SmartCom Portable Transceiver

SCV32 and SCU32

INSTRUCTION MANUAL

WARNING!!

Do NOT Plug WCSC Charger into the Program Jack on top of the Radio

Plugging the WCSC Charger into the programming jack of the radio will result in damage that will not be covered under warranty. The WCSC charger must be plugged into the charge jack located on the side of the battery, BPSC7 or BPSC1

PACKING LIST

1 - Transceiver Unit with Belt Clip

1 - Flexible, Helical-wound Antenna
1 - 10.8V Rechargeable Ni-Cd Battery
1 - WCSC Battery Charger
1 - Instruction Manual

IMPORTANT
Please read all instructions thoroughly before operating the Unit.

INTRODUCTION

NOTE: In this manual, the words Transceiver, Radio and Unit are used interchangeably.

SCV32 and SCU 32 are 32-channel, state-of-the-art, synthesized portable FM Transceivers. The SCV32 operates in the 138-174 MHz VHF band. SCU32 operates in the 403-430 MHz and 450-480 MHz UHF band. Each Unit has a non-volatile memory that requires no battery to maintain its Dealer-programmed information.

Two RF power outputs are available - Low: 1 Watt; High : 5 Watts for SCV32; 4 Watts for SC U32.

Each Unit features a Priority function which periodically samples a User-selectable channel for activity. It also features a built-in DTMF Keypad.

A Liquid Crystal Display (LCD) provides useful information such as Channel Number and Status, Priority Channel and Status, Output Power Level Status, etc. See page 5 for details.

The Radio can be programmed by a Factory-authorized Service Dealer to provide any number of channels from 1 to 32, CTCSS tone frequencies, DCS Codes, DTMF and Selective Calling operation, Radio Common Carrier (RCC) operation and other features to meet various User requirements. See pages 22 and 23 for details.

Optional Accessories:

-RSC-2l Drop-in Quick Charger
-BPSCI 10.8V (1000 mAH) Rechargeable Battery

-LCSC Leather Carrying Case
-SMSC External Speaker/Microphone

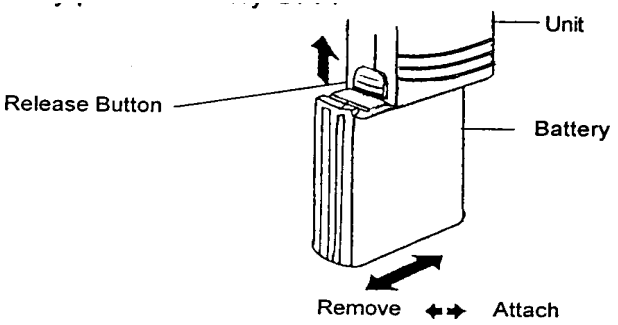
INSTALLATION

BATTERY INSTALLATION AND REMOVAL

A. To attach the battery, align the grooves on the battery case with those on the Unit and slide it into place until a "snap" is heard.

> **NOTE:** If the Unit is turned on and the display starts "flashing",the battery is *low* and needs to be charged. See pages 4 and 19 for details.

B. To remove the battery, press UP on the Release Button and slowly pull the battery OFF.



ANTENNA INSTALLATION AND REMOVAL

See Side View on page 5 for details. The SCV32 uses a RDSCV antenna, the SCU32A'uses a RDSCUA antenna and the SCU32B uses a RDSCUB antenna.

A. To install the antenna, carefully place it on the TNC type antenna connector located on the LEFT side of the Unit. Turn the antenna *clockwise* until it is firmly attached.
B. To remove the antenna, turn the antenna *counter-clockwise until* it can be lifted away from the Unit.

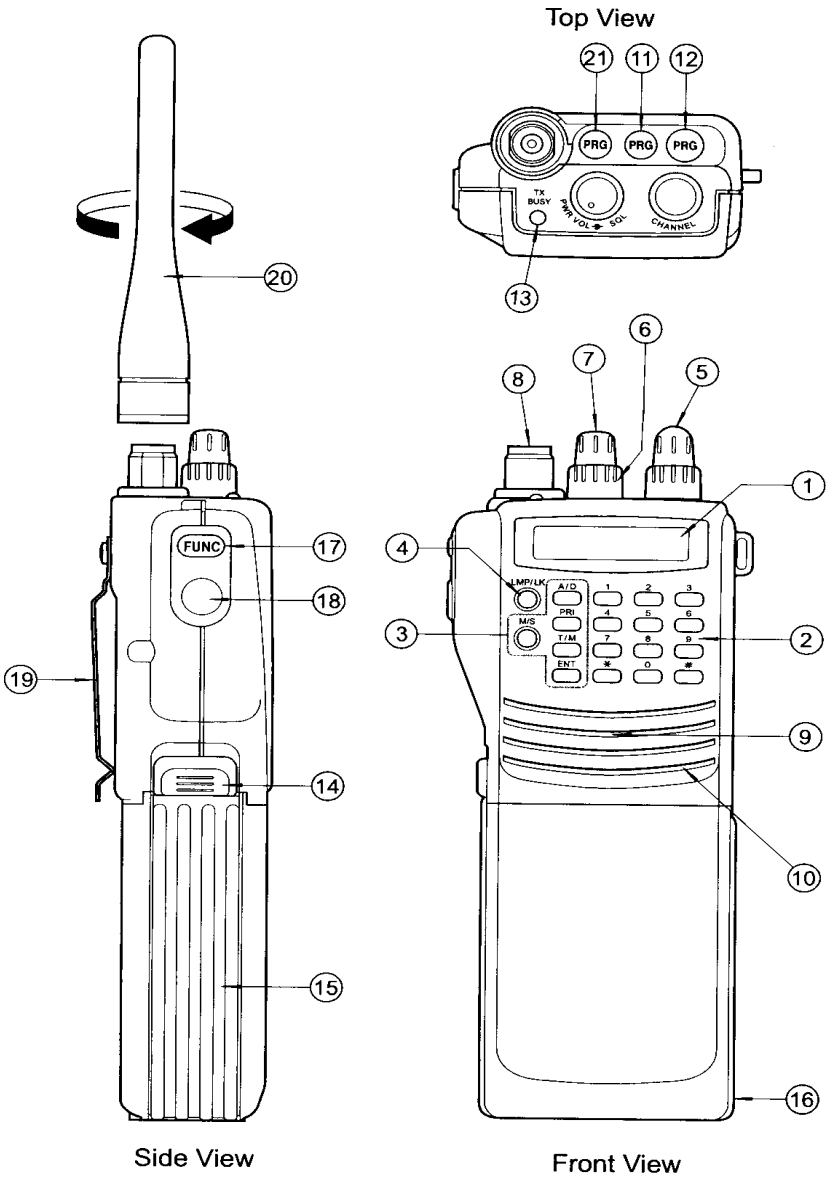
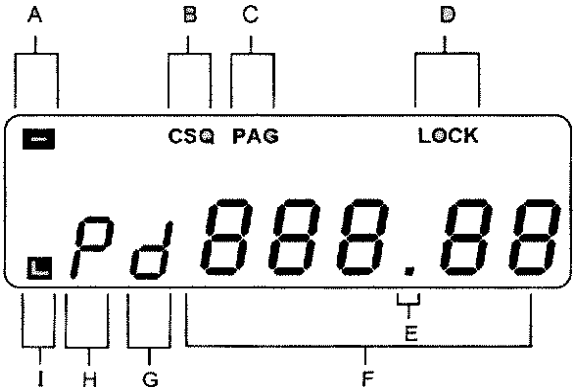


Figure1. Transceiver views.

1. The LCD Display



A. Blinking when battery voltage is low.
B. Displayed when TONE Mode or Busy Channel Lockout is enabled.
C. Displayed when the SELECTIVE CALLING (DTMF) Mode is enabled and the Channel is programmed for DTMF decode. Displayed continuously when Unit is programmed for RCC operation.
D. Displayed when the Keypad and Channel Selector (see page 18) are locked (disabled).
E. Blinking when Unit is in SCAN Mode and has stopped on a channel.
F. Indicates the channel number and when the Unit is scanning (SCAN displayed). It also displays the Telephone Number keyed in when Unit is programmed for RCC operation.
G. Displayed when the channel being shown is deleted from the Scan List.
H. Displayed when the Priority Function is enabled.
Blinking when the channel being shown is the Priority Channel.
I. Displayed when the transmitters output power is *Low.*

2. Keypad

The Keypad is used to select channels, DTMF tones and special User-selectable functions or features.

3. Operation Keys

These five keys (or buttons) permit the User to control or to select the basic operation of the Unit.
1-The **M/S** Key provides for selecting either MANUAL or SCAN Mode.

2-The **A/D** Key is used to Add or Delete a channel from the Users Scan List. It also is an "A" for DTMF encoding purposes.

3-The **PRI** Key is used to enable/disable the Priority Function and to select the Priority Channel. It also is a "B" for DTMF encoding purposes.

4-The **T/M** Key provides for enabling/disabling the CTCSS/DCS or Selective Calling (DTMF) TONE Mode. When neither TONE Mode is enabled, the Unit is in the MONITOR Mode. It also is a "C" for DTMF encoding purposes.

5-The **ENT** Key is used when programming the Unit. It is also a "D" for DTMF encoding purposes.

4. LAMP/LK Key

Pressing this key turns the LCD illumination ON for approximately 2 seconds. See page 9 for more details on usage of this key.

5. CHANNEL (Channel Selector)

This control is used to change the channel number. Turning this control also takes the Unit out of the SCAN Mode.

6. SQL (Squelch Control)

This control is used to eliminate speaker noise and reduce battery drain while not receiving a transmission. The Unit must be squelched (turn control *clock-wise)* for proper SCAN operation.

7. PWR VOL (Power Switch/Volume Control)

Turning this control in the *clockwise* direction turns the Unit ON. Turning it further in the *clockwise* direction increases the volume.

8.Antenna Connector

The supplied helical antenna (RDSCV, VHF; RDSCU A or RDSCUB, UHF) is installed on this type TNC connector.

9. Speaker

This is the Transceivers built-in speaker.

10. Microphone

This is the Transceivers built-in condenser type microphone.

11. MIC (External Microphone Jack)

This 2.5MM jack is used to connect an external microphone to the Transceiver. Keep the protective plug in place when the jack is not used.

12. SP (External Speaker Jack)

This 3.5MM jack can be used to connect an 8 Ohm external speaker or ear phones. No sound is available from the built-in speaker when a plug is installed in this jack. Keep the protective plug in place when the jack is not used.

> **NOTE:** The optional SMSC External Speaker/Microphone utilizes both jacks (2.5MM and 3.5MM).

13. TX/BUSY (Transmitting/Busy Indicator)

This indicator lights **RED** when transmitting and lights **GREEN** when a signal is being received. It also lights **GREEN** when the Unit is unsquelched. This is a helpful guide in setting the Squelch Control.

14. Release Button

The battery is locked in place by this button.

15. Battery

This is a rechargeable Nickel-Cadmium type battery. Either the BPSC7 or BPSC1 is included with the Unit and is a 10.8V battery.

16. Nickel-Cadmium Battery Recharge Terminal

This terminal is used to recharge theBPSC7 or BPSC1 NickelCadmium battery. The WCSC Battery Charger (also included) will fully charge the BPSC7 in approximately 14 to 16 hours or the BPSC1 in approximately 20 to 22 hours if either the Unit is turned off or the battery is removed from the Unit. Be sure to reinstall the protective plug when the Charger is disconnected.

17. FUNC (Function Button)

Holding down the **FUNC** button while certain keys are pressed enables these

keys' second function, which are:

- **FUNC + LAMP/LK**
  Pressing the **LAMP/LK** Key turns the LCD illumination on until either the Unit is switched OFF or the **LAMP/LK** Key is pressed again while holding down the **FUNC** button.

- **FUNC + M/S**
  Pressing the **M/S** Key selects the Review Mode.

- **FUNC + PRI**
  Pressing the **PRI** Key programs the channel being displayed as the Priority Channel, if the PRIORITY Function is deactivated.

- **FUNC + T/M**
  Pressing the **T/M** Key toggles the SELECTIVE CALLING Tone Mode from enabled to disabled and vice versa.

- **FUNC + 1**
  Pressing the **1** Key toggles the Unit's Power Level from Hi (4 Watts UHF or 5 Watts VHF) to 1 Watt and vice versa.

- **FUNC + 2**
  Pressing the **2** Key toggles the Lock feature for the Keypad from *Unlocked to Locked* and vice versa. The Channel Selector is also affected if its Lock Option is enabled (by the Dealer).

- **FUNC + 3**
  Pressing the **3** Key toggles the Beep status from enabled to disabled and vice versa. ALL *beeps* are affected by this selection.

18. PTT (PTT Button)

This button is used to switch between transmission and reception. To transmit, hold in this button. Releasing this button will return the Transceiver to the reception mode.

19. Belt Clip

When not using the belt clip, install the mounting screws in order to help ensure water resistance.

20. Antenna

The antenna is a TNC connector-type helical wound antenna.

21. PRG (Programming Jack)

This coaxial type jack is used by the Dealer for cloning and programming the Unit.

OPERATION

Each time the Unit changes mode or a key is pressed, a beep is heard. This feature can be disabled by the User (see Beep Feature, page 19), but in this Manual it is assumed to be enabled.

TURNING UNIT ON

1 . Rotate the **PWR VOL** knob *clockwise* to turn power ON. The display will show the last operating mode.

2. Adjust the audio's volume by turning the **PWR VOL** knob *clockwise* to increase the audio output, or *counter-clockwise to* decrease it. If necessary, first turn the Squelch **(SQL)** Control *counter-clockwise* until noise is heard. Then set the Volume Control to the desired level.

3. Turn the Squelch Control **(SQL)** *clockwise* until "noise" is no longer heard (squelched). Battery life is maximized if the Unit is squelched when not receiving a signal. While in the SCAN Mode, the Squelch Control may require being turned slightly more clock*wise* to a setting that permits proper scanning operation.

If the Unit has been programmed for *Busy Channel Lockout* (see page 14 for details), "noise" may not be heard. If this is the case, put the Unit in the SCAN Mode (press the **M/S** Key) and turn the Squelch Control until *SCAN* appears in the display.

If the SELECTIVE CALLING Tone Mode is enabled (see page 14) or if the Unit is programmed for RCC operation (see page 16), "noise" will not be heard. In this case, turn the Squelch Control *clockwise* until the **BUSY** LED (**Green**) is off.

RECEIVER OPERATION

Unless the Unit is programmed for RCC operation, the Receiver operates in one of *two* basic modes: MANUAL or SCAN. In either mode, a particular channel may be User selected for being sampled on a Priority basis. See page 12 for details.

MANUAL Mode

In this mode, the Unit monitors activity on the displayed channel. To put the Unit in the MANUAL Mode, if it is in the SCAN Mode,either:

1. Press the **M/S** Key, or
2. Turn the Channel Selector knob, or
3. Press the desired channel's number (two digits; 01 - 32).

To select a particular channel, either turn the Channel Selector until the desired channel is displayed or key in the channel's two digit number. The display will show, for example:

SCAN Mode

To put the Unit in the SCAN Mode, if it is in the MANUAL Mode, press the **M/S** Key. "*SCAN*" should appear in the display.

> **REMINDER:**The Squelch Control must be set for proper scanning operation. See page 10 for details.

In this mode, only channels in the Scan List will be scanned for activity. The User can select which channels are to be included (added) or excluded (deleted) from the List.

ADDING/DELETING CHANNELS TO THE SCAN LIST

Put the Unit in the MANUAL Mode. Press the desired channel's number (01-32), or turn the Channel Selector knob until the desired channel is in the display. Pressing the **A/D** Key toggles the channel's Scan List status. If a small "d" appears at the left side, the channel is now deleted from the List. If the small "d" disappears, the channel is added to the List. For a deleted channel, the display will show, for example:

REVIEWING SCAN LIST

To review the Scan List, put the Unit in the MANUAL Mode and then *slowly* turn the Channel Selector knob until all channels have been observed. Any channel without the small "d" is included in the Scan List.

> **NOTE:**If the Scan List has no channels, a low tone (error beep) will be heard when the **M/S** Key is pressed. Also, *"SCAN"* will not appear in the display. At least one channel must be in the Scan List for the Unit to be put in the SCAN Mode.

SCAN OPERATION

When in the SCAN Mode, the Unit will scan only those channels in the User-selected Scan List. The display will show the word *"SCAN "*, which indicates that the Unit is actively "scanning" the User selected channels.

When a proper signal is received on a channel, the scanning action will stop and the channel's audio will be heard. After activity ceases on the channel, the Unit will delay (or stay) on that channel for 1/2 to 9 seconds and then resume scanning.

> **NOTE:**The delay, often referred to as Scan Delay, is Dealer programmable. See Option on page 22 for details.

If the **PTT** switch is pressed while the Unit is scanning, the Priority Channel is immediately accessed for the transmission. After the **PTT** switch is released, the Unit will stay on the Priority Channel for at least two seconds to wait for a response. If there is no activity (or signal), the Unit will then resume scanning.

PRIORITY FUNCTION

ACTIVATING OR DEACTIVATING PRIORITY

To activate (or deactivate) Priority, press the **PRI** Key. When the Priority Function is activated, "P" will appear in the display. For example:

PRIORITY CHANNEL SELECTION

First, put the Radio in the MANUAL Mode and deactivate the Priority Function. Second, select the desired channel either by pressing the channel's two-digit number or by turning the Channel Selector knob. Third, press and hold down the **FUNC** button and then press the **PRI** key. "P" will be blinking in the display.

Priority Operation in MANUAL Mode

When a channel other than the Priority Channel is manually selected, the Unit will sample the Priority Channel approximately every two seconds. If any activity is found on the Priority Channel, the Radio will stay on the Priority Channel and Monitor the transmission. After the transmission is completed,the Unit will remain on the Priority Channel for approximately 12 seconds and then return to the non-priority channel.

Priority operation in SCAN Mode

When the Radio has stopped on an active non-priority channel, it will periodically look at the Priority Channel. If the Priority Channel has activity, the Radio will then stay on the Priority Channel. After the activity is completed and the Priority Channel has timed out, the Radio will return to the non-priority channel.

If the Priority Channel is NOT active, the Radio will quickly return to the (non-priority) channel that was interrupted. When activity on the non-priority channel is completed, the Unit will resume scanning after the Scan Delay has timed out.

TONE Mode

CTCSS and DCS Operation

To enable the built-in CTCSS tone/DCS Code decode(see Options on page 21) press **T/M** key. A small "CSQ" will appear in the display, as shown in the following example:

NOTE The Unit can be programmed by the Dealer for CTCSS tones and DCS Codes. Each channel may be programmed for non-tone/code, for the same tone/code, or for a different tone/code. In other words, each chanel can have its own unique tone/code set-up.

If a signal with an improper or non-matching CTCSS tone or DCS Code is received, the BUSY LED will light, but the squelch will not open and no audio will be heard. Press the **T/M** key to disable the TONE Mode andthen the signal's audio can be heard, unless *Busy Channel Lockout* is enabled.

SELECTIVE CALLING OPERATION

SELECTIVE CALLING Tone Mode operation is available only in the MANUAL Mode, on a channel programmed with DTMF tones and Priority is disabled. To enable the built-in DTMF decoder see options on page 22, press the **T/M** key while holding down the **FUNC** button. A small "PAG" will appear in the display, as shown below:

If a signal with proper or matching DTMF tones is received, three beeps will be heard, then the squelch will open and the audio will be heard. The DTMF decoded is automatically reset on every press of the PTT switch and when the unit has not received a signal for approximately 2.5 seconds.

> **NOTE:** The Unit can be parogrammed by the Dealer for DTMF tones. Each channel can have its own uique set of DTMF tones.

For proper two-way communications, while in the SELECTIVE CALLING Tone Mode, the DTMF tones must be sent on every press of the PTT switch in order to open the receiving Unit's squelch on each transmission. See Options on page 22 for more details.

If SELECTIVE CALLING is enabled, Tone or BCL operation is overrided. Thus, if "CSQ" and "PAG" are bothin the display, audio can be heard only if a signal with the proper DTMF tones is received.

The SELECTIVE CALLING Tone Mode is disabled if:

a. A different channel is selected or
b. The Unit is put into the SCAN MODE, or
c. The **PRI** key is pressed, or
d. The **T/M** Key is pressed while the **FUNC** button is held down

BUSY CHANNEL LOCKOUT

Busy Channel Lockout (BCL) is a special TONE Mode feature, when enabled by the Dealer, that prohibits monitoring (listening to) or transmitting on a channel

that is receiving a signal with an *improper* CTCSS tone or DCS Code. No matter where the Squelch Control is set, audio will NOT be heard unless the signal has the proper tone or code. The **BUSY** LED (**green**) will be on, but audio may not be heard. The **T/M** Key will be disabled and thus, the Unit can not be put into the MONITOR Mode.

TRANSMITTER OPERATION

WARNING An Industry Canada license is required on all transmit channels. Do NOT transmit on unlicensed channels

WARNING Do NOT operate this Unit close to electrical blasting caps, or in an explosive atmosphere such as fuel or solvent vapors, dust, etc.

Procedure

1 . Select the desired channel. Monitor the channel for activity before transmitting to avoid interfering with communications already in progress. If the **BUSY** LED is ON and no audio is heard, the signal probably has a different tone than what is programmed for the channel.

2. Press and hold in the Push-to-Talk **(PTT)** switch located on the left side of the Unit. The **Red TX** LED will light and stay on as long as the **PTT** switch is held in.

   a. If BCL is enabled and the channel is receiving an incorrect tone, a series of *beeps* will be heard and the Unit will NOT transmit **(TX** LED stays off).

   b. Also, if the channel is Receive Only, a series of *beeps* will be heard and the Unit will NOT transmit(**TX** LED stays off).

HIGH/LOW Power Selection

To change the Units Power Output level from *High* (4 or 5 Watts) to *Low* (1 Watt), or vice versa, first put the Unit in the MANUAL Mode Second, press and hold in the **FUNC** button and then press the 1Key. A small L will appear in the display to indicate Low Power.
High Power is indicated by the absence of L.

If the - is "flashing" (Low Baftery indication), the Unit will then automatically revert to Low Power when transmitting in order to help prolong the Battery's operational life.

DTMF Operation

The Dealer can program any Channel for DTMF decoding and encoding. Each channel can have 4 DTMF tones (numbers 0 through 9; # and *; A, B, C and D). For encoding purposes, the Dealer can program the Unit so that the DTMF tones are automatically sent upon either the first or every press of the **PTT** switch. See Option No. 6 on page 22. The "first" press of the **PTT** switch is the initial activation of the transmitter on the channel. Subsequent pressings of the **PTT** switch will NOT send the DTMF unless:

a. The channel's number is entered again by the key pad, or
b. The Channel Selector is turned off the channel and then back to it, or
c. The Unit is turned off and then back on, or
d. A different channel is selected.

Individual DTMF tones can also be sent, while transmitting, by pressing the corresponding button on the Keypad or one of the four Operational Keys. See Figure 2 on page 17.

NOTE: For DTMF encoding purposes: the **A/D** Key is an **A,** the **PRI** Key is a **B,** the **T/M** Key is a **C** and the **ENT** Key is a **D.**

Time Out Timer

A transmit Time Out Timer is built into the Unit. The Timer can be programmed by the Dealer to automatically shut down the transmitter after 15 seconds (or up to 60 seconds) of operation even if the **PTT** switch is held in continuously. The Dealer can also *disable* the Timer. In which case, the length of any transmission is determined by how long the **PTT** switch is held in. See Option No. 9 on page 22.

If the Timer is enabled, a series of *beeps* will be heard and the **TX** LED will go out when the **PTT** switch is held in after the Timer has timed out. To resume transmitting, momentarily release the **PTT** switch and then press again.

RCC OPERATION

General

Radio Common Carrier (RCC) operation provides the User with mobile telephone capabilities. The Unit can originate or receive calls somewhat similar to regular telephone usage. However, conversation is not carried on in a two-way manner, but in a push-to-talk (PTT) and release-to-listen manner.

When programmed (by the Dealer) for RCC operation, the Unit is always in the

MANUAL Mode. Channel selection can be made only by use of the rotary Channel Selector switch. The display will always show "PAG" (small letters) and either the Channel Number or a keyed in Telephone Number. The Dealer will also program in a special identifying code referred to as the Unit's Automatic Number Identification (ANI) Code.

The keypad is used to enter a regular Telephone Number consisting of 7 to I 1 digits (numbers 0 to 9) and for DTMF type operation. The Telephone Number is displayed as it is keyed in. The digits are shown starting at the right end of the display. Only the last 7 digits entered are displayed, but the first 4 (if 11 are entered) are still in memory. The display does not show any DTMF entries.

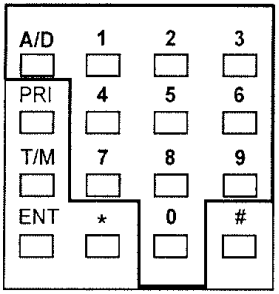


Figure 1.
Telephone Number Keypad.

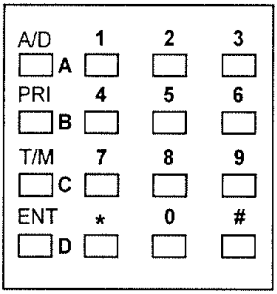


Figure 2.
DTMF Keypad.

When used for entering a Telephone Number, the **PRI, T/M** and **ENT** keys are non-usable. See Figure 1 above. The **A/D** key is used to delete (clear) a digit just pressed or previously entered digits. Each press of the **A/D** key deletes the right end digit and any remaining digits then scroll to the right. If the **A/D** key is pressed and held in for approximately 3 seconds, all of the digits are deleted.

The Telephone Number, when entered, is saved in what is commonly referred to as "scratch pad" memory. The Number will remain in this memory until either a new Number is entered, the **A/D** key is used to delete it, or the Unit is turned OFF. Changing channels does not affect the scratch pad's memory.

When used as a DTMF Keypad, all keys are usable. See Figure 2 above. However, the **A/D, PRI, T/M** and **ENT** keys are then used as **A, B, C** and **D** respectively. All of the other keys are used as indicated. The keypad is enabled for DTMF usage only when the **PTT** button is pressed. In other words, the Unit must be transmitting **(PTT** held in) for the keys to become usable for DTMF purposes.

To Originate A Call

Key in the desired Telephone Number (up to 11 digits). If the channel is not busy, press the * key to automatically transmit the connect (*) tone, the Unit's ANI Code and then, after the RCC Delay time (programmed by Dealer), the Telephone Number.

> **REMINDER:**The Telephone Number does not have to be keyed in each time a call is to be made, unless it is to be changed or the Unit has been turned OFF since the last call.

The Radio is now in the Receive Mode and the **PTT** button can be pressed, which enables the Transmitter and the DTMF keypad. At this time, while holding in the **PTT** button, either press the desired DTMF keys and/or speak into the Radio's microphone. After your end of the conversation is finished, release the PTT button to listen to any reply. To end the contact, press the # key to automatically send the disconnect (#) tone and the ANI code.

If a Telephone Number is not in the scratch pad memory (it has been deleted or the Unit was turned OFF) and the * key is pressed, the Radio will still transmit the connect (*) tone and the ANI code. It will then go to the Receive Mode and wait for a dial tone to be received. After the dial tone is received, press the **PTT** button and key in the desired Telephone Number.

To Receive a Call

With the Radio in the Receive Mode, squelch will open and 3 beeps will be heard only when it receives an ANI code that corresponds (identical) to its own ANI code. At this time, the **PTT** button is enabled and can be pressed to start transmitting your end of the conversation. Release the **PTT** button to listen to any reply.

OTHER USER-SELECTABLE FEATURES

KEYPAD AND CHANNEL SELECTOR LOCK

The Keypad and all other buttons (except **FUNC, LAMP/LK** and **PTT)** and the Channel Selector* can be "LOCKED" or be made inoperative while the Unit is in the Receiver Mode. These buttons can still be used for DTMF encoding while the Unit is in the Transmitter Mode. The Unit can be in either the MANUAL or the SCAN Mode.

> **The Channel Selector can be locked with the keypad only if the Channel Selector Lock option (Dealer Programmable) is enabled.* *See Option 11 on page 22.*

Press and hold in the **FUNC** button and then press the **2** Key. A small "LOCK" will appear in the display to indicate the LOCK function is enabled. Use the same procedure to disable the LOCK function.

> **IMPORTANT:** Keypad Lock feature is disabled if the, Unit is programmed for RCC operations

The Channel Selector can be locked with the keypad only if the Channel Selector Lock Option (Dealer Programmable) is enabled. See Option 11 on page 22.

BEEP

When the Beep feature is enabled, a beep can be heard when any button (except **LAMP/LK** and **PTT)** is pressed or when the Channel Selector is turned to Channel 01. To disable this feature, press and hold in the **FUNC** button and then press the **3** Key. No *beeps* will be heard except for when the **PTT** is pressed and the channel is a Receive Only channel or the channel is receiving an incorrect tone and BCL is enabled. In this case, a series of error beeps will be heard until the **PTT** button is released.

BATTERY INFORMATION

GENERAL INFORMATION

Keep the Battery charged. It may be charged without being installed on the Unit. Either the WCSC Wall-mounted Charger supplied with the Unit or the optional accessory RSC-21 Drop-in Quick Charger may be used.

Do NOT use any other charger, or damage to the Battery may occur.

The WCSC Charger will fully charge the BPSC7 in approximately 14 hours and the BPSC1 in approximately 20 hours. The RSC-21 Drop-in Charger will fully charge either battery in approximately 1 3/4 hours. These times are dependent upon the Unit being turned off or the battery is not installed while being charged.

> **NOTE:**The BPSC7 or BPSC1 battery is not fully charged when shipped from the Factory. It should be properly charged before use.

POWER SAVE FUNCTION

A Power Save Timer is built into the Unit. With the Unit in the MANUAL Mode and not receiving a signal, the Power Save Function conserves battery power, by reducing the current drain for a selected period of time. The Timer

automatically shuts down the receiver for 150 milliseconds and then turns it back on for approximately 110 milliseconds, for a total cycle time of 260 milliseconds. See page 23 for more details.

FOR LONGEST BATTERY LIFE AND BEST PERFORMANCE

I . Charge the Battery to full capacity: 14 to 20 hours with the WCSC; for the RSC-21 Quick Charger allow 1 3/4 hours.

2. Use the Battery as soon and as much of its capacity as possible and practical. A Battery that is charged and discharged completely will maintain the longest operating time capacity. Also, typically 3 to 5 charge-discharge cycles are required to bring a new Battery up to its rated capacity.

3. Store and charge the Battery at a room temperature of 18 to 24 C (65 to 75 F). A Battery that has been stored for over a month should be recharged before being put into service, due to chemical self-discharge which occurs at a rate of approximately 1% per day. Do NOT charge a cold battery that is at 0 C (32 F) or below until it is at least above 7 C (45 F).

4. Reduced capacity of the Battery may result from repeated identical shallow discharge-full charge cycles. If such a condition is suspected, use the Battery until the Transceiver indicates a Low Battery ("flashing" 0), then fully recharge and discharge again. Repeat this cycle 3 to 5 times. Full rated capacity should then be available.

CAUTION: Do NOT short or incinerate the battery

IMPORTANT: Please recycle or properly dispose of any nonusable or defective BPSC7 or BPSC1 battery.

MAINTENANCE

NOTE: All adjustments affecting transmitter power output, carrier frequency or modulation MUST be performed by a qualified electronics technician.

CAUTION Do NOT tamper with internal adjustments. Damage to the equimpent and/or impropert operation may result.

Service Reminder

Have the Transceiver checked periodically by a qualified techincian.

TROUBLESHOOTING

Perform the simple checks indicated below prior to returning the Unit for service.

Trouble	**Check**
No reception.	Check antenna connection.
Does not scan.	Check squelch setting.
No sound.	Volume Control Setting.
No display or "flashing" .	Low Battery; charge or replace. See pages 19 and 20 for details on proper battery maintenance.
Key Pad buttons don't work. Channel Selector doesn't work. Can't transmit on a selected channel.	Is "LOCK" in the display? Disable the LOCK function (p. 18). Is Channel *Receive Only?* Is BCL enabled and **BUSY** LED is ON? If it is, you will hear a series of *beeps* while **PTT** is depressed. Has * been pressed? (RCC only)

SUMMARY OF DEALER'S PROGRAMMING OPTIONS

1. **Number of Channels** - the Unit can be programmed for 1 to 32 channels. Any channel not programmed is deleted and can not be accessed by the User.

   NOTE: The Unit can be modified to have 64 channels. This optional modification is available from you local dealer.

2. **Receive Only Channel** - the transmit frequency can be deleted from any channel, thus making that channel only capable of receiving. This would be very useful for such purposes as monitoring a channel (a National Weather Service Channel for example) that would not require or permit transmitting.

3. **CTCSS Tones** - any one of 50 CTCSS (Continuous Tone Controlled Squelch System) Tones can be programmed for any channel. The Tone used for a channel's decode (receive) frequency can *either* be the same, or different, from that channel's encode (transmit) frequency.

4. **DCS Codes** - any one of 104 DCS (Digital Coded Squelch) Codes can be programmed for any channel. The Code used for a channel's decode

(receive) frequency can either be the same, or different, from that channel's encode (transmit) frequency.

5. **DTMF Tones** - any four DTMF (Dual-Tone Multi-Frequency) Tones, consisting of 0 - 9, * and #, A - D, can be programmed for any channel.

6. **DTMF Operation** - The Unit can be programmed to automatically send the DTMF Tones either after the first press of the **PTT** switch or for every press of the **PTT** switch.

   For proper two-way SELECTIVE CALLING operation, the DTMF tones must be sent on every press of the **PTT** switch in order to open the other or receiving Unit's squelch. This is because a Unit's DTMF decoder is always automatically reset after it transmits while in the SELECTIVE CALLING Tone Mode.

   Also, the Unit's DTMF decoder automatically resets if it has not received a signal for approximately 2.5 seconds. Thus, it needs to receive the DTMF tones again to open squelch.

7. **Busy Channel Lockout** - the Unit can be programmed to prevent listening or transmitting on a channel if that channel is receiving a signal that has a DCS Code, CTCSS Tone or DTMF Tones that do NOT match its own Code, Tone or Tones. Thus, it is a *busy* channel and should not be used at this time.

8. **Scan Delay** - the Unit can be programmed to delay (for 1/2, 1 or up to 9 seconds) the restart of the scanning action after the signal has gone away. This delay gives the User some time to respond to the signal before scanning resumes.

9. **Time-Out-Timer** - the Unit's Time-Out-Timer can either be disabled completely or set to only allow a transmission of 1/4, 1/2 or 1 minute duration. The Timer is normally used to prevent excessively long transmissions that might be deliberate or caused by an inadvertent or accidental pressing of the **PTT** switch.

10. **RCC Operation** - The Unit can be programmed to be used in the Radio Common Carrier (RCC) Services. If programmed as such, it can not be used as a normal or standard 2-way radio. RCC Delay (1/2 to 9 seconds) is also selected when the Unit is programmed for RCC operation. RCC Delay is the time after the ANI is sent before the scratch pad number is automatically sent.

11. **Channel Selector Lock** - the Unit can be programmed so that the Channel

Selector is locked (inoperative) when the Keypad is locked (user selectable).

POWER SAVE TIMER DETAILS

The built-in Power Save Timer automatically shuts down the receiver for a period of time as determined by the Unit's microprocessor. At the end of the Timer's shut down period, 150 milliseconds, the receiver is activated again for approximately 110 milliseconds.

If a signal is present during this time, it stays activated for 3 seconds after the signal is gone and then the Timer shuts it down again for 150 milliseconds. Pressing any button, or turning the Channel Selector, immediately turns on the receiver for at least 3 seconds. Power Saver is disabled if either Tone Mode or Scan Mode is selected.
The current drain is reduced to approximately lOmA during the Saver period. Thus, the average current drain is less for the total cycle time (260 milliseconds) and is approximately 25 mA.

(Subject to change without notice)

General

Number of Channels	1-32 (64 option available)
Frequency Range	
SCV32	138-174MHz(VHF)
SCU32A	430-430MHz(UHF)
SCU32B	450-480MHz(UHF)
Operational Bandwidth	15MHz(VHF); 20MHz(UHF)
Channel Spacing	30kHz(VHF); 25kHz(UHF)
Channel Increments	2.5kHz(VHF)
	5kHz/6.25kHz(UHF)
Size (with BPSCI; W x D x H)	6.22 x 3.50 x 16.26 cm
Weight (with BPSC1 and Antenna)	0.44 kg (15.5 oz)
Power Requirements	
Battery Voltage	10.8VNominal
Current Drain	
Squelched(w/Power Saver)	25mA, Typical
Squelched(w/out Power Saver)	40mA, Max. (VHF)
	45mA, Max. (UHF)
Rated Audio	l50mA, Max.
Transmit -1Watt(SCV32)	650mA
1Watt(SCU32)	750mA
Transmit -5Wafts(SCV32)	1350mA

	4Watts(SCU32) 145OmA
Antenna Impedance	50 Ohms
Speaker Impedance	8 Ohms
Frequency Stability	± 5 PPM Max.
Operating Temperature	-30'C to + 60'C
	-22'F to + 140'F
RCC Memory	
Scratch Pad	1 - 11 digits
ANI	1 - 7 digits

Receiver

Sensitivity (12dB SINAD)	0.25uV Max.
Threshold Squelch	0.20uV Max.
Selectivity (Adjacent Channel)	-75dB Min. (VHF)
	-70dB Min. (UHF)
Spurious Rejection	-67dB Min.
Intermodulation	-70dB Min. (VHF)
	-67dB Min. (UHF)
Hum and Noise Ratio	-40dB Min.
Rated Audio Output	250mW Min.
Audio Distortion @ 0.25W	10% T. H. D. Max.
Scan Rate	10 Ch/Sec.
Priority Sampling Rate	Once every two seconds

Transmitter

RF Output Power	
SCV32	5W/lW, ± ldB
SCU32	4W/lW,± ldB
Spurious/Harmonic Emissions	-70dBc Min. (VHF)
	-63dBc Min. (UHF)
Modulation	±5kHz
FM Hum and Noise	-4OdB Min.
Audio Distortion	5% Max.
Emission Designator	
8/16K0F3E	
14K8F1D	
7K4F1D	

REVIEW MODE

The program or operational data presently in the Radio can be reviewed (but not changed) by performing the following steps.

1. If not already ON, turn the Radio ON.
2. While holding down the **FUNC** button, press the **M/S** key.
3. The display will show:

4. Enter a 2-digit number, either “00” for the Radio’s Configuration Parameter data, “0#” for the Unit’s Automatic Number Identification (ANI) Code, or “0l through “32” for Channel data.

   a. For “00”, the display will show (for approximately 2 seconds) a 6-digit number that is the Selection Codes for the Unit’s Configuration Parameters or Options. For example:

See Table 1 below for details.)

Table 1. Configuration Parameter vs. Selection Code.

Configuration Parameter or 0ption	Selection Code 0	1	2	3	4	5	6	7	8	9
RCC Mode	dis	enl								
SCAN/RCC DELAY	1/2	1	2	3	4	5	6	7	8	9
TIME-OUT-TIMER	dis.	15	30	60						
BCL	dis.	enl.								
DTMF ENCODE	Fp	EP								
Channel Selector Lock	dis.	enl.								

NOTE: All times (Delay and Timer) are in seconds.
dis.=disabled; enl.=enabled; FP=First PTT press; EP=Every PTT press

(1) RCC Mode = disabled = “0”
(2) Scan/RCC Delay = 3 seconds = “3”
(3) Time-Out-Timer = disabled = “0”
(4) BCL = enabled “I”
(5) DTMF Encode Every PTT press = “1”
(6) Channel Selector Lock = disabled = “0”

b. For “0#”, the Unit’s ANI Code consisting of 1 to 7 digits (numbers only) is displayed for approximately 2 seconds.

c. For “0l “ through “32”, the display will show 6 screens for each Channel Number entered. Each screen will be shown for approximately 2 seconds.

NOTE: If a number is entered for a non-programmed or deleted channel, the display will very briefly show the channel number and then revert to:

The 6 screens, with examples, are:

Screen “1” displays the 6- or 8-digit RX Frequency in MHz.

(See page 27 for 8-digit example)

Screen “2” displays the 3-digit RX CTCSS Tone or DCS Code.

(009 = CTCSS Tone 91.5 Hz; see Table 2, page 28. For DCS, See Table 3 starting on page 28.)

Screen “3” displays the 4-digit RX DTMF Tones.

(0000 = no DTMF tones or decoding)

NOTE: For display purposes, * is represented as ⊦ and # as =.

Screen “4” displays the 6- or 8-digit TX Frequency in MHz.

SCV32 Example

or

SCU32 Example

Screen “5” displays the 3-digit TX CTCSS Tone or DCS Code.

(01 8 = CTCSS Tone 123.0 Hz)

Screen “6” displays the 4-digit TX DTMF Tones.

(0000 = no DTMF tones or encoding)

NOTE:	For display purposes, * is represented as 1, and as# =-.

5. After the data is shown, the display reverts to:

and the Unit is ready for another 2-digit selection.

6. To exit the Review Mode:

   a. Do not press any Key for at least 5 seconds, or
   b. Turn the Channel Selector knob, or
   c. Turn the Unit OFF and then back ON.

   After any one of these three actions, the Unit automatically returns to the same mode and the same channel, if in the MANUAL Mode, as before entering the Review Mode.

Table 2. SC32 Tone Codes vs. CTCSS Tones.

SC32 Code	Tone (Hz)	SC32 Code	Tone (Hz)	SC32 Code	Tone (Hz)
000	No Tone	017	118.8	034	218.1
001	67.0	018	123.0	035	225.7
002	71.9	019	127.3	036	233.6
003	74.4	020	131.8	037	241.8
004	77.0	021	136.5	038	250.3
005	79.7	022	141.3	039	69.4
006	82.5	023	146.2	040	159.8
007	85.4	024	151.4	041	165.5
008	88.5	025	156.7	042	171.3
009	91.5	026	162.2	043	177.3
010	94.8	027	167.9	044	183.5
011	97.4	028	173.8	045	189.9
012	100.0	029	179.9	046	196.6
013	103.5	030	186.2	047	199.5
014	107.2	031	192.8	048	206.5
015	110.9	032	203.5	049	229.1
016	114.8	033	210.7	050	254.1

Table 3. SC32 Tone Codes vs. DCS Codes.

STD SC32 Code	DCS Code		INV SC32 Code
	STD	INV	
051	023	047	58
052	025	244	090
053	026	464	127
054	031	627	141
055	032	051	059
056	036	172	082
057	043	445	121
058	047	023	051
059	051	032	055
060	053	452	123
061	054	413	117
062	065	271	100
063	071	306	102
064	072	245	091

STD SC32 Code	DCS Code		INV SC32 Code
	STD	INV	
086	223	134	074
087	225	122	070
088	226	411	115
089	243	351	110
090	244	025	052
091	245	072	064
092	246	523	133
093	251	165	081
094	252	462	126
095	255	446	122
096	261	732	151
097	263	205	084
098	265	156	079
099	266	454	124

STD SC32 Code	DCS Code		INV SC32 Code
	STD	INV	
065	073	506	131
066	074	174	083
067	114	712	148
068	115	152	077
069	116	754	154
070	122	225	087
071	125	365	113
072	131	364	112
073	132	546	136
074	134	223	086
075	143	412	116
076	145	274	101
077	152	115	068
078	155	731	050
079	156	265	098
080	162	503	130
081	165	251	093
082	172	036	056
083	174	074	066
084	205	263	097
085	212	356	111

STD SC32 Code	DCS Code		INV SC32 Code
	STD	INV	
100	271	065	062
101	274	145	076
102	306	071	063
103	311	664	146
104	315	423	118
105	325	526	134
106	331	465	128
107	332	455	125
108	343	532	135
109	346	612	139
110	351	243	089
111	356	212	085
112	364	131	072
113	365	125	071
114	371	734	152
115	411	226	088
116	412	143	075
117	413	054	061
118	423	315	104
119	431	723	149
120	432	516	132

Table 3. SC32 Tone Codes vs. DCS Codes (Continued).

STD SC32 Code	DCS Code		INV SC32 Code
	STD	INV	
121	445	043	057
122	446	255	095
123	452	053	060
124	454	266	099
125	455	332	107
126	462	252	094
127	464	026	053
128	465	331	106
129	466	662	145
130	503	162	080

Table 3. SC32 Tone Codes vs. DCS Codes (Continued).

STD SC32 Code	DCS Code		INV SC32 Code
	STD	INV	
131	506	073	065
132	516	432	120
133	523	246	092
134	526	325	105
135	532	343	108
136	546	132	073
137	565	703	147
138	606	631	142
139	612	346	109
140	624	632	143
141	627	031	054
142	631	606	138
143	632	624	140
144	654	743	153
145	662	466	129
146	664	311	103
147	703	565	137
148	712	114	067
149	723	431	119
150	731	155	0781
151	732	261	096
152	734	371	114
153	743	654	144
154	754	116	069

DCS stands for Digital Coded Squelch.

NOTE:
For communication systems
utilizing only SCV32 or SCU32 transceivers, it is recommended that Standard (STD) DCS Codes be used.

For existing communication systems employing DCS, it may be necessary to use the Inverted (INV) DCS and corresponding SC32 Code forproper transceiver operation. Inverted DCS is also referred to as “complemented DCS”.