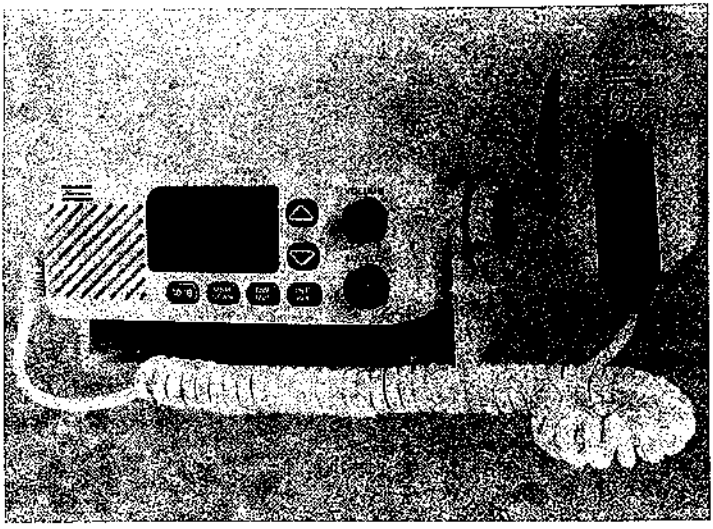
SE 2510

MARINE VHF RADIO



OWNER'S MANUAL

Shakespeare

READ ME FIRST

Should you encounter any problems with your product

DO NOT RETURN THIS PRODUCT TO THE STORE

- Please read the manual carefully. If you still need assistance, call 1-800-800-9008 and request Marine Electronics Technical Support.

  Before calling, get the following information ready for the Technical Support representative.

  - Model number
  - Date of purchase
  - Your name and address
  - Serial number
  - Place of purchase
  - A daytime phone number

- Describe the problem as accurately as possible and tell the Technical Support representative what you may have done to try to solve the problem.

- The Technical Support representative will make every effort to resolve the problem as quickly and efficiently as possible.

- **KEEP ALL PACKING MATERIAL AND CARTON FOR FUTURE TRANSPORTING**

Cut along the line and attach the section below to the product

In the rare event you must return this product after talking with Technical Support, you **MUST** complete this form in detail and place it in the box with the product.

Model #:_____ Serial #:_____ Purchase Date:_____ Return Date:_____

Owner's Name:_____ Home Phone:( ) _____

Address:_____ Day Phone: ( ) _____

_____ Fax: ( ) _____

_____

Place of Purchase:_____

Reason for Return (be specific - must be filled out or product will not be accepted)_____

_____

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Cut along the line and use the section below as your shipping label

_____

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RMA #_____

Shakespeare, Company
Electronics and Fiberglass Division
19845 US Highway 76
Newberry, SC 29108

TABLE OF CONTENTS

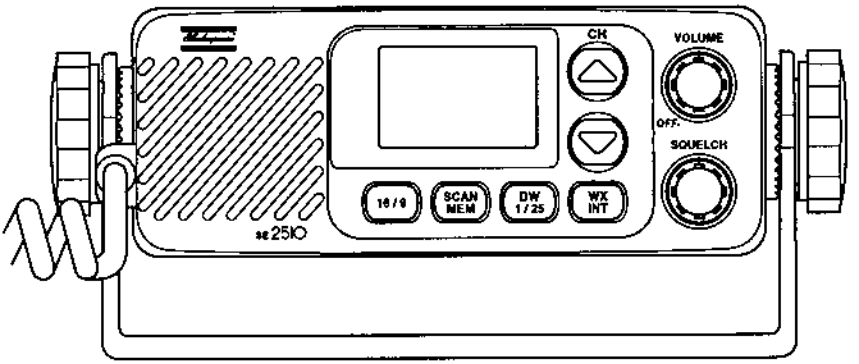


Figure 1-1 Shakespeare SE2510 Marine VHF Radio

1.0 INTRODUCTION

Welcome and congratulations on your purchase of the Shakespeare SE2510 Marine VHF radio. You have purchased a high technology piece of marine electronics, certified waterproof by meeting tough Coast Guard CFR-46 testing requirements and fully backed by the Shakespeare name. The SE2510 Marine VHF radio incorporates modern, compact styling and functionality. Ease of operation makes your boating communications totally professional and pleasing.

The frequency synthesized transceiver provides access to ALL usable USA and International Channels, as well as 10 Weather Channels. Enhanced features like Channel 16/9 priority, Weather Alert, three types of scanning modes, coupled to a large LCD display simply makes the SE2510 the best value in marine VHF radios on the market today.

The key to obtain the most use and pleasure from your new VHF radio, is reading the Owner's Manual. This manual teaches you proper transceiver procedures and ensure many years of satisfying use. It is especially important to cover the section pertaining to "License Requirements" established by the Federal Communication Commission (FCC).

1.1 Purpose

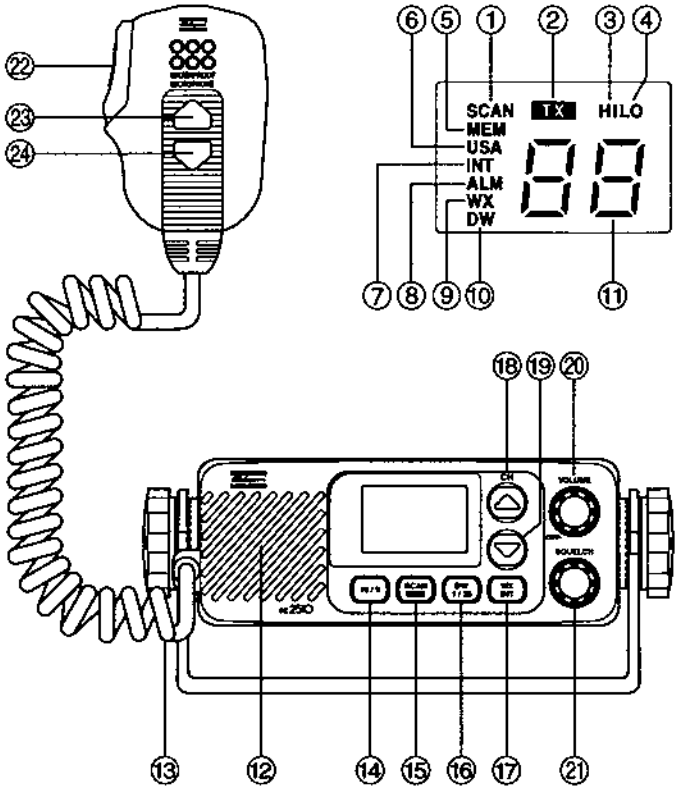
The SE2510 Owner's Manual is designed to answer your questions about proper installation and operation of your radio. Many new user pitfalls can be avoided by reading through each section of this manual before attempting to install or operate your radio. The "Brief Operating" section assures you are on the air quickly and properly.

1.2 Equipment Description

The Shakespeare SE2510 Marine VHF is one of the smallest, most compact 25W radios available in the world today. The digitally frequency synthesized transceiver is constructed of only the highest grade mechanical and solid state electronic components. Advanced microprocessor control, integrated RF circuit technology, and large high-contrast LCD allows operational features not possible until now in such a compact unit. This full 25W radio can easily fit behind the steepest sloped windshield or be completely in-dash mounted with the Shakespeare optional Flush Mount Kit.

1.3 Brief Operating Instructions

Use the following brief operation instructions to quickly refresh your memory when using the Shakespeare SE2510 Marine VHF radio. Please remember that this section is not designed to replace a thorough study of the Owner's Manual.



1-Scan active indicator
2-Transmit active indicator
3-Hi Output power indicator
4-Lo Output power indicator
5-Memory channel indicator
6-USA channel indicator
7-International channel indicator
8-Weather Alert indicator
9-Weather channel indicator
10-Dual Watch active indicator
11-Active channel readout
12-Speaker
13-Microphone cable
14-16/9 Priority select key
15-Scan & Memory select key
16-Dual Watch & Transmit power select key
17-USA/International channel & Weather mode select key
18-Up channel select key
19-Down channel select key
20-On/Off/Volume knob
21-Squelch knob
22-PTT (Push-To-Talk) key
23-Up channel select key (MIC)
24-Down channel select key (MIC)

1.4 Technical Specifications

General

Compliance:	FCC Part 80, ITU Radio Regulations Appendix 18. DOC CATV RSS-182 Issue 2.
Waterproofness:	Radio and Microphone Meets Coast Guard CFR-46 Waterproof Testing Specifications.
Temperature Range:	-20℃ to +50℃
Construction:	UV Stable Plastic Front with Die-Cast Aluminum Rear Chassis
Speaker:	Sealed Water Resistant Polypropylene
Microphone:	Sealed with non-slip gasketing. Tactile-Feel PTT Switch and Silicon Rubber UP/DOWN Channel change keys. Special styled internal electret mike element.
Size (WxHxD):	5.6" x 2.2" x 4.9".
Weight:	2 Lbs.
Number of Channels:	120 Total, 55 USA/55 INT'L (per Appendix 18), 10 Wx.
Channel Display:	*Extra Large* LCD with backlighting.
Keypad:	Silicon Rubber Keypad with Individual Tactile-Feel Switches.
Squelch Control:	Manual Knob.
Volume Control:	Manual Knob.
Frequency Control Method:	Phased Locked Loop (PLL).
Rated Input Voltage/Current:	13.8 VDC. Current drain - 5.5Amps @ 25W & 1.3 Amps @ 1W.
Power Source Protection:	Series Diode Reverse Polarity Protection.
Fuse Rating:	10A In-line.
Antenna Impedance:	50 Ω . Mates with standard PL-259 connector. Chassis. Grounded.
Frequency Stability:	+/-10 PPM for both the Transmitter/Receiver.
Special Functions:	MRU Memory, Channel 16/09 Priority Channel Selection, Wx Alert, Memory Scan, All Scan, and Dual Watch.
Warranty:	3 Years.

TRANSMITTER

Power Output:	25W/1W switchable.
Modulation:	16F3 for 100%
Transmit Frequencies:	156.025Mhz - 157.425Mhz @ 25Khz spacing, 55 Channels total.
Spurious/Harmonic Emissions:	43 + 10 Log_{10} (Power) or 25μW, whichever is Greater.

Modulation Distortion:	Less than 10 % @ 1Khz for a +/-3Khz deviation.
Modulation Limiter:	5Khz deviation at 100% modulation
Frequency Response:	Matching a +6dB/Octave slope within +1/-3dB from 300 to 2500Hz. Audio Low Pass Filter is included.
Hum & Noise:	Less than -40dB.

RECEIVER

Receive Frequencies:	156.025Mhz - 163.275Mhz @ 25Khz spacing, 87 Channels total.
Sensitivity:	0.30µV or less for 12dB SINAD.
Squelch Range:	0.30µV to 0.80µV @ full squelch.
Receiver Current:	.2Amps in Standby
IF Frequencies:	1st IF 21.6Mhz. 2nd IF 455Khz.
Adjacent Channel Selectivity:	Greater than -70dB for +/-25Khz.
Image Rejection:	Greater than -70dB.
Intermodulation	
Spurious Response:	Greater than -70dB.
Noise Level:	Greater than -40dB unsquelched.
Audio Frequency Response:	Matching a -6dB/Octave slope within +1/-3dB from300 to 2500Hz.
Audio Output Power:	3W minimum @ 4 Ω with less than 10% distortion. External speaker *works with* internal speaker.

Specifications are subject to change without notice and are nominal unless otherwise indicated.

1.5 Supplied Parts

SE2510 Radio Transceiver
Mike Clip with screws
Mounting Knobs
Washers (2)
Mounting Bracket
Cable Assembly with fuse holder
Owner's Manual
Warranty Card
FCC Application-506

1.6 License Requirements

Pleasure boats (U.S. vessels), equipped with a marine radio, must have a Ship Station License. Other vessels (including compulsory equipped vessels) may require a Ship Radio Station License and a Commercial Radio Operator's License to operate the radio station. If the ship is not a U.S. vessel, contact the local authorities to determine licensing requirements.

When purchasing a new boat, you must apply for a new non-transferable "Ship Station License" from the FCC. Therefore, upon the sale of your boat, the FCC requires that you submit your old license for cancellation.

A change in mailing address requires notification to be filed with the FCC. This notification is mailed to:

Federal Communications Commission
P.O. Box 1040
Gettysburg, PA 17326

1.6.1 License Application

The Ship Radio Station License is obtained by filling out and submitting the enclosed Form 506 with $75.00 to the FCC. DO NOT SEND CASH. This fee currently covers a 10-year period. If you have any questions about this fee or latest FCC rulemaking updates, contact the FCC Information Center at 1-800-322-1117 for details. To operate the radio while waiting for the license to be returned from the FCC, fill out and keep enclosed Form 506A. This "Temporary Permit" is valid for 90 days from the date Form 506 is mailed to the FCC. The Temporary Permit has instructions for assigning the vessel's temporary call sign. The call sign for your station will be issued by the FCC on your official license.

If the ship's radio station is to be operated in other countries, contact the local authorities for their licensing requirements.

Mail Station License Application form to :

Federal Communications Commission
Marine Ship Service
P.O. Box 358275
Pittsburgh, PA 15251-5275

2.0 INSTALLATION

Before using the Shakespeare SE2510 Marine VHF radio, please study the following section. Failure to adhere to these installation and operating considerations can damage or significantly degrade the performance of your VHF radio, as well as void the warranty.

2.1 Unpacking And Inspection

The Shakespeare SE2510 Marine VHF radio comes to you 100% inspected. When unpacking, check the parts shipped with the unit against the supplied parts list. If there is a discrepancy, notify your selling agent or Shakespeare Customer Service (1-803-276-5504).

If the radio was damaged during shipment, save ALL packing material to make it easier to file a claim with the carrier. All damage claims from shipment must be filed with the freight carrier used to ship the radio to you within 10 days.

2.2 Mounting Preparation

Before actually mounting your new SE2510 Marine VHF radio, take a little time to read over the installation instructions. You will find there are many things to take into consideration before drilling that first hole. Planning every aspect of the installation first will save time and aggravation. It will also save money by cutting down potential errors that require repair to correct.

Before mounting begins, you will need to purchase a marine VHF radio antenna. Shakespeare markets a full line of high quality marine VHF radio antennas to fit every installation. The dealer you purchased this radio from will be able to help you choose the antenna style best suited to your type of boating.

2.3 Mounting Location Selection

The following is a list of items that need advanced planning before selection of the mounting location.

1. Find where the vessel's +12 volt supply and ground are located and what it will take to get the radio power cable assembly to it.

2. Where can the antenna be mounted and what must be done to route the antenna cable to the radio?

NOTE

Keep the antenna at least 3 feet away from the radio and as high as possible for best performance.

3. Where is the best place to mount the radio itself? Keep in mind that the radio may be table top mounted, hang mounted overhead, bulkhead mounted vertically, or under counter mounted.

4. When deciding on a mounting location, visibility of the front panel, access to the front panel controls, access to the mounting knobs, room for rear cable connections and access to rear cable connections must be addressed and planned.

2.4 Unit Mechanical Installation

Once a mounting location had been chosen, hold the mounting bracket at the place where the unit is to be mounted. Use the mounting bracket as a template to mark the places to drill holes for the mounting screws.

To mount the bracket to wood use stainless steel wood screws. If the unit is to be mounted on fiberglass, use stainless steel nuts and through bolts as the vibrations found on most pleasure boats will loosen self-tapping screws mounted directly into fiberglass.

When the mounting bracket is secured, attach the SE2510 to the bracket using the mounting knobs and washers supplied with the unit. The washers should be inserted between the bracket and knobs.

2.5 Electrical Connections

The back panel of the SE2510 comes with the following standard connections.

1. Power/External Speaker Cable
2. Antenna Connector (for PL-259 type connections)

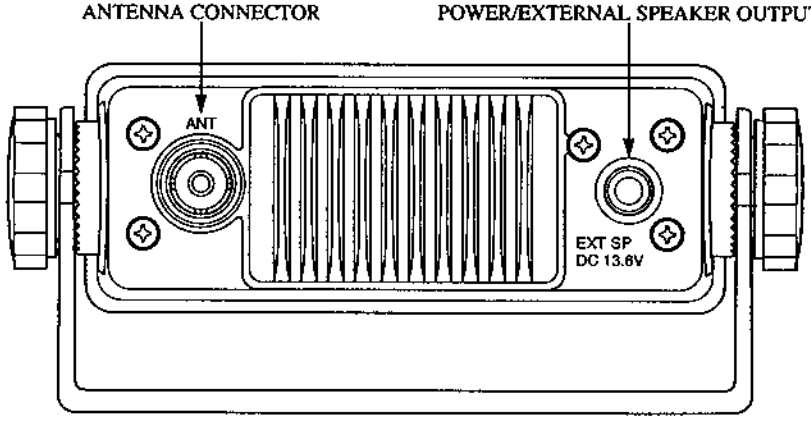


Figure 2-1 Rear panel electrical connections

2.5.1 Power Hookup

The SE2510 is supplied with a cable assembly. The cable assembly has 4 wires, **Red** (+) and **Black** (-) for power and **Yellow** (+) and **Green** (-) for an external speaker. The free end of the **Red** (+) wire and **Black** (-) wire is connected to the battery side of the vessel's +12 volt power buss. The **Red** (+) wire is equipped with a 10-Amp special "Spring" style in-line fuse holder for over-current protection. The **Red** (+) wire is connected to +12 volt buss. The **Black** (-) wire is connected to the Negative or Ground side of ship's power. After the **Red** (+) and **Black** (-) wires are connected to ship's power, plug the cable assembly into the power/external speaker cable connector of the radio.

NOTE

Use at least 12-gauge wire to carry the transmit 5.5-Amp current. This wire size is appropriate for up to 20 feet of cable length.

When powering up the SE2510 if no display appears once the power is turned on, check the power cable hookup polarity if the in-line fuse is blown. Remember to replace the fuse with one of the same 10-Amp rating. Using a fuse with higher rating can result in permanent damage to the radio.

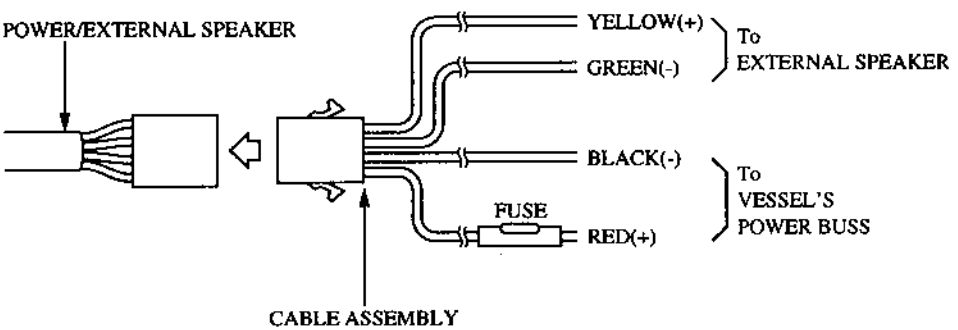


Figure 2-2 Power/external speaker cable and cable assembly

2.5.2 Antenna Connection

Plug the antenna cable PL-259 connector into the connector on the rear panel of the SE2510 Marine VHF radio. ALWAYS, screw down the outer coupling ring of the connector to ensure a solid connection.

2.5.3 Coax Connector Assembly

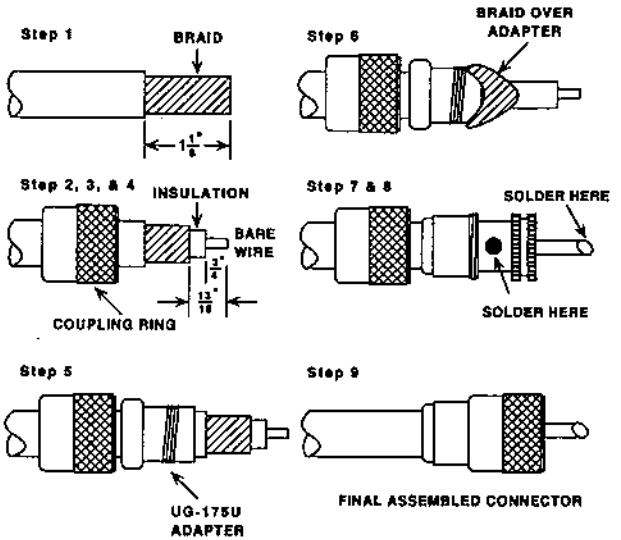


Figure 2-3. Coax Connector Assembly

1. Trim back outer jacket of coax back 1-1/8".

2. Trim back the braided shield, 13/16".

3. Trim back center insulation 3/4".

4. Slip coupling ring over cable.

5. Insert cable through the middle of the UG-175U adapter.

6. Fold the braided shield back over the end of the UG-175U adapter. Be sure there are no shield wires touching the center conductor.

7. Screw the UG-175U adapter into the PL-259 connector while feeding the end of the center conductor of the cable through the hole at the end of the plug.

8. Solder the center conductor of the coax to the center of the PL-259 connector. Trim center conductor. Solder braided shield to the PL-259 connector via the small holes.

9. Screw coupling ring onto the PL-259 connector.

NOTE

If you are not sure about this procedure, have a qualified marine radio service technician assist you.

2.5.4 External Speaker Connection

You can install an external speaker. The external speaker and internal speaker work together. Purchasing and mounting of the speaker is left to the discretion of the owner as there is a great variety of external speakers available, but be sure a 4 or 8 ohm model capable of 3 Watts is purchased. Shakespeare recommends the Models ES-2 or ES-4 for use with the SE2510.

The **Yellow** (+) wire of the cable assembly is connected to the (+) terminal of the external speaker. The **Green** (-) wire of the cable assembly is connected to the (-) terminal of the external speaker (Refer to Figure 2-2).

3.0 OPERATION

The Shakespeare SE2510 Marine VHF radio was designed with the marine environment in mind, with special attention paid to ease of operation. The following section is written to help you realize the maximum benefit of your purchase. The SE2510 Marine VHF radio is not only a convenience but a valuable tool in life threatening situations. This life saving potential makes through study of this Owner's Manual extremely important.

3.1 Controls And Display

All controls and displayed information can be found on the front panel of the SE2510. The backlit LCD display shows selected channel, transmit power setting, and transmit mode. The knob control power ON/OFF, speaker volume adjustment, selection of receive and transmit channels, transmit power level, squelch adjustment, Dual channel watch, weather channel access, USA or International channels and instant channel 16 or 9 priority select, Scan (All Scan & Memory Scan), and Weather Alert. A single beep of the radio indicates a valid keyboard entry. Three beeps mean an invalid entry-PLEASE TRY AGAIN.

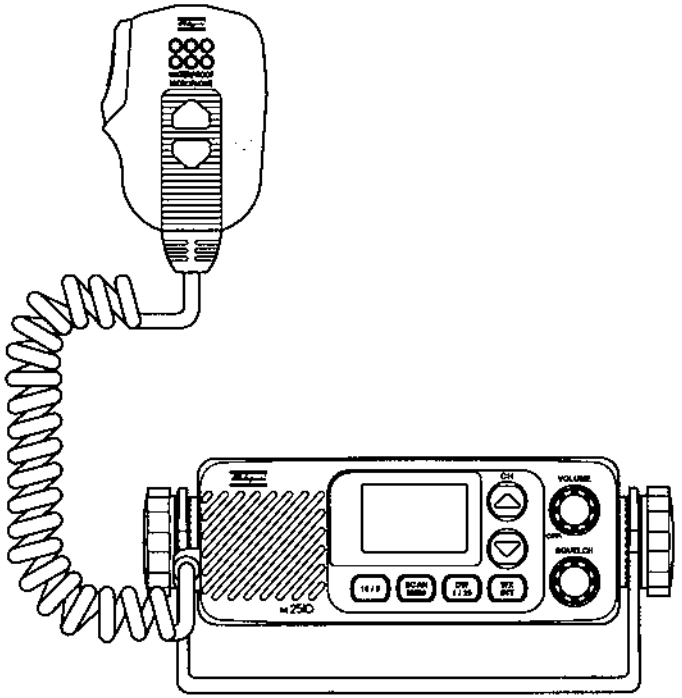


Figure 3-1 SE2510 Marine VHF Radio

3.2 Operating Procedures

3.2.1 Power and Volume Control

To apply power to the SE2510 VHF radio, turn the Volume Control knob (front left control knob), clockwise. A "click" is heard and felt. At this point the display shows numbers and annunciators.

The next thing to do is adjust the Squelch. To do this, turn the Squelch Control knob counterclockwise until static is heard in the speaker. Now, the volume of the speaker can be adjusted to a reasonable level by the Volume Control. Make this adjustment by turning the volume control back and forth until you are comfortable with the background Noise level.

3.2.2 Display Backlighting

The backlighting of the display comes on when the SE2510 is powered up and stays on for the entire time that the radio is on. There is no brightness adjustment.

3.2.3 Setting Squelch

To adjust the squelch setting, start by turning the Squelch Control knob (front right control knob), all the way counterclockwise. Rotate the Volume Control knob until the static noise heard in the radio speaker is at a comfortable level. Next, when no radio transmissions are being heard, turn the Squelch Control knob clockwise just to the point that the static noise is no longer heard. This quiets the static between received radio transmissions and still allows the incoming messages to be heard.

The level of squelch adjustment needed to quiet the radio static noise is dependent on the background static intensity. Keep in mind that the squelch many need to be adjusted when listening to a different channel.

3.2.4 Channel Selection

Channel selection for the normal transmit/receive channels is handled by two separate sets of controls. One set of channel selection arrow keys is found on the front panel directly to the RIGHT of the LCD readout. The other set is found on the front of the microphone. The current channel selection is viewed in the LCD display area.

To change channels using either set of arrows, simply press channel ▲ or ▼ arrow key. Observe the changing channels in the LCD display area. If the channel displayed is a memory channel that is stored in the radio's memory bank, the "MEM" annunciator will also be displayed. From your present channel pressing ▲ arrow key will increase the channel

numbers. In the same respect, from your present channel pressing the ▼ arrow key decreases the channel numbers. If the highest or lowest channel available is reached and the pressing of the arrow key is continued, the channel numbers will cycle around to the top or bottom of the list and continue changing. Holding the ▲ or ▼ changes the channel at a rapid rate. Practice several times to become accustomed to this. Some channels have no TX function (Channel 15). Please study the channel allocation list in the Appendix to become familiar with the proper and customary usage.

3.2.5 USA/International Channel Bank Select

The SE2510 is programmed to access both United States and International channels. Which set of channels you use is determined by the area of operation. Normally in U.S. coastal areas and ports, the USA channels are selected.

To toggle between USA and International channels, press and hold the **WX/INT** key for 2 sec. or more. The channel bank selected is indicated in the display.

3.2.6 Voice Transmitting

Until you have memorized the proper usage of each channel, refer to the Assignment Appendices before attempting to make a voice transmission. There you will find a listing of the channels and their usage.

Once the proper channel has been selected, locate the **Push-To-Talk** key on the side of the microphone. The **Push-To-Talk** key will be referred to from here on as the **PTT** key. To transmit, press and hold **PTT** for the entire transmission. While PTT is held down, speak into the microphone slowly and clearly. When the transmission is complete, release the **PTT** key. While the **PTT** key is being held, "TX" appears in the LCD display window.

If the **PTT** key is pressed for more than 5 consecutive minutes, the voice transmission is interrupted. "TX" in the LCD display disappears and the radio beeps until you release the **PTT** key.

3.2.7 High/Low Transmit Power

The SE2510 has two transmit power levels, 1 Watt and 25 Watts. The low power level (1 Watt) is provided for situations where the two parties involved are close to each other. This reduces the congestion on the same channel in areas far away, allowing more individuals to use a channel at one given time. To toggle the power output selection between "LO" and "HI" press and hold **DW/1/25** key for 2 sec. or more. The transmit power output level is displayed in the LCD display window.

3.2.8 Transmitter 5-Minute Time Out

In the event that the **PTT** key is held in for too long, the transmitter timer will disengage the transmit function after 5 minutes. The **PTT** must be lifted and pressed again to continue transmission. This is designed to prevent a channel from accidentally being tied up by a malfunctioning microphone or transmitter.

3.2.9 Weather Channels Access

The SE2510 has the ability to monitor National and International weather service broadcast. This safety feature allows you to listen to weather reports at any time so changes can be made in your boating plans. This allows you to alert your planned course and to make shipboard preparations.

To change from standard marine VHF channels to the weather channel broadcast, press and release **WX/INT** key. "WX" appears in the LCD display indicating weather channel reception. The initial weather channel displayed, is the last one used. Use the channel change arrow keys on the microphone or the front panel to select another weather channel.

To exit the weather channel, press and release **WX/INT** .

3.2.10 Channel 16/9 Priority

As a convenience and safety feature, the SE2510 VHF radio has a channel **16/9** priority key. Pressing this key from any mode or channel immediately changes the selected channel to channel 16 or 9 with the power output changed to "HI".

Press and hold the **16/9** for 2 sec. or more to toggle the priority channel. Channel 16 or 9 is now memorized and displayed each time the **16/9** key is pressed and released.
Pressing **16/9** key again goes to the last selected working channel.

3.2.11 Channel 13/67 High Power Override

Due to the special usage, FCC assigned channels 13 and 67 are restricted to 1 Watt under normal conditions. In some situations it is acceptable to override this output level and transmit on channels 13 and 67 at 25 Watts. To do this, press and hold the **DW/1/25** key on the front panel of the radio at the same time as **PTT** is pressed for the duration of the transmission.

The LCD display shows "HI" in the display window while the **DW/1/25** key is held down. Upon releasing the **DW/1/25** key, transmit output power drops back to 1 Watt. When another marine VHF channel is selected, the **DW/1/25** key toggles the transmit power setting between 1 and 25 Watts, and does not have to be held in for "HI" power.

3.2.12 Dual Watch Scanning

The Dual Watch feature allows you to monitor the priority channel 16 or 9, a normal working channel, and the weather channel. Once the squelch is properly set, select a working channel using the channel select arrow keys on the front panel or front of microphone. Next, press and release the **DW/1/25** key. "DW" is annunciated in the LCD display and the scanning operation starts. The channel display then changes between channel 16 or 9 and the working channel until a squelch break occurs. The channel displayed at the time of the squelch break is held in the display for 4 seconds after the end of the squelch break. In case of receiving a weather alert signal or the weather channel, the alert tone beeps for 5 seconds and "ALM" blinks on the LCD. To cancel WX alert press any other key.

Pushing the **PTT** key disables the Dual Watch mode at any time. Also, pressing the channel arrow keys, the channel **16/9** priority key, the **WX/INT** key or the **DW/1/25** key turns the Dual Watch mode OFF. Any other key press produces 3 beeps and results in no change in current configuration.

3.2.13 Master Reset

If you hold down the **16/9** key when turning the power on, all channels will be cleared from memory showing "CL" on the display, and the weather channel will be automatically programmed to channel 1. The LCD display shows CH16 USA.

3.2.14 All Channel Scan

When a channel is selected without the "MEM" annunciator showing and the **SCAN/MEN** key is pressed, the radio will start scanning all channels, "SCAN" is annunciated in the LCD display. If a signal is received, the scanning will stop (will hold on displayed channel) until signal is no longer received. Then, after 4 seconds it will continue to scan. To cancel the scanning, press any key except **DW/1/25** key or **WX/INT** key.

3.2.15 Memory Scan

When the memorized channel is selected with the "MEM" annunciator showing and the **SCAN/MEN** key is pressed, the radio will start scanning the memorized channels. "MEM" and "SCAN" are annunciated in the LCD display. If a signal is received, the scanning will stop (will hold on displayed channel) until signal is no longer present. Then, after 4 seconds it will continue to scan. To cancel the scanning, press any key except **DW/1/25** key or **WX/INT** key. To put a channel into memory, select an unmemorized channel and press and hold the **SCAN/MEN** key for 2 sec. or more. "MEM" is now annunciated in the LCD display.

To clear a memorized channel, select the channel to be cleared on the display, then press and hold the **SCAN/MEN** key more than 2 seconds. "MEM" disappears from the display.

3.2.16 External Speaker

When the external speaker is connected to the SE2510 the speaker on the front panel is not disabled automatically. The volume is adjusted in the same way as it is for the front panel speaker using the volume control knob.

3.3 Methods of Operation

The marine VHF radio channels are becoming ever increasingly crowded. This makes it very important and every users responsibility to help relieve channel congestion through use of professional radio techniques. Following the suggested rules will help everyone using marine VHF.

1. Before transmitting, listen to the channel for traffic already in progress. This will stop you from interfering with others using the channel ahead of you. Keep your transmissions as brief as possible but still make your message understood.

2. Give distress calls PRIORITY unless you are in a position to help. Do not transmit but continue to listen.

3. If there is no response to your call, wait 2 minutes before trying again.

4. Calls on channel 16 should be less than 30 seconds in length. Once contact is established, switch to another channel that is more appropriate for your type of communication. Refer to the Appendices on channel assignment for the correct channels to use. Use professional terminology by referring to the Glossary and the phonetic alphabet found in Appendix E.

WARNING

If continuous HI POWER radio transmission exceeds 4-5 minutes, do not touch the rear Die-Cast Heatsink. It will be hot to touch. This is expected normal operation. Please note that the FCC regulations require a 5 minute transmitter time-out. Release the radio's Push to Talk key to reset the timer.

4.0 APPENDIX

APPENDIX A - USA VHF MARINE CHANNEL ASSIGNMENTS

CHANNEL		TRANSMIT	MODE	RECEIVE
01A	Port Operations	156.050	S	156.050
02A	Port Operations	156.100	S	156.100
03A	Port Operations	156.150	S	156.150
04A	Port Operations	156.200	S	156.200
05A	Port Operations	156.250	S	156.250
06	Intership Safety	156.300	S	156.300
07A	Commercial, Intership	156.350	S	156.350
08	Commercial, Intership	156.400	S	156.400
09	Com'l/Non-Commercial	156.450	S	156.450
10	Commercial, Intership	156.500	S	156.500
11	Commercial, Intership	156.550	S	156.550
12	Port Operations	156.600	S	156.600
13**	Bridge To Bridge, 1 W	156.650	S	156.650
14	Port Operations	156.700	S	156.700
15	Environmental (Rec. only)	.....	S	156.750
16	Distress, Safety & Calling	156.800	S	156.800
17*	Maritime Control 1 W	156.850	S	156.850
18A	Commercial, Intership	156.900	S	156.900
19A	Commercial, Intership	156.950	S	156.950
20A	Port Operations	157.000	D	161.600
21A	U.S. Govermental Only	157.050	S	157.050
22A	Liaison USCG Only	157.100	S	157.100
23A	Port Operations, Gov't only	157.150	S	157.150
24	Public Correspondence	157.200	D	161.800
25	Public Correspondence	157.250	D	161.850
26	Public Correspondence	157.300	D	161.900
27	Public Correspondence	157.350	D	161.950
28	Public Correspondence	157.400	D	162.000
60	Public Correspondence	156.025	S	156.025
61A	Public Correspondence	156.075	S	156.075
62A	Public Correspondence	156.125	S	156.125
63A	Com'l, Port Operations	156.175	S	156.175
64A	Public Correspondence	156.225	D	160.825
65A	Port Operations	156.275	S	156.275
66A	Port Operations	156.325	S	156.325
67**	Bridge To Bridge, 1 W	156.375	S	156.375
68	Non-Commercial	156.425	S	156.425
69	Non-Commercial	156.475	S	156.475
70	Digital Selective Calling	156.525	S	156.525
71	Non-Commercial	156.575	S	156.575
72	Non-Commercial	156.625	S	156.625
73	Port Operations	156.675	S	156.675
74	Port Operations	156.725	S	156.725
77	Intership, Port Operations	156.875	S	156.875
78A	Non-Commercial	156.925	S	156.925
79A	Commercial, Intership	156.975	S	156.975
80A	Commercial, Intership	157.025	S	157.025

CHANNEL		TRANSMIT	MODE	RECEIVE
81A	U.S. Government Only	157.075	S	157.075
82A	U.S. Government Only	157.125	S	157.125
83A	U.S. Government Only	157.175	S	157.175
84	Public Correspondence	157.225	D	161.825
85	Public Correspondence	157.275	D	161.875
86	Public Correspondence	157.325	D	161.925
87	Public Correspondence	157.375	D	161.975
88A	Commercial, Intership	157.425	S	157.425

* = 1 Watt
** = 1 Watt initially, HI/LO must be held for 25 Watts.

APPENDIX B - VHF MARINE WEATHER CHANNEL ASSIGNMENTS

CHANNEL		RECEIVE
WX0	Weathers (Receive only)	163.275
WX1	Weathers (Receive only)-NOAA	162.550
WX2	Weathers (Receive only)-NOAA	162.400
WX3	Weathers (Receive only)-NOAA	162.475
WX4	Weathers (Receive only)-CANADA	162.425
WX5	Weathers (Receive only)	162.450
WX6	Weathers (Receive only)	162.500
WX7	Weathers (Receive only)-CANADA	162.525
WX8	Weathers (Receive only)-ENVIRONMENTAL	161.650
WX9	Weathers (Receive only)	161.775

APPENDIX C - INTERNATIONAL VHF MARINE CHANNEL ASSIGNMENTS

CHANNEL		TRANSMIT	MODE	RECEIVE
01	Public Corresp. Port Ops	156.050	D	160.650
02	Public Corresp. Port Ops	156.100	D	160.700
03	Public Corresp. Port Ops	156.150	D	160.750
04	Public Corresp. Port Ops	156.200	D	160.800
05	Public Corresp. Port Ops	156.250	D	160.850
06	Intership Safety	156.300	S	156.300
07	Public Corresp. Port Ops	156.350	D	160.950
08	Commercial, Intership	156.400	S	156.400
09	Com'l/Non-Com'l	156.450	S	156.450
10	Commercial, Intership	156.500	S	156.500
11	Commercial, Intership	156.550	S	156.550
12	Port Operations	156.600	S	156.600
13**	Bridge To Bridge, 1 W	156.650	S	156.650
14	Port Operations	156.700	S	156.700
15	Onboard Communications, (1 W)	156.750	S	156.750
16	Distress, Safety & Calling	156.800	S	156.800
17*	Maritime Control 1 W	156.850	S	156.850
18	Port Operations	156.900	D	161.500
19	Commercial, Intership	156.950	D	161.550
20	Public Correspondence	157.000	D	161.600
21	Public Correspondence	157.050	D	161.650
22	Public Correspondence	157.100	D	161.700

CHANNEL		TRANSMIT	MODE	RECEIVE
23	Public Correspondence	157.150	D	161.750
24	Public Correspondence	157.200	D	161.800
25	Public Correspondence	157.250	D	161.850
26	Public Correspondence	157.300	D	161.900
27	Public Correspondence	157.350	D	161.950
28	Public Correspondence	157.400	D	162.000
60	Public Corresp., Port Ops	156.025	D	160.625
61	Public Corresp., Port Ops	156.075	D	160.675
62	Public Corresp., Port Ops	156.125	D	160.725
63	Public Corresp., Port Ops	156.175	D	160.775
64	Public Corresp., Port Ops	156.225	D	160.825
65	Public Corresp., Port Ops	156.275	D	160.875
66	Public Corresp., Port Ops	156.325	D	160.925
67**	Bridge To Bridge, 1 W	156.375	S	156.375
68	Non-Commercial	156.425	S	156.425
69	Non-Commercial	156.475	S	156.475
70	Digital Selective Calling	156.525	S	156.525
71	Port Operations	156.575	S	156.575
72	Non-Commercial	156.625	S	156.625
73	Port Operations	156.675	S	156.675
74	Port Operations	156.725	S	156.725
77	Intership, Port Operations	156.875	S	156.875
78	Public Corresp., Port Ops	156.925	D	161.525
79	Public Corresp., Port Ops	156.975	D	161.575
80	Public Corresp., Port Ops	157.025	D	161.625
81	Public Corresp., Port Ops	157.075	D	161.675
82	Public Corresp., Port Ops	157.125	D	161.725
83	Public Corresp., Port Ops	157.175	D	161.775
84	Public Correspondence	157.225	D	161.825
85	Public Correspondence	157.275	D	161.875
86	Public Correspondence	157.325	D	161.925
87	Public Correspondence	157.375	D	161.975
88	Public Corresp., Port Ops	157.425	D	162.025

* = 1 Watt
** = 1 Watt initially, HI/LO must be held for 25 Watts.

APPENDIX D - CANADIAN VHF MARINE CHANNEL ASSIGNMENTS (INFORMATION ONLY)

CHANNEL		TRANSMIT	MODE	RECEIVE
01+	Public Correspondence	156.050	D	160.650
02+	Public Correspondence	156.100	D	160.700
03+	Public Correspondence	156.150	D	160.750
04	Intership	156.200	S	156.200
05	Public Correspondence	156.250	S	156.250
06	Intership, Safety	156.300	S	156.300
07+*	Commercial, Intership	156.350	S	156.350
08+*	Commercial, Intership	156.400	S	156.400
09*	Commercial, Intership	156.450	S	156.450
10	Commercial, Intership	156.500	S	156.500
11+*	Commercial, Intership	156.550	S	156.550

CHANNEL		TRANSMIT	MODE	RECEIVE
12+*	Port Operations	156.600	S	156.600
13	Bridge To Bridge, 1 W	156.650	S	156.650
14+**	Port Operations	156.700	S	156.700
15	Onboard Communications, (Rec. only)	.....	S	156.750
16	Distress, Safety & Calling	156.800	S	156.800
17	Maritime Control	156.850	S	156.850
18+*	Commercial, Intership	156.900	S	156.900
19	Commercial, Intership	156.950	S	156.950
20	Port Operations	157.000	D	161.600
21	Coast Guard	157.050	S	157.050
22+*	Coast Guard	157.100	S	157.100
23+	Public Correspondence	157.150	D	161.750
24+*	Public Correspondence	157.200	D	161.800
25+	Public Correspondence	157.250	D	161.850
26	Public Correspondence	157.300	D	161.900
27+*	Public Correspondence	157.350	D	161.950
28+	Public Correspondence	157.400	D	162.000
60+	Public Correspondence	156.025	D	160.625
61^	Coast Guard	156.075	S	156.075
62^	Coast Guard	156.125	S	156.125
63	Ship-to-Ship	156.175	S	156.175
64^+	Public Correspondence	156.225	S	156.225
65**	Port Operations	156.275	S	156.275
66**	Port Operations	156.325	S	156.325
67+*	Commercial, Intership	156.375	S	156.375
68+*	Non-Commercial	156.425	S	156.425
69+*	Non-Commercial	156.475	S	156.475
70+*	Non-Commercial	156.525	S	156.525
71+*	Non-Commercial	156.575	S	156.575
72+	Non-Commercial	156.625	S	156.625
73+*	Port Operations	156.675	S	156.675
74+*	Port Operations	156.725	S	156.725
77**	Commercial, Intership	156.875	S	156.875
78	Non-Commercial	156.925	S	156.925
79+*	Commercial, Intership	156.975	S	156.975
80+*	Commercial, Intership	157.025	S	157.025
81*	Coast Guard	157.075	S	157.075
82*	Coast Guard	157.125	S	157.125
83+*	Coast Guard, Auxiliary	157.175	S	157.175
84+	Public Correspondence	157.225	D	161.825
85+	Public Correspondence	157.275	D	161.875
86+	Public Correspondence	157.325	D	161.925
87+	Public Correspondence	157.375	D	161.975
88+*	Commercial, Intership	157.425	D	162.025

^ = Atlantic Coast only
+ = Pacific Coast only
* = St. Lawrence River area only
** = St. Lawrence River area 1 WATT MAXIMUM

APPENDIX E - PHONETIC ALPHABET AND GLOSSARY

The following list consist of the standard phonetic alphabet, normally used to clarify the transmission of a series of letters.

A - Alpha	J - Juliette	S - Sierra
B - Bravo	K - Kilo	T - Tango
C - Charlie	L - Lima	U - Uniform
D - Delta	M - Mike	V - Victor
E - Echo	N - November	W - Whiskey
F - Foxtrot	O - Oscar	X - X Ray
G - Golf	P - Pappa	Y - Yankee
H - Hotel	Q - Quebec	Z - Zulu
I - India	R - Romeo	

AFFIRMATIVE, used as an answer indicating "yes".

ANTENNA, any part of a radio transmitter that radiates radio energy.

BREAK, used to separate the text from other parts of a message or to separate one message from another.

CHANNEL, a particular frequency or pair of frequencies.

COAX, an electrical conductor used to carry radio energy from the transmitter to the antenna. Normally, the coax has an inner conductor insulated from the outer braided wire shield.

I SPELL, indicates the operator is going to spell the following word, usually using the phonetic alphabet.

MAYDAY, the English of the French M'aidez, "Help Me!"

NEGATIVE, used to indicate an answer of "no". Simply answering yes or no is easily misunderstood when a transmission is weak or noisy.

OUT, signals that the transmission has ended and no reply is expected.

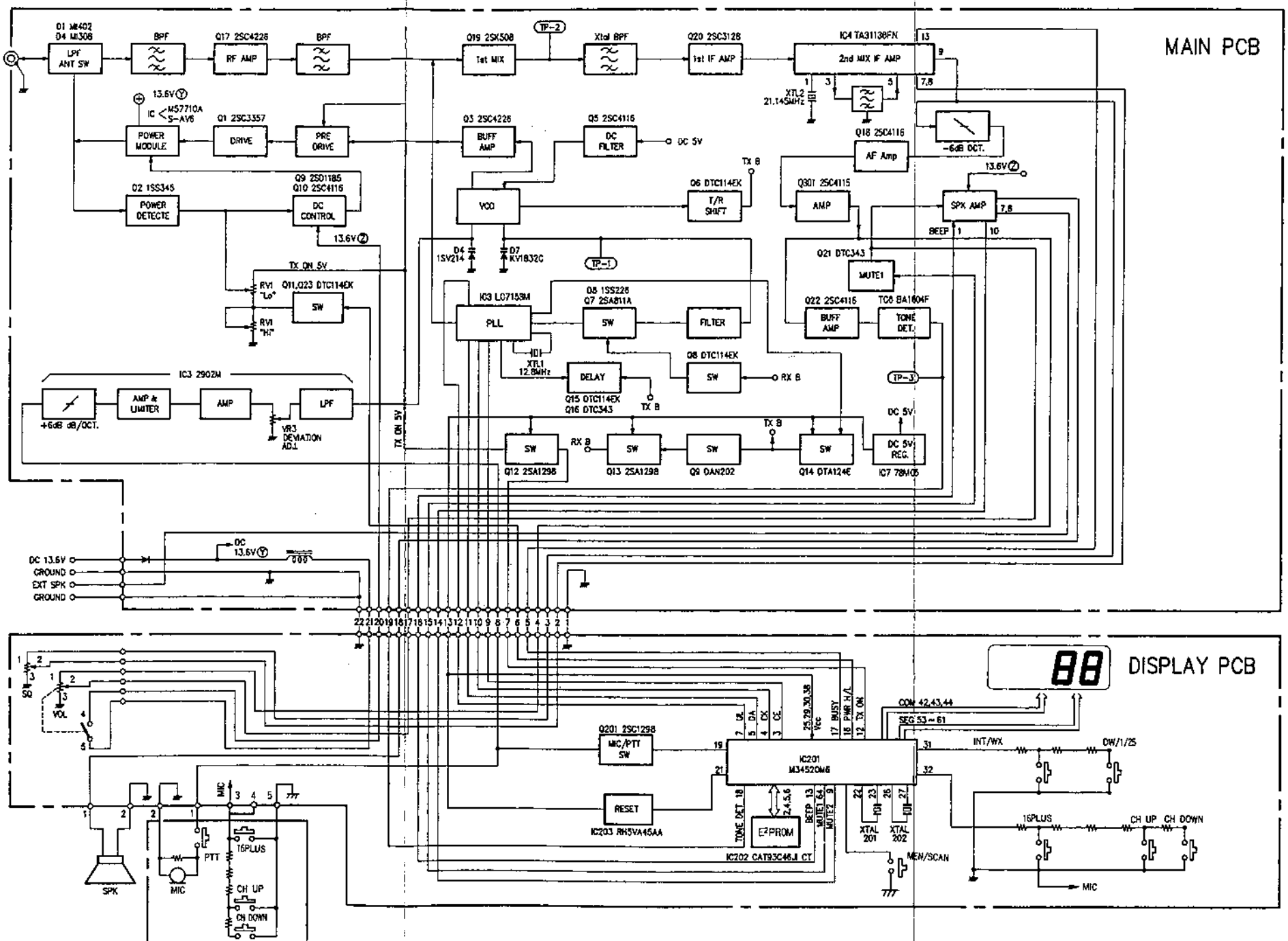
OVER, ends a message and indicates a replay is expected.

ROGER, signals that the message was received satisfactorily.

STANDBY, simply means to wait.

WILCO, this message is a reply that indicates the previous message was received, understood and will be carried out.

APPENDIX F-BLOCK DIAGRAM/PC BOARDS



SHAKESPEARE LIMITED WARRANTY

Shakespeare Company, Inc. (Shakespare) warrants your SE2510 radiotelephone or related accessory for three years form the date of original purchase against manufacturing defects in material and workmanship in accordance with the following terms and conditions. This warranty applies to the original purchaser only and is not transferrable.

During the warranty period, Shakespeare will repair or replace without charge valid defects in material and workmanship. Warranty does not apply to products that have been damaged through accident, misuse, negligence, modification, alteration, abuse, or normal expected wear. Damage that is determined to be of this nature will be repaired at the customer's expense.

Products which have had the serial number modified, defaced or removed will not be eligible for repair under this limited warranty.

Shakespare will not be liable for damages consequential or otherwise arising from the use or inability to use this product. Shakespear's liability is limited to the repair of replacement of the equipment during the warranty period.

Repairs or adjustments covered under this warranty are to be determined by Shakespeare.

Shakespeare requires proof of original purchase date for warranty determination. A copy of the sales invoice or canceled check is satisfactory evidence. This procedure ensures that the time the unit remains in dealer stock is not deducted, and that you receive full-term warranty from the date of original purchase.

After the first 30 days following the original date of purchase, all shipping charges to return units for repair are the responsibility of the customer. Please pack the unit carefully to eliminate shipping damage. It is wise to insure shipments against loss or damage. Return the unit to Shakespeare Company, Electronics and Fiberglass Division, 19845 US HWY. 76 Newberry, SC 29108, Attention: Warranty Repair Department. Please include a detailed description of the problem you are experiencing, along with proof of purchase. Shakespeare will return the repaired unit to you prepaid. Inquiries concerning the status of a warranty claim may be sent to the above address, or expedited by telephoning 803-276-5504 and asking for the Warranty Service Department.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Prior to returning a unit, Shakespeare encourages you to contact the Shakespeare Consumer Service Department by telephone or letter to discuss the nature of the problem. Many times a satisfactory solution can be reached without the need of returning the item.

The Consumer Service Department is also available for out of warranty service and to assist you with any questions or problems associated with the Shakespeare product you purchased.

WARRANTY AND POLICY ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

Ship Units for Repair TO:
SHAKESPEARE COMPANY
ELECTRONICS AND FIBERGLASS DIVISION
Attn: Warranty Service Department
19845 US HWY. 76
Newberry, SC 29108

Shakespeare
ELECTRONICS AND FIBERGLASS DIVISION

Mailing address: P.O. Box 733 Newberry, SC 29108

MARINE VHF TRANSCEIVER EMERGENCY OPERATION PROCEDURE

1. Select Channel 16/9.
2. Press microphone button (Push to Talk).
3. Say, "MAYDAY MAYDAY MAYDAY, THIS IS (vessel name), (vessel name), (vessel name), (call letters), MAYDAY."
4. Tell where you are. Be as specific as possible.
5. State the nature of your distress.
6. Give number of adults and children on board and describe any injuries.
7. Estimate the seaworthiness of your vessel.
8. Briefly describe your vessel.
9. Say, "I WILL BE LISTENING ON CHANNEL 16/9"
10. End with, "THIS IS (vessel name and call letters), OVER"
11. Release the microphone button and listen for a reply. You must wait at least 30 seconds between broadcasts, and each broadcast is limited to 30 seconds. The delay between broad casts is so you can hear any replies. If there is no answer, switch to another channel and repeat the call.

Shakespeare®

ELECTRONICS AND FIBERGLASS DIVISION

an Anthony Industries company

Mailing Address: P.O. Box 733 Newberry, SC 29108
Shipping Address: 19845 US HWY. 76, Newberry, SC 29108
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