLING

SEA 245 TELEX FREQUENCY LISTING

TELEX CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
401	4210.5	4172.5	WNU
402	4211.0	4173.0	ZLA
403	4211.5	4173.5	KFS
404	4212.0	4174.0	

FREQUENCY LISTINGS

TELEX CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
405	4212.5	4174.5	WLO
406	4213.0	4175.0	WLO, VIP
407	4213.5	4175.5	KBS
408	4214.0	4176.0	KLB, WPD
409	4214.5	4176.6	KLC
410	4215.0	4177.0	WLO
411	4177.5	4177.5	NBDP EMER CALLING
412	4215.5	4178.0	KBS
413	4216.0	4178.5	KPH
414	4216.5	4179.0	WCC
415	4217.0	4179.5	WLO
416	4217.5	4180.0	VCT
417	4218.0	4180.5	WLO
418	4218.5	4181.0	
419	4219.0	4181.5	
471	4202.5	4202.5	
472	4203.0	4203.0	
473	4203.5	4203.5	
474	4204.0	4204.0	
475	4204.5	4204.5	
476	4205.0	4205.0	
477	4205.5	4205.5	
478	4206.0	4206.0	
479	4206.5	4206.5	
480	4207.0	4207.0	
601	6314.5	6263.0	KFS
602	6315.0	6263.5	WNU
603	6315.5	6264.0	KFS
604	6316.0	6264.5	
605	6316.5	6265.0	
606	6317.0	6265.5	WLO
607	6317.5	6266.0	
608	6318.0	6266.5	KLB
609	6318.5	6267.0	KLC
610	6319.0	6267.5	WLO
611	6268.0	6268.0	NBDP EMER CALLING
612	6319.5	6268.5	
613	6320.0	6269.0	KPH

FREQUENCY LISTINGS

TELEX CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
614	6320.5	6269.5	
615	6521.0	6270.0	WLO
616	6321.5	6270.5	
617	6322.0	6271.0	KLC
618	6322.5	6271.5	
619	6323.0	6272.0	WLO
620	6323.5	6272.5	
621	6324.0	6273.0	WCC
622	6324.5	6273.6	KPH, KLC
623	6325.0	6274.0	
624	6325.5	6274.5	
625	6326.0	6275.0	
626	6326.5	6275.5	
627	6327.0	6281.0	
628	6327.5	6281.5	
629	6328.0	6282.0	
630	6328.5	6282.5	
631	6329.0	6283.0	
632	6329.5	6283.5	
633	6330.0	6284.0	
634	6330.5	6284.5	
671	6300.5	6300.5	
672	6301.0	6301.0	
673	6301.5	6301.5	
674	6302.0	6302.0	
675	6302.5	6302.5	
676	6303.0	6303.0	
677	6303.5	6303.5	
678	6304.0	6304.0	
679	6304.5	6304.5	
680	6305.0	6305.0	
681	6305.5	6305.5	
682	6306.0	6306.0	
683	6306.5	6306.5	
684	6307.0	6307.0	
685	6307.5	6307.5	
686	6308.0	6308.0	
687	6308.5	6308.5	
688	6309.0	6309.0	

FREQUENCY LISTINGS

TELEX CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
689	6309.5	6309.5	
690	6310.0	6310.0	
691	6310.5	6310.5	
692	6311.0	6311.0	
693	6311.5	6311.5	
801	8376.5	8376.5	NBDP EMER CALLING
802	8417.0	8377.0	WNU
803	8417.5	8377.5	KFS
804	8418.0	8378.0	
805	8418.5	8378.5	WLO
806	8419.0	8379.0	WLO
807	8419.5	8379.5	
808	8420.0	8380.0	
809	8420.5	8380.5	KLC
810	8421.0	8381.0	WLO
811	8421.5	8381.5	WLO
812	8422.0	8382.0	
813	8422.5	8382.5	KPH
814	8423.0	8383.0	
815	8423.5	8383.5	WLO
816	8424.0	8384.0	WCC
817	8424.5	8384.5	KLC
818	8425.0	8385.0	KLB
819	8425.5	8385.5	
820	8426.0	8386.0	
821	8426.5	8386.5	WCC
822	8427.0	8387.0	KLC
823	8427.5	8387.5	
824	8428.0	8388.0	
825	8428.5	8388.5	
826	8429.0	8389.0	WLO
827	8429.5	8389.5	
828	8430.0	8390.0	
829	8430.5	8390.5	
830	8431.0	8391.0	
831	8431.5	8391.5	
832	8432.0	8392.0	
833	8432.5	8392.5	
834	8433.0	8393.0	

FREQUENCY LISTINGS

TELEX CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
835	8433.5	8393.5	
836	8434.0	8394.0	
837	8434.5	8394.5	
838	8435.0	8395.0	
839	8435.5	8395.5	
840	8436.0	8396.0	
871	8396.5	8396.5	
872	8397.0	8397.0	
873	8397.5	8397.5	
874	8398.0	8398.0	
875	8398.5	8398.5	
876	8399.0	8399.0	
877	8399.5	8399.5	
878	8400.0	8400.0	
879	8400.5	8400.5	
880	8401.0	8401.0	
881	8401.5	8401.5	
882	8402.0	8402.0	
883	8402.5	8402.5	
884	8403.0	8403.0	
885	8403.5	8403.5	
886	8404.0	8404.0	
887	8404.5	8404.5	
888	8405.0	8405.0	
889	8405.5	8405.5	
890	8406.0	8406.0	
891	8406.5	8406.5	
892	8407.0	8407.0	
893	8407.5	8407.5	
894	8408.0	8408.0	
895	8408.5	8408.5	
896	8409.0	8409.0	
897	8409.5	8409.5	
898	8410.0	8410.0	
899	8410.5	8410.5	
900	8411.0	8411.0	
901	8411.5	8411.5	
902	8412.0	8412.0	
903	8412.5	8412.5	

FREQUENCY LISTINGS

TELEX CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
904	8413.0	8413.0	
905	8413.5	8413.5	
906	8414.0	8414.0	
1201	12579.5	12477.0	
1202	12580.0	12477.5	ZLA
1203	12580.5	12478.0	KFS
1204	12581.0	12478.5	
1205	12581.5	12479.0	WLO
1206	12582.0	12479.5	VIP
1207	12582.5	12480.0	
1208	12583.0	12480.5	
1209	12583.5	12481.0	KLC
1210	12584.0	12481.5	VIP
1211	12584.5	12482.0	WLO
1212	12585.0	12482.5	
1213	12585.5	12483.0	KPH
1214	12586.0	12483.5	
1215	12586.5	12484.0	WLO
1216	12587.0	12484.5	
1217	12587.5	12485.0	KLC
1218	12588.0	12485.5	
1219	12588.5	12486.0	WNU
1220	12589.0	12486.5	
1221	12589.5	12487.0	WCC
1222	12590.0	12487.5	KLC
1223	12590.5	12488.0	KLB
1224	12591.0	12488.5	
1225	12591.5	12489.0	WLO
1226	12592.0	12489.5	
1227	12592.5	12490.0	
1228	12593.0	12490.5	
1229	12593.5	12491.0	WLO
1230	12594.0	12491.5	
1231	12594.5	12492.0	
1232	12595.0	12492.5	
1233	12595.5	12493.0	
1234	12596.0	12493.5	WLO
1235	12596.5	12494.0	
1236	12597.0	12494.5	

FREQUENCY LISTINGS

TELEX CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
1237	12597.5	12495.0	
1238	12598.0	12495.5	WCC
1239	12598.5	12496.0	
1240	12599.0	12496.5	WLO
1241	12599.5	12497.0	
1242	12600.0	12497.5	KPH
1243	12600.5	12498.0	
1244	12601.0	12498.5	
1245	12601.5	12499.0	
1246	12602.0	12499.5	
1247	12602.5	12500.0	
1248	12603.0	12500.5	KLC
1249	12603.5	12501.0	
1250	12604.0	12501.5	WLO
1251	12604.5	12502.0	WLO
1252	12605.0	12502.5	
1253	12605.5	12503.0	
1254	12606.0	12503.5	WLO
1255	12606.5	12504.0	
1256	12807.0	12504.5	
1257	12607.5	12505.0	WNU
1258	12608.0	12505.5	
1259	12608.5	12506.0	
1260	12609.0	12506.5	
1261	12609.5	12507.0	
1262	12610.0	12507.5	
1263	12610.5	12508.0	VCT
1264	12611.0	12508.5	
1265	12611.5	12509.0	KEJ
1266	12612.0	12509.5	
1267	12612.5	12510.0	
1268	12613.0	12510.5	
1269	12613.5	12511.0	
1270	12614.0	12511.5	
1271	12614.5	12512.0	
1272	12615.0	12512.5	
1273	12615.5	12513.0	
1274	12616.0	12513.5	
1275	12616.5	12514.0	
1276	12617.0	12514.5	

FREQUENCY LISTINGS

TELEX CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
1277	12617.5	12515.0	
1278	12618.0	12515.5	
1279	12618.5	12516.0	
1280	12619.0	12516.5	
1281	12619.5	12517.0	
1282	12620.0	12517.5	
1283	12620.5	12518.0	
1284	12621.0	12518.5	
1285	12621.5	12519.0	
1286	12622.0	12519.5	
1287	12520.0	12520.0	NBDP EMER CALLING
1288	12622.5	12520.5	
1289	12623.0	12521.0	
1290	12623.5	12521.5	
1291	12624.0	12522.0	SAB
1292	12624.5	12522.5	
1293	12625.0	12523.0	
1294	12625.5	12523.5	
1295	12626.0	12524.0	
1296	12626.5	12524.5	
1297	12627.0	12525.0	
1298	12627.5	12525.5	
1299	12628.0	12526.0	
1300	12628.5	12526.5	
1301	12629.0	12527.0	
1302	12629.5	12527.5	
1303	12630.0	12528.0	
1304	12630.5	12528.5	
1305	12631.0	12529.0	
1306	12631.5	12529.5	
1307	12632.0	12530.0	
1308	12632.5	12530.5	
1309	12633.0	12531.0	
1310	12633.5	12531.5	
1311	12634.0	12532.0	
1312	12634.5	12532.5	
1313	12635.0	12533.0	
1314	12635.5	12533.5	
1315	12636.0	12534.0	
1316	12636.5	12534.5	

FREQUENCY LISTINGS

TELEX CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
1317	12637.0	12535.0	
1318	12637.5	12535.5	
1319	12638.0	12536.0	
1320	12638.5	12536.5	
1321	12639.0	12537.0	
1322	12639.5	12537.5	
1323	12640.0	12538.0	
1324	12640.5	12538.5	
1325	12641.0	12539.0	
1326	12641.5	12539.5	
1327	12642.0	12540.0	
1328	12642.5	12540.5	
1329	12643.0	12541.0	
1330	12643.5	12541.5	
1331	12644.0	12542.0	
1332	12644.5	12542.5	
1333	12645.0	12543.0	
1334	12645.5	12543.5	
1335	12646.0	12544.0	
1336	12646.5	12544.5	
1337	12647.0	12545.0	
1338	12647.5	12545.5	
1339	12648.0	12546.0	
1340	12648.5	12546.5	
1341	12649.0	12547.0	
1342	12649.5	12547.5	
1343	12650.0	12548.0	
1344	12650.5	12548.5	
1345	12651.0	12549.0	
1346	12651.5	12549.5	
1347	12652.0	12555.0	
1348	12652.5	12555.5	
1349	12653.0	12556.0	
1350	12653.5	12556.5	
1351	12654.0	12557.0	
1352	12654.5	12557.5	
1353	12655.0	12558.0	
1354	12655.5	12558.5	
1355	12656.0	12559.0	
1356	12656.5	12559.5	

FREQUENCY LISTINGS

TELEX CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
1371	12560.0	12560.0	
1372	12560.5	12560.5	
1373	12561.0	12561.0	
1374	12561.5	12561.5	
1375	12562.0	12562.0	
1376	12562.5	12562.5	
1377	12563.0	12563.0	
1378	12563.5	12563.5	
1379	12564.0	12564.0	
1380	12564.5	12564.5	
1381	12565.0	12565.0	
1382	12565.5	12565.5	
1383	12566.0	12566.0	
1384	12566.5	12566.5	
1385	12567.0	12567.0	
1386	12567.5	12567.5	
1387	12568.0	12568.0	
1388	12568.5	12568.5	
1389	12569.0	12569.0	
1390	12569.5	12569.5	
1391	12570.0	12570.0	
1392	12570.5	12570.5	
1393	12571.0	12571.0	
1394	12571.5	12571.5	
1395	12572.0	12572.0	
1396	12572.5	12572.5	
1397	12573.0	12573.0	
1398	12573.5	12573.5	
1399	12574.0	12574.0	
1400	12574.5	12574.5	
1401	12575.0	12575.0	
1402	12575.5	12575.5	
1403	12576.0	12576.0	
1404	12576.5	12576.5	
1601	16807.0	16683.5	
1602	16807.5	16684.0	ZLA
1603	16808.0	16684.5	KFS
1604	16808.5	16685.0	KLB

FREQUENCY LISTINGS

TELEX CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
1605	16809.0	16685.5	WLO
1606	16809.5	16686.0	VIP
1607	16810.0	16686.5	
1608	16810.5	16687.0	
1609	16811.0	16687.5	KLC
1610	16811.5	16688.0	VIP
1611	16812.0	16688.5	WLO
1612	16812.5	16689.0	
1613	16813.0	16689.5	KPH
1614	16813.5	16690.0	
1615	18814.0	16690.5	WLO
1616	16814.5	16691.0	
1617	16815.0	16691.5	KLC
1618	16815.5	16692.0	
1619	16816.0	16692.5	WNU
1620	16816.5	16693.0	
1621	16817.0	16693.5	
1622	16817.5	16694.0	KPH, KLC
1623	16818.0	16694.5	
1624	16695.0	16695.0	NBDP EMER CALLING
1625	16818.5	16695.5	WLO
1626	16819.0	16696.0	
1627	16819.5	16696.5	
1628	16820.0	16697.0	
1629	16820.5	16697.5	WLO
1630	16821.0	16698.0	
1631	16821.5	16698.5	
1632	16822.0	16699.0	
1633	16822.5	16699.5	
1634	16823.0	16700.0	
1635	16823.5	16700.5	
1636	16824.0	16701.0	
1637	16824.5	16701.5	
1638	16825.0	16702.0	WCC
1639	16825.5	16702.5	
1640	16826.0	16703.0	WLO
1641	16826.5	16703.5	
1642	16827.0	16704.0	
1643	16827.5	16704.5	
1644	16828.0	16705.0	WLO

FREQUENCY LISTINGS

TELEX CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
1645	16828.5	16705.5	
1646	16829.0	16706.0	
1647	16829.5	16706.5	KFS
1648	16830.0	16707.0	KLC
1649	16830.5	16707.5	
1650	16831.0	16708.0	WLO
1651	16831.5	16708.5	
1652	16832.0	16709.0	WNU
1653	16832.5	16709.5	
1654	16833.0	16710.0	WLO
1655	16833.5	16710.5	
1656	16834.0	16711.0	
1657	16834.5	16711.5	WNU
1658	16835.0	16712.0	
1659	16835.5	16712.5	
1660	16836.0	16713.0	
1661	16836.5	16713.5	
1662	16837.0	16714.0	
1663	16837.5	16714.5	
1664	16838.0	16715.0	
1665	16838.5	16715.5	
1666	16839.0	16716.0	
1667	16839.5	16716.5	
1668	16840.0	16717.0	
1669	16840.5	16717.5	
1670	16841.0	16718.0	
1671	16841.5	16718.5	
1672	16842.0	16719.0	
1673	16842.5	16719.5	KEJ
1674	16843.0	16720.0	
1675	16843.5	16720.5	
1676	16844.0	16721.0	VCT
1677	16844.5	16721.5	
1678	16845.0	16722.0	
1679	16845.5	16722.5	
1680	16846.0	16723.0	
1681	16846.5	16723.5	
1682	16847.0	16724.0	
1683	16847.5	16724.5	
1684	16848.0	16725.0	

FREQUENCY LISTINGS

TELEX CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
1685	16848.5	16725.5	
1686	16849.0	16726.0	
1687	16849.5	16726.5	
1688	16850.0	16727.0	
1689	16850.5	16727.5	
1690	16851.0	16728.0	
1691	16851.5	16728.5	SAB
1692	16852.0	16729.0	
1693	16852.5	16729.5	
1694	16853.0	16730.0	
1695	16853.5	16730.5	
1696	16854.0	16731.0	
1697	16854.5	16731.5	
1698	16855.0	16732.0	
1699	16855.5	16732.5	
1700	16856.0	16733.0	
1701	16856.5	16733.5	
1702	16857.0	16739.0	
1703	16857.5	16739.5	
1704	16858.0	16740.0	
1705	16858.5	16740.5	
1706	16859.0	16741.0	
1707	16859.5	16741.5	
1708	16860.0	16742.0	
1709	16860.5	16742.5	
1710	16861.0	16743.0	
1711	16861.5	16743.5	
1712	16862.0	16744.0	
1713	16862.5	16744.5	
1714	16863.0	16745.0	
1715	16863.5	16745.5	
1716	16864.0	16746.0	
1717	16864.5	16746.5	
1718	16865.0	16747.0	
1719	16865.5	16747.5	
1720	16866.0	16748.0	
1721	16866.5	16748.5	
1722	16867.0	16749.0	
1723	16867.5	16749.5	
1724	16868.0	16750.0	

FREQUENCY LISTINGS

TELEX CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
1725	18868.5	16750.5	
1726	16869.0	16751.0	
1727	16869.5	16751.5	
1728	16870.0	16752.0	
1729	16870.5	16752.5	
1730	16871.0	16753.0	
1731	16871.5	16753.5	
1732	16872.0	16754.0	
1733	16872.5	16754.5	
1734	16873.0	16755.0	
1735	16873.5	16755.5	
1736	16874.0	16756.0	
1737	16874.5	16756.5	
1738	16875.0	16757.0	
1739	18875.5	16757.5	
1740	16876.0	16758.0	
1741	16876.5	16758.5	
1742	16877.0	16759.0	
1743	16877.5	16759.5	
1744	16878.0	16760.0	
1745	16878.5	16760.5	
1746	16879.0	16761.0	
1747	16879.5	16761.5	
1748	16880.0	16762.0	
1749	16880.5	16762.5	
1750	16881.0	16763.0	
1751	16881.5	16763.5	
1752	16882.0	16764.0	
1753	16882.5	16764.5	
1754	16883.0	16765.0	
1755	16883.5	16765.5	
1756	16884.0	16766.0	
1757	16884.5	16766.5	
1758	16885.0	16767.0	
1759	16885.5	16767.5	
1760	16886.0	16768.0	
1761	16886.5	16768.5	
1762	16887.0	16769.0	
1763	16887.5	16769.5	
1764	16886.0	16770.0	

FREQUENCY LISTINGS

TELEX CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
1765	16888.5	16770.5	
1766	16889.0	16771.0	
1767	16889.5	16771.5	
1768	16890.0	16772.0	
1769	16890.5	16772.5	
1770	16891.0	16773.0	
1771	16891.5	16773.5	
1772	16892.0	16774.0	
1773	16892.5	16774.5	
1774	16893.0	16775.0	
1775	16893.5	16775.5	
1776	16894.0	16776.0	
1777	16894.5	16776.5	
1778	16895.0	16777.0	
1779	16895.5	16777.5	
1780	16896.0	16778.0	
1781	16896.5	16778.5	
1782	16897.0	16779.0	
1783	16897.5	16779.5	
1784	16898.0	16780.0	
1785	16898.5	16780.5	
1786	16899.0	16781.0	
1787	16899.5	16781.5	
1788	16900.0	16782.0	
1789	16900.5	16782.5	
1790	16901.0	16783.0	
1791	16901.5	16783.5	
1792	16902.0	16784.0	
1793	16902.5	16784.5	
1794	16796.5	16796.5	
1795	16797.0	16797.0	
1796	16797.5	16797.5	
1797	16798.0	16798.0	
1798	16798.5	16798.5	
1799	16799.0	16799.0	
1800	16799.5	16799.5	
1801	19681.0	18870.5	
1802	19681.5	18871.0	
1803	19682.0	18871.5	
1804	19682.5	18872.0	

FREQUENCY LISTINGS

TELEX CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
1805	19683.0	18872.5	
1806	19683.5	18873.0	
1807	19684.0	18873.5	
1808	19684.5	18874.0	
1809	19685.0	18874.5	
1810	19685.5	18875.0	
1811	19686.0	18875.5	
1812	19686.5	18876.0	
1813	19687.0	18876.5	
1814	19687.5	18877.0	
1815	19688.0	18877.5	
1816	19688.5	18878.0	
1817	19689.0	18878.5	
1818	19689.5	18879.0	
1819	19690.0	18879.5	
1820	19690.5	18880.0	
1821	19691.0	18880.5	
1822	19691.5	18881.0	
1823	19692.0	18881.5	
1824	19692.5	18882.0	
1825	19693.0	18882.5	
1826	19693.5	18883.0	
1827	19694.0	18883.5	
1828	19694.5	18884.0	
1829	19695.0	18884.5	
1830	19695.5	18885.0	
1831	19696.0	18885.5	
1832	19696.5	18886.0	
1833	19697.0	18886.5	
1834	19697.5	18887.0	
1835	19698.0	18887.5	
1836	19698.5	18888.0	
1837	19699.0	18888.5	
1838	19699.5	18889.0	
1839	19700.0	18889.5	
1840	19700.5	18890.0	
1841	19701.0	18890.5	
1842	19701.5	18891.0	
1843	19702.0	18891.5	
1844	19702.5	18892.0	

FREQUENCY LISTINGS

TELEX CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
1845	19703.0	18892.5	
1871	18893.0	18893.0	
1872	18893.5	18893.5	
1873	18894.0	18894.0	
1874	18894.5	18894.5	
1875	18895.0	18895.0	
1876	18895.5	18895.5	
1877	18896.0	18896.0	
1878	18896.5	18896.5	
1879	18897.0	18897.0	
1880	18897.5	18897.5	
1881	18898.0	18898.0	
2201	22376.5	22284.5	
2202	22377.0	22285.0	WNU
2203	22377.5	22285.5	KFS
2204	22378.0	22286.0	
2205	22378.5	22286.5	
2206	22379.0	22287.0	
2207	22379.5	22287.5	
2208	22380.0	22288.0	
2209	22380.5	22288.5	KLC
2210	22381.0	22289.0	WLO
2211	22381.5	22289.5	
2212	22382.0	22290.0	
2213	22382.5	22290.5	KPH
2214	22383.0	22291.0	
2215	22383.5	22291.5	WLO
2216	22384.0	22292.0	
2217	22384.5	22292.5	KLC
2218	22385.0	22293.0	
2219	22385.5	22293.5	WNU
2220	22386.0	22294.0	
2221	22386.5	22294.5	WCC
2222	22387.0	22295.0	KLC
2223	22387.5	22295.5	
2224	22388.0	22296.0	
2225	22388.5	22296.5	
2226	22389.0	22297.0	

FREQUENCY LISTINGS

TELEX CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
2227	22389.5	22297.5	
2228	22390.0	22298.0	
2229	22390.5	22298.5	
2230	22391.0	22299.0	
2231	22391.5	22299.5	
2232	22392.0	22300.0	
2233	22392.5	22300.5	
2234	22393.0	22301.0	
2235	22393.5	22301.5	
2236	22394.0	22302.0	
2237	22394.5	22302.5	
2238	22395.0	22303.0	KPH
2239	22395.5	22303.5	
2240	22396.0	22304.0	KLB
2241	22396.5	22304.5	
2242	22397.0	22305.0	
2243	22397.5	22305.5	
2244	22398.0	22306.0	
2245	22398.5	22306.5	
2246	22399.0	22307.0	
2247	22399.5	22307.5	
2248	22400.0	22308.0	KLC
2249	22400.5	22308.5	
2250	22401.0	22309.0	
2251	22401.5	22309.5	
2252	22402.0	22310.0	WNU
2253	22402.5	22310.5	
2254	22403.0	22311.0	WLO
2255	22403.5	22311.5	
2256	22404.0	22312.0	WLO
2257	22404.5	22312.5	WNU
2258	22405.0	22313.0	
2259	22405.5	22313.5	
2260	22406.0	22314.0	WLO
2261	22406.5	22314.5	
2262	22407.0	22315.0	WLO
2263	22407.5	22315.5	
2264	22408.0	22316.0	
2265	22408.5	22316.5	
2266	22409.0	22317.0	

FREQUENCY LISTINGS

TELEX CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
2267	22409.5	22317.5	
2268	22410.0	22318.0	
2269	22410.5	22318.5	
2270	22411.0	22319.0	
2271	22411.5	22319.5	
2272	22412.0	22320.0	
2273	22412.5	22320.5	
2274	22413.0	22321.0	
2275	22413.5	22321.5	
2276	22414.0	22322.0	
2277	22414.5	22322.5	
2278	22415.0	22323.0	
2279	22415.5	22323.5	
2280	22416.0	22324.0	
2281	22416.5	22324.5	
2282	22417.0	22325.0	
2283	22417.5	22325.5	
2284	22418.0	22326.0	
2285	22418.5	22326.5	
2286	22419.0	22327.0	
2287	22419.5	22327.5	
2288	22420.0	22328.0	
2289	22420.5	22328.5	
2290	22421.0	22329.0	
2291	22421.5	22329.5	
2292	22422.0	22330.0	
2293	22422.5	22330.5	
2294	22423.0	22331.0	
2295	22423.5	22331.5	
2296	22424.0	22332.0	
2297	22424.5	22332.5	
2298	22425.0	22333.0	
2299	22425.5	22333.5	
2300	22426.0	22334.0	
2301	22426.5	22334.5	
2302	22427.0	22335.0	
2303	22427.5	22335.5	
2304	22428.0	22336.0	
2305	22428.5	22336.5	
2306	22429.0	22337.0	

FREQUENCY LISTINGS

TELEX CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
2307	22429.5	22337.5	
2308	22430.0	22338.0	
2309	22430.5	22338.5	
2310	22431.0	22339.0	
2311	22431.5	22339.5	
2312	22432.0	22340.0	
2313	22432.5	22340.5	
2314	22433.0	22341.0	
2315	22433.5	22341.5	
2316	22434.0	22342.0	
2317	22434.5	22342.5	
2318	22435.0	22343.0	
2319	22435.5	22343.5	
2320	22436.0	22344.0	
2321	22436.5	22344.5	
2322	22437.0	22345.0	
2323	22437.5	22345.5	
2324	22438.0	22346.0	
2325	22438.5	22346.5	
2326	22439.0	22347.0	
2327	22439.5	22347.5	
2328	22440.0	22348.0	
2329	22440.5	22348.5	
2330	22441.0	22349.0	
2331	22441.5	22349.5	
2332	22442.0	22350.0	
2333	22442.5	22350.5	
2334	22443.0	22351.0	
2335	22443.5	22351.5	
2371	22352.0	22352.0	
2372	22352.5	22352.5	
2373	22353.0	22353.0	
2374	22353.5	22353.5	
2375	22354.0	22354.0	
2376	22354.5	22354.5	
2377	22355.0	22355.0	
2378	22355.5	22355.5	
2379	22356.0	22356.0	
2380	22356.5	22356.5	

FREQUENCY LISTINGS

TELEX CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
2381	22357.0	22357.0	
2382	22357.5	22357.5	
2383	22358.0	22358.0	
2384	22358.5	22358.5	
2385	22359.0	22359.0	
2386	22359.5	22359.5	
2387	22360.0	22360.0	
2388	22360.5	22360.5	
2389	22361.0	22361.0	
2390	22361.5	22361.5	
2391	22362.0	22362.0	
2392	22362.5	22362.5	
2393	22363.0	22363.0	
2394	22363.5	22363.5	
2395	22364.0	22364.0	
2396	22364.5	22364.5	
2397	22365.0	22365.0	
2398	22365.5	22365.5	
2399	22366.0	22366.0	
2400	22366.5	22366.5	
2401	22367.0	22367.0	
2402	22367.5	22367.5	
2403	22368.0	22368.0	
2404	22368.5	22368.5	
2405	22369.0	22369.0	
2406	22369.5	22369.5	
2407	22370.0	22370.0	
2408	22370.5	22370.5	
2409	22371.0	22371.0	
2410	22371.5	22371.5	
2411	22372.0	22372.0	
2412	22372.5	22372.5	
2413	22373.0	22373.0	
2414	22373.5	22373.5	
2501	26101.0	25173.0	WLO
2502	26101.5	25173.5	
2503	26102.0	25174.0	
2504	26102.5	25174.5	
2505	26103.0	25175.0	

FREQUENCY LISTINGS

TELEX CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
2506	26103.5	25175.5	
2507	26104.0	25176.0	
2508	26104.5	25176.5	
2509	26105.0	25177.0	
2510	26105.5	25177.5	
2511	26106.0	25178.0	
2512	26106.5	25178.5	
2513	26107.0	25179.0	
2514	26107.5	25179.5	
2515	26108.0	25180.0	
2516	26108.5	25180.5	
2517	26109.0	25181.0	
2518	26109.5	25181.5	
2519	26110.0	25182.0	
2520	26110.5	25182.5	
2521	26111.0	25183.0	
2522	26111.5	25183.5	
2523	26112.0	25184.0	
2524	26112.5	25184.5	
2525	26113.0	25185.0	
2528	26113.5	25185.5	
2527	26114.0	25186.0	
2528	26114.5	25186.5	
2529	26115.0	25187.0	
2530	26115.5	25187.5	
2531	26116.0	25188.0	
2532	26116.5	25188.5	
2533	26117.0	25189.0	
2534	26117.5	25189.5	
2535	26118.0	25190.0	
2536	26118.5	25190.5	
2537	26119.0	25191.0	
2538	26119.5	25191.5	
2539	26120.0	25192.0	
2540	26120.5	25192.5	
2415	22374.0	22374.0	
2571	25193.0	25193.0	
2572	25193.5	25193.5	
2573	25194.0	25194.0	

FREQUENCY LISTINGS

TELEX CHANNEL	SHIP RECEIVE	SHIP TRANSMIT	USE
2574	25194.5	25194.5	
2575	25195.0	25195.0	
2576	25195.5	25195.5	
2577	25196.0	25196.0	
2578	25196.5	25196.5	
2579	25197.0	25197.0	
2580	25197.5	25197.5	
2581	25198.0	25198.0	
2582	25198.5	25198.5	
2583	25199.0	25199.0	
2584	25199.5	25199.5	
2585	25200.0	25200.0	
2586	25200.5	25200.5	
2587	25201.0	25201.0	
2588	25201.5	25201.5	
2589	25202.0	25202.0	
2590	25202.5	25202.5	
2591	25203.0	25203.0	
2592	25203.5	25203.5	
2593	25204.0	25204.0	
2594	25204.5	25204.5	
2595	25205.0	25205.0	
2596	25205.5	25205.5	
2597	25206.0	25206.0	
2598	25206.5	25206.5	
2599	25207.0	25207.0	
2600	25207.5	25207.5	
2601	25208.0	25208.0	

COAST STATIONS PROVIDING TELEX SERVICE

<u>CALL SIGN</u>	<u>STATION</u>	<u>SELCALL #</u>
KBS	Dutch Harbor, AK	1115
KLB	Seattle, WA	1113
KPH	San Francisco, CA	1091
KLC	Galveston, TX	1101
WLO	Mobile, AL	1090
WPD	Tampa, FL	1102
WCC	Chatham, MA	1092
VCT	St. John's, Newfoundland, Canada	1094
KEJ	Hawaii, Pacific Ocean	1094
KFS	Palo Alto (San Francisco, CA)	1094
SAB	Gothenburg, Sweden	1094
ZLA	Awanui, New Zealand	1094
VIP	Perth, Western Australia	1094
WNU	Slidell, New Orleans, LA	1094

SEA SCRATCH PAD MEMORY LISTING

<u>BIN #</u>	<u>RX FREQUENCY</u>	<u>TX FREQUENCY</u>	<u>MODE</u>	<u>NAME TAG</u>
1	2500.0	---	TAM	[WWV 1]
2	5000.0	---	TAM	[WWV 2]
3	10000.0	---	TAM	[WWV 3]
4	15000.0	---	TAM	[WWV 4]
5	20000.0	---	TAM	[WWV 5]
6	2182.0	2182.0	USB	[EMER 1]
7	2142.0	2142.0	USB	[SAFTY 2]
8	4125.0	4125.0	USB	[SAFTY 4]
9	6215.0	6215.0	USB	[SAFTY 6]
10	8291.0	8291.0	USB	[SAFTY 8]
11	12290.0	12290.0	USB	[SAFTY12]
12	16420.0	16420.0	USB	[SAFTY16]
13	2450.0	2003.0	USB	[KMI 242]
14	2506.0	2406.0	USB	[KMI 248]
15	4357.0	4065.0	USB	[KMI 401]
16	4402.0	4110.0	USB	[KMI 416]
17	4405.0	4113.0	USB	[KMI 417]
18	8728.0	8204.0	USB	[KMI 804]
19	8743.0	8219.0	USB	[KMI 809]
20	8782.0	8258.0	USB	[KMI 822]
21	13077.0	12230.0	USB	[KMI1201]
22	13080.0	12233.0	USB	[KMI1202]
23	13083.0	12236.0	USB	[KMI1203]
24	17245.0	16363.0	USB	[KMI1602]
25	17248.0	16366.0	USB	[KMI1603]
26	17311.0	16429.0	USB	[KMI1624]
27	22735.0	22039.0	USB	[KMI2214]
28	22762.0	22066.0	USB	[KMI2223]
29	22777.0	22081.0	USB	[KMI2228]
30	22801.0	22105.0	USB	[KMI2236]
31	2490.0	2031.5	USB	[WOM 209]
32	2514.0	2118.0	USB	[WOM 221]
33	2566.0	2390.0	USB	[WOM 245]
34	2442.0	2406.0	USB	[WOM 247]

FREQUENCY LISTINGS

<u>BIN #</u>	<u>RX FREQUENCY</u>	<u>TX FREQUENCY</u>	<u>MODE</u>	<u>NAME TAG</u>
35	4363.0	4071.0	USB	[WOM 403]
36	4390.0	4098.0	USB	[WOM 412]
37	4405.0	4113.0	USB	[WOM 417]
38	4423.0	4131.0	USB	[WOM 423]
39	8722.0	8198.0	USB	[WOM 802]
40	8731.0	8207.0	USB	[WOM 805]
41	8746.0	8222.0	USB	[WOM 810]
42	8758.0	8234.0	USB	[WOM 814]
43	8791.0	8267.0	USB	[WOM 825]
44	8809.0	8285.0	USB	[WOM 831]
45	13092.0	12245.0	USB	[WOM1206]
46	13098.0	12251.0	USB	[WOM1208]
47	13101.0	12254.0	USB	[WOM1209]
48	13119.0	12272.0	USB	[WOM1215]
49	13143.0	12296.0	USB	[WOM1223]
50	13164.0	12317.0	USB	[WOM1230]
51	17242.0	16360.0	USB	[WOM1601]
52	17266.0	16384.0	USB	[WOM1609]
53	17269.0	16387.0	USB	[WOM1610]
54	17272.0	16390.0	USB	[WOM1611]
55	17287.0	16405.0	USB	[WOM1616]
56	22738.0	22042.0	USB	[WOM2215]
57	22741.0	22045.0	USB	[WOM2216]
58	22759.0	22063.0	USB	[WOM2222]
59	2558.0	2166.0	USB	[WOO 232]
60	2450.0	2366.0	USB	[WOO 242]
61	4384.0	4092.0	USB	[WOO 410]
62	4387.0	4095.0	USB	[WOO 411]
63	4402.0	4110.0	USB	[WOO 416]
64	4420.0	4128.0	USB	[WOO 422]
65	8740.0	8216.0	USB	[WOO 808]
66	8749.0	8225.0	USB	[WOO 811]
67	8761.0	8237.0	USB	[WOO 815]
68	8794.0	8270.0	USB	[WOO 826]

FREQUENCY LISTINGS

<u>BIN #</u>	<u>RX FREQUENCY</u>	<u>TX FREQUENCY</u>	<u>MODE</u>	<u>NAME TAG</u>
69	13083.0	12236.0	USB	[WOO1203]
70	13104.0	12257.0	USB	[WOO1210]
71	13107.0	12260.0	USB	[WOO1211]
72	13158.0	12311.0	USB	[WOO1228]
73	17254.0	16372.0	USB	[WOO1605]
74	17299.0	16417.0	USB	[WOO1620]
75	17317.0	16435.0	USB	[WOO1626]
76	17332.0	16450.0	USB	[WOO1631]
77	22696.0	22000.0	USB	[WOO2201]
78	22708.0	22012.0	USB	[WOO2205]
79	22723.0	22027.0	USB	[WOO2210]
80	22801.0	22105.0	USB	[WOO2236]
81	2065.0	2065.0	USB	[BUSOP 1]
82	2079.0	2079.0	USB	[BUSOP 2]
83	2096.5	2096.5	USB	[BUSOP 3]
84	3023.0	---	USB	[BUSOP 4]
85	4125.0	4125.0	USB	[BUSOP 5]
86	4146.0	4146.0	USB	[BUSOP 6]
87	4149.0	4149.0	USB	[BUSOP 7]
88	4417.0	4417.0	USB	[BUSOP 8]
89	5680.0	---	USB	[BUSOP 9]
90	6224.0	6224.0	USB	[BUSOP10]
91	6227.0	6227.0	USB	[BUSOP11]
92	6230.0	6230.0	USB	[BUSOP12]
93	6518.0	6516.0	USB	[BUSOP13]
94	8294.0	8294.0	USB	[BUSOP14]
95	8297.0	8297.0	USB	[BUSOP15]
96	12353.0	12353.0	USB	[BUSOP16]
97	12356.0	12356.0	USB	[BUSOP17]
98	12359.0	12359.0	USB	[BUSOP18]
99	16528.0	16528.0	USB	[BUSOP19]
100	16531.0	16531.0	USB	[BUSOP20]
101	16534.0	16534.0	USB	[BUSOP21]
102	18840.0	18840.0	USB	[BUSOP22]

FREQUENCY LISTINGS

<u>BIN #</u>	<u>RX FREQUENCY</u>	<u>TX FREQUENCY</u>	<u>MODE</u>	<u>NAME TAG</u>
103	18843.0	18843.0	USB	[BUSOP23]
104	22159.0	22159.0	USB	[BUSOP24]
105	22162.0	22162.0	USB	[BUSOP25]
106	22165.0	22165.0	USB	[BUSOP26]
107	22168.0	22168.0	USB	[BUSOP27]
108	22171.0	22171.0	USB	[BUSOP28]
109	25115.0	25115.0	USB	[BUSOP29]
110	25118.0	25118.0	USB	[BUSOP30]
111	4344.1	---	USB	[PACWFX1]
112	8680.1	---	USB	[PACWFX2]
113	12728.1	---	USB	[PACWFX3]
114	4853.1	---	USB	[HIWFX 1]
115	9980.6	---	USB	[HIWFX 2]
116	11088.1	---	USB	[HIWFX 3]
117	16133.1	---	USB	[HIWFX 4]
118	21783.1	---	USB	[HIWFX 5]
119	8502.0	---	USB	[CGWFX 1]
120	12748.1	---	USB	[CGWFX 2]
121	4317.9	---	USB	[VAWFX 1]
122	8078.1	---	USB	[VAWFX 2]
123	10863.1	---	USB	[VAWFX 3]
124	12788.0	---	USB	[GLFWFX1]
125	17146.4	---	USB	[GLFWFX2]
126	3355.1	---	USB	[ATLWFX1]
127	9108.1	---	USB	[ATLWFX2]
128	15957.1	---	USB	[ATLWFX3]
129	20013.1	---	USB	[ATLWFX4]
130	6338.6	---	USB	[MAWFX 1]
131	8492.1	---	USB	[AKWFX 1]
132	5451.1	---	USB	[CAWFX 1]
133	9088.1	---	USB	[CAWFX 2]
134	4266.1	---	USB	[BCWFX 2]
135	6454.1	---	USB	[BCWFX 3]
136	12751.1	---	USB	[BCWFX 4]

FREQUENCY LISTINGS

<u>BIN #</u>	<u>RX FREQUENCY</u>	<u>TX FREQUENCY</u>	<u>MODE</u>	<u>NAME TAG</u>
137	4269.1	---	USB	[NSWFX 1]
138	6495.1	---	USB	[NSWFX 2]
139	10534.1	---	USB	[NSWFX 3]
140	13508.1	---	USB	[NSWFX 4]
141	13282.0	---	USB	[HIVWX 1]
142	13270.0	---	USB	[NYVWX 1]
143	2054.0	2054.0	USB	[SHIP 1]
144	2065.0	2065.0	USB	[SHIP 2]
145	2079.0	2079.0	USB	[SHIP 3]
146	2082.5	2082.5	USB	[SHIP 4]
147	2086.0	2086.0	USB	[SHIP 5]
148	2093.0	2093.0	USB	[SHIP 6]
149	2096.5	2096.5	USB	[SHIP 7]
150	2115.0	2115.0	USB	[SHIP 8]
151	2134.0	2134.0	USB	[SHIP 9]
152	2638.0	2638.0	USB	[SHIP 10]
153	2738.0	2738.0	USB	[SHIP 11]
154	2118.0	2118.0	USB	[SHPCAN1]
155	2003.0	2003.0	USB	[ALSKA 1]
156	2006.0	2006.0	USB	[ALSKA 2]
157	2182.0	2182.0	USB	[ALSKA 3]
158	2203.0	2203.0	USB	[ALSKA 4]
159	2419.0	2419.0	USB	[ALSKA 5]
160	2422.0	2422.0	USB	[ALSKA 6]
161	2427.0	2427.0	USB	[ALSKA 7]
162	2430.0	2430.0	USB	[ALSKA 8]
163	2447.0	2447.0	USB	[ALSKA 9]
164	2450.0	2450.0	USB	[ALSKA10]
165	2479.0	2479.0	USB	[ALSKA11]
166	2482.0	2482.0	USB	[ALSKA12]
167	2506.0	2506.0	USB	[ALSKA13]
168	2509.0	2509.0	USB	[ALSKA14]
169	2527.0	2527.0	USB	[ALSKA15]
170	2535.0	2535.0	USB	[ALSKA16]

FREQUENCY LISTINGS

<u>BIN #</u>	<u>RX FREQUENCY</u>	<u>TX FREQUENCY</u>	<u>MODE</u>	<u>NAME TAG</u>
171				
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SEA SCRATCH PAD WORKSHEET

<u>BIN #</u>	<u>RX FREQUENCY</u>	<u>TX FREQUENCY</u>	<u>MODE</u>	<u>NAME TAG</u>
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FREQUENCY LISTINGS

<u>BIN #</u>	<u>RX FREQUENCY</u>	<u>TX FREQUENCY</u>	<u>MODE</u>	<u>NAME TAG</u>
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SSB PROPAGATION TABLES

TYPICAL FREQUENCY PROPAGATION: SPRING AND SUMMER

BAND	4 MHz		8 MHz		12 MHz		16 MHz		22 MHz	
Propagation (Miles)										
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Hours after sunset										
1	50	250	200	1000	500	3500	750	6000	1500	7000
2	100	600	250	1500	500	3500	750	6000		
3	100	600	250	2000	500	3500				
4	100	800	250	2500						
5	100	1000	250	2500						
6	100	1500	400	3000						
7	100	1500	500	3500						
8	250	2000	750	4000						
9	250	2500	750	4000						
10	250	2500	750	4000						
11	100	1000	500	2500						
Hours after sunrise										
1	100	500	400	2000						
2	0	100	400	2000						
3	0	100	250	1500						
4	0	100	250	1500	500	1000				
5	0	100	250	1500	500	1500				
6	0	100	250	1500	500	2500	750	4000		
7	0	100	250	2500	500	3500	750	4000	1500	7000
8	0	100	250	1500	500	3500	750	4000	1500	7000
9	0	100	250	1500	500	3500	750	4000	1500	7000
10	0	100	250	1500	500	3500	750	4000	1500	7000
11	0	100	150	500	500	3500	750	6000	1500	7000
12	0	200	150	500	500	3500	750	6000	1500	7000
13	50	250	150	750	500	3500	750	6000	1500	7000

SSB PROPAGATION TABLES (Cont.)

TYPICAL FREQUENCY PROPAGATION: FALL AND WINTER

BAN D	4 MHz		8 MHz		12 MHz		16 MHz		22 MHz	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Propagation (Miles)										
Hours after sunset										
1	100	600	400	2000	500	3500	750	6000	1500	7000
2	100	800	400	2000	500	4000	750	6000		
3	100	1000	400	2000	500	4000				
4	100	1000	400	2500	500	4000				
5	100	1000	400	3000	500	4000				
6	100	1500	400	3500						
7	250	2000	400	4000						
8	250	2500	500	4000						
9	500	3000	500	4000						
10	500	4000	500	4000						
11	500	3000	750	5000						
12	250	2500	750	5000						
13	250	1500	500	2500						
Hours after sunrise										
1	100	1000	400	2000						
2	100	500	400	2000						
3	0	100	400	2000	500	3500	750	4000		
4	0	100	400	2000	500	3500	750	4000	1500	3000
5	0	100	250	1500	500	3500	750	4000	1500	4000
6	0	100	250	1500	500	3500	750	4000	1500	5000
7	0	100	250	1500	500	4000	750	5000	1500	6000
8	0	100	250	1500	500	4000	750	5000	1500	7000
9	0	100	250	1500	500	4000	750	6000	1500	7000
10	0	100	250	1000	500	3500	750	6000	1500	7000
11	0	250	250	1500	500	3500	750	6000	1500	7000

REAR PANEL CONNECTIONS

POWER CONNECTOR:

Connect to a power supply that delivers 13.6 volts DC (245), or 24 volts DC (245-24), and is capable of 30 Amps intermittent current. -24VDC input is isolated from chassis GND.

RF CONNECTOR:

Type UHF female connector for interconnecting a 50 ohm coax to the antenna system. Coax type should be RG-58C/U, RG-213/U or equivalent using a PL-259 UHF plug.

SEABUSS INTERFACE - P1:

Interconnect for connecting the optional SEA 2450 remote controller(s). Standard SEABUSS interconnect cable is used and up to 150 feet (50 meters) of cable is permitted between the SEA 245 and the SEA 2450 controller(s).

GND	(Pins 1 and 9) Chassis common ground. Used for DC power return and termination of shield braids. (245-24: -24V main supply is isolated from all chassis GND terminals, not to be connected to chassis common GND.)
12VSW	(Pin 2) 12 volts, switched. Normally used to power an external antenna tuner such as the SEA 1612C. DO NOT EXCEED 3 AMPS. Fused with a 5 amp fuse located on the PA/Filter board.
PTT	(Pin 3) PTT line for radiotelephone. Connecting this terminal to ground places the radiotelephone in transmit.
DATA	(Pins 4 and 5) Balanced data lines. Approximately RS485 format, differential logic. Use a shielded, twisted pair.
AF	(Pins 6 and 7) Balanced, bi-directional audio lines. Nominal audio level is approximately 1 volt peak-to-peak. Use a shielded twisted pair.
N/C	(Pin 8)

DB-9 COMPUTER INTERFACE - RS232:

Standard RS232 Port, the DB-9 connector is configured as a RS232 based SEABUSS interface and is compatible with the GLOBELINK E-Mail system.

N/C	(Pin 1, 4 and 9) No connect
RXD	(Pin 2) Serial data RECEIVER pin for RS232 port.
TXD	(Pin 3) Serial data TRANSMITTER pin for RS232 port.
GND	(Pin 5) RS232 port ground pin.
DSR	(Pin 6) Data Set Ready.
RTS	(Pin 7) Request To Send
CTS	(Pin 8) Clear To Send

REAR PANEL CONNECTIONS (cont.)**ACCESSORY CONN - P2:**

Use for interconnecting additional equipment requiring accesses to the radio transmit and receive circuitry along with tuner connections.

GND	(Pins 1 and 8) Provides access to the negative side (ground) of the +13.6 primary supply (-24V Floats N/C). Also common to chassis.
2187.5 ANT	(Pin 2) DSC Watch Receiver antenna input.
TXAF	(Pin 3) Input for an alternative transmitter audio source such as a MODEM. Configured for unbalanced 600 ohm lines. Nominal input level for full modulation is 1 volt peak-to-peak
LLAF	(Pin 4) Low level receiver audio output (unscelched). Configured for unbalanced 300 ohm lines, nominal output level is 1 volt peak-to-peak.
DMD TUNE	(Pin 5) This output terminal provides the connection to operate the "DEMAND TUNE" function in the SEA 1635 and SEA 1612C.
TND	(Pin 6) Input signal from the tuner to indicate a "matched" antenna. Grounding this line will cause the "TND" indicator to display.
12VSW	(Pin 7) 12 volts switched from the transceiver.
SPKR	(Pin 9) Internal speaker input. A jumper to the AF terminal is required to operate the internal speaker.
AF	(Pin 10) AC coupled output of the audio power amplifier. Speaker impedance required is 3.2 ohms or greater.
HANDSET	(Pin 11) Handset receiver audio. 600 ohms.
MIC	(Pin 12) Auxiliary input for a dynamic microphone.
PTT	(Pin 13) Applying a ground potential to this connection activates the transmitter.

ALARM/NMEA – P3:

Use for interconnecting additional equipment requiring accesses to the radio, like GPS and Remote Distress Alarm.

GND	(Pin 1) Chassis Common Ground
Alarm RQ In	(Pin 2) Remote Distress Alarm switch output, Ground for 5 seconds to send.
Alarm Ack Out	(Pin 3) Logic level output to acknowledge distress send.
12VSW	(Pin 4) 12 volts, switched.
HI NMEA In	(Pin 5) Geographic position input from external GPS.
Low NMEA In	(Pin 6) Geographic position input from external GPS
Hi NMEA Out	(Pin 7) Loop-thru output of position Data
Low NMEA Out	(Pin 8) Loop-thru output of position Data

REMOTE POWER ON – P12:

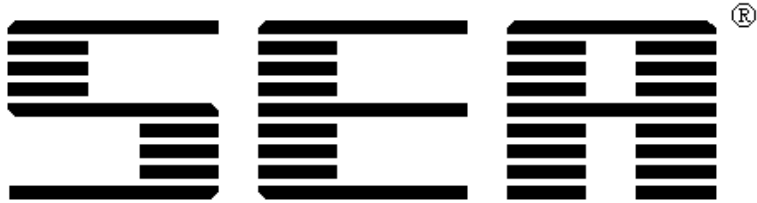
Used to switch power on the RT (2451) unit by one Master Remote (2450) in 245R configuration.

PS1	(Pin 1) Switch+ Power for Master Remote power on (2450).
PS2	(Pin 2) Switch- Power for Master Remote power on (2450).

GLOSSARY

This manual assumes basic HF SSB radiotelephone knowledge. Below are definitions of acronyms used in the operating instructions.

<u>AF</u> :	A udio F requency
<u>AGC</u> :	Used in the receiver of a radio, the A utomatic G ain C ontrol adjusts the radio circuitry to compensate for large and small signals.
<u>ALC</u> :	A utomatic L evel C ontrol keeps the transmit power from overshooting.
<u>AME</u> :	Only used for 2182.0 KHz, A mplitude M odulation E quivalent allows a single side band radio to be intelligently heard on an older AM marine radio.
<u>Bin / Channel</u> :	A number assigned to a pair (transmit / receive) of frequencies stored in the radio memory. While both are pre programmed, for the purpose of this manual, ' <u>Channels</u> ' are permanent in memory and cannot be changed by the operator. ' <u>Bins</u> ' are channels that can be programmed by the operator.
<u>Carrier</u> :	A reference frequency for a channel. Normally 0 Watts for SSB transmissions. AME uses a 40 Watt carrier and R3J uses a 5 Watt carrier.
<u>DSC</u> :	D igital S elective C alling is a more advanced NECODE system.
<u>DUPLEX</u> :	A channel using different transmit and receive frequencies.
<u>ITU</u> :	I nternational T elecommunications U ion.
<u>KHz</u> :	K ilo (thousand) H ertz. Commonly used when referring to a single HF frequency such as 2182.0 KHz.
<u>LSB</u> :	The opposite of USB is L ower S ide B and and not allowed for marine use.
<u>MHz</u> :	M ega (million) H ertz. Typically used when referring to a band of frequencies such as '4 MHz band'.
<u>NECODE</u> :	A signaling device for calling a specific station also using NECODE.
<u>R.I.T.</u> :	R eceiver I ncremental T uning allows changing the receiver frequency.
<u>SQUELCH</u> :	A circuit that mutes the speaker when no signal is present.
<u>SSB</u> :	S ingle S ide B and. The carrier is removed along with one sideband.
<u>TELEX</u> :	Data communications that requires a special modem connected to a computer and the radio. Abbreviated as TLX or TLX-GW for Globe Wireless.
<u>TUNER</u> :	Also known as a coupler, this device matches the antenna to the radio for maximum radiated power.
<u>USB</u> :	The modulation method for a marine HF SSB radio is U pper S ide B and.
<u>VOGAD</u> :	A V oice O perated G ain A djustment D evice used in the microphone audio circuit.
<u>VSWR</u> :	V oltage S tanding W ave R atio, this measurement figure helps determine how well the radio is matched to the antenna system.



SEA COM Corp.
7030 220th St. S.W.
Mountlake Terrace, WA 98043
USA

(425) 771-2182
FAX: (425) 771-2650
www.seacomcorp.com