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PRO-93
Handheld Scanner

Owner's Manual
Please read before using this equipment.

Contents

Will add

Features

Your RadioShack Handheld Scanner is one of a new generation of scanners designed to track Motorola® Type I and II (such as Smartnet® and Privacy Plus®) and hybrid analog trunking systems, and GE/Ericsson (EDACS®) type systems, which are extensively used in many communication systems.

Trunking communications systems let a large group of 2-way radio users (or even different groups of 2-way radio users) efficiently use a set of frequencies. Instead of selecting a specific frequency for a transmission, the user simply selects a talk group. The trunking system automatically transmits the call on the first available frequency, and also sends a code that uniquely identifies that transmission.

Since the trunking system might send a call and its response on different frequencies, it is difficult to listen to trunked communications using a regular scanner. The scanner monitors the data sent with a 2-way radio transmission, so you can hear the call and response for that user and more easily "follow" the conversation.

The scanner also lets you scan conventional transmissions, and is preprogrammed with service search banks for convenience. By pressing a single button, you can quickly search those frequencies most commonly used by public service and other agencies without tedious and complicated programming.

This scanner gives you direct access to over 59,000 frequencies including those used by police and fire departments, ambulance services, government agencies, air, and amateur radio services.

Your scanner includes these features:

Simultaneous Trunking Operation – tracks two trunking systems (Motorola and EDACS) and conventional systems at the same time.

10 Channel-Storage Banks – let you store 30 channels in each bank (300 channels) to group channels so calls are easier to identify.

10 ID-Storage banks – let you store 1,000 IDs in 10 ID banks, each ID bank has 5 sub-ID banks, 20 IDs are programmed in each sub-ID bank and let you easy identify the ID code.

12-Character, 4-Line, Dot-Matrix Display – shows you detailed operating information and lets you easily program the scanner.

Weather Alert – automatically sounds the alarm tone to advise of hazardous weather conditions when it detects the alert signal on the local National Oceanic and Atmospheric Administration (NOAA) weather channel during priority operation.

Digital Weather Alert – displays the weather event text with three alert levels so you can see and hear the reason for the alert.

Preprogrammed Frequency Ranges – lets you search for transmissions within preset frequency ranges or within ranges you set, to reduce search time and select interesting frequencies more quickly.

Data Cloning – lets you transfer the programmed data to another PRO-93 or PRO-2053 scanner. You can also upload or download the programmed data to or from a PC using an optional interface kit.

Triple Conversion Superheterodyne Receiver – virtually eliminates any interference from intermediate frequency (IF) images, so you hear only the frequency you select.

Hyperscan TM and Hypersearch TM – the scanner scans and searches at up to 60 channels per second, to help you quickly find interesting transmissions.

Scan Delay – delays scanning for about 2 seconds before moving to another channel in conventional mode, so you can hear more replies that are made on the same channel.

Priority Channel – you can set the scanner to check one channel every 2 seconds so you do not miss important calls.

Signal Attenuation (Attenuate) – lets you program in your scanner to reduce the scanner's sensitivity to strong local signals, to reduce interference or noise caused by these signals.

Text Input – lets you input a text label for each channel, talk group ID, bank, or other memory location so you can easily know about the transmission you are hearing.

Lock Out Function – lets you set your scanner to skip over specified channels or frequencies when scanning or searching, and skip over IDs when tracking trunked systems.

Key Lock – lets you lock the scanner's keys to help prevent accidentally changing the scanner's programming.

Flexible Antenna with BNC Connector – provides excellent reception and is designed to help prevent antenna breakage.

Memory Backup – keeps the frequencies stored in memory for an extended time even without internal batteries.

Three Power Options – let you power the scanner with internal batteries (non-rechargeable batteries or rechargeable batteries). You can also use an AC adapter (not supplied) or power the scanner in a vehicle using a DC adapter (not supplied).

Supplied Police Call Trunking Guide – provides a quick reference to public safety trunking radio systems in the United States.

Your scanner can receive these frequencies:

. 25—54 MHz
. 108—136.9875 MHz
. 137—174 MHz
. 216—225 MHz
. 406—512 MHz
. 806—823.9875 MHz
. 849—868.9875 MHz
. 894—960 MHz
. 1240—1300 MHz

This Owner's Manual also includes the section "A General Guide to Scanning" on Page XX to help you target frequency ranges in your service area so you can search for a wide variety of transmissions.

FCC NOTICE

Your scanner might cause TV or radio interference even when it is operating properly. To determine whether your scanner is causing the interference, turn off your scanner. If the interference goes away, your scanner is causing the interference. Try the following methods to eliminate the interference.

. Move your scanner away from the TV or radio.
. Connect your scanner to an outlet that is on a different electrical circuit from the TV or radio.
. Contact your local RadioShack store for help.

If you cannot eliminate the interference, the FCC requires that you stop using your scanner.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: (1) this device must not cause harmful interference, and (2) this device must accept any interference received,

including interference that may cause undesired operation.

Note: Mobile use of this scanner is unlawful or requires a permit in some areas. Check the laws in your area.

SCANNING LEGALLY

Scanning is a fun and interesting hobby. You can hear police and fire departments, ambulance services, government agencies, private companies, amateur radio services, aircraft, and military operations. It is legal to listen to almost every transmission your scanner can receive. However, there are some electronic and wire communications that are illegal to intentionally intercept. These include:

. telephone conversations (cellular, cordless, or other private means of telephone signal transmission)
. pager transmissions
. scrambled or encrypted transmissions

According to the Federal Electronic Communications Privacy Act (ECPA), as amended, you could be fined and possible imprisoned for intentionally listening to, using, or disclosing the contents of such a transmission unless you have the consent of a party to the communication (unless such activity is otherwise illegal). These laws change from time to time and there might be state or local laws that also affect legal scanner usage.

Preparation

POWER SOURCES

You can power your scanner from any of three sources:

. internal non-rechargeable batteries or rechargeable batteries (not supplied – see "Using Batteries" on Page XX)
. standard AC power (with an optional AC adapter – see "Using AC Power" on Page XX)
. vehicle power (with an optional DC adapter – see "Using Vehicle Power" on Page XX)

Notes:
. Connecting an AC or DC adapter to the scanner disconnects internal batteries when you use the supplied non-rechargeable battery holder, but it does not disconnect internal batteries when you use the supplied rechargeable battery holder.
. If you install the rechargeable battery holder, you can operate the scanner and recharge the rechargeable batteries at the same time. See "Using Batteries" below and "Charging Rechargeable batteries" on Page XX.
. If the scanner stops working properly after connecting it to power, try resetting it. See "Resetting/Initializing the Scanner" on Page XX.

Using Batteries

You can power the scanner with four AA batteries. For the longest operation and best performance, we recommend alkaline batteries, available at your local RadioShack store.

You can use either the supplied non-rechargeable black battery holder, or the supplied rechargeable yellow battery holder. If you use the rechargeable battery holder, we recommend RadoShack nickel-metal hydride batteries.

Warning: Never install non-rechargeable batteries in the rechargeable yellow battery holder. Non-rechargeable batteries can get hot or explode if you try to recharge them.

Note: You must charge rechargeable batteries before you use them the first time. See "Charging Rechargeable Batteries" on Page XX.

Follow these steps to install the batteries.

1. Press down on the battery compartment cover on the back of the scanner and slide the cover in the direction of the arrow to remove it.

2. Pull out and slide the battery holder out of the battery compartment.

3. If you are using non-rechargeable batteries, place them into the black holder, as indicated by the polarity symbols (+ and -) marked on the holder. Or, if you are using rechargeable batteries, place them into the yellow holder as indicated by the polarity symbols (+ and-) marked on the holder.

Cautions:
. Use only fresh batteries of the required size and recommended type.
. Always remove old or weak batteries. Batteries can leak chemicals that destroy electronic circuits.
. Do not mix old and new batteries, different types of batteries (alkaline or rechargeable), or rechargeable batteries of different capacities.

4. Place the battery holder into the battery compartment.

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Caution: The battery holder fits only one way. Do not force it.

5. Replace the cover.

When battery power is low, Low Battery! Appears and the scanner beeps continuously. When battery power is depleted, the scanner turns itself off. Replace all four non-rechargeable batteries, or recharge the rechargeable batteries. See "Charging Rechargeable Batteries."

Warning: Always dispose of old batteries promptly and properly. Do not bury or burn them.

Caution: If you do not plan to use the scanner with batteries for a month or longer, remove the batteries. Batteries can leak chemicals that can destroy electronic parts.

Charging Rechargeable Batteries

Your scanner has a built-in charging circuit that lets you charge rechargeable batteries (not supplied) while it is in the scanner. To charge rechargeable batteries connect an appropriate AC or DC adapter to the PWR DC 9V jack. We recommend RadioShack rechargeable Nickel-Metal Hydride 1500mA/h batteries.

Note: To charge batteries with a DC adapter from a DC power source, you must use RadioShack Cat. No. 273-1810 or 273-1815 and a size C Adaptaplug® (neither supplied) available at your local RadioShack store. Make sure the adapter's voltage is set to 9V.

It takes about 15 hours to recharge rechargeable batteries that are fully discharged 1500mA/h NiMH batteries. You can operate the scanner while recharging the rechargeable batteries, but charging takes longer.

Notes:

. The scanner can also charge Ni-Cd batteries. 600mA/h batteries require 6 hours and 850mA/h batteries require 8 hours to charge.
. When you charge Ni-Cd batteries, please pay attention not to over charge. Over charge makes short batteries life.
. Rechargeable batteries last longer and deliver more power if you let them fully discharge once a month. To do this, use the scanner until Low Battery! appears. Then fully charge the rechargeable batteries.

Important: The EPA certified RBRC® Battery Recycling Seal on the nickel-cadmium (Ni-Cd) battery indicates RadioShack is voluntarily participating in an industry program to collect and recycle these batteries at the end of their useful life, when taken out of service in the United States or Canada. The RBRC program provides a convenient alternative to placing used Ni-Cd batteries into the trash or the municipal waste stream, which may be illegal in your area. Please call 1-800-THE-SHACK (1-800-843-7422) for information on Ni-Cd battery recycling and disposal bans/restrictions in your area. RadioShack's involvement in this program is part of the company's commitment to preserving out environment and conserving our natural resources.

Using AC Power

You can power the scanner using a 9V, 300 mA AC adapter and a size C Adaptaplug (neither supplied). We recommend RadioShack Cat. No. 273-1767 (available at your local RadioShack store).

Cautions:

! You must use a Class 2 power source that supplies 9V DC and delivers at least 300 mA. Its center tip must be set to positive and its plug must fit the scanner's PWR DC 9V jack. Using an adapter that does not meet these specifications could damage the scanner or the adapter.
. Always connect the AC adapter to the scanner before you connect it to AC power. When you finish, disconnect the adapter from AC power before you disconnect it from the scanner.

Follow these steps to connect the adapter.

1. Connect the Adaptaplug to the adapter's cord with the tip set to positive.

2. Plug the adapter's barrel plug into the scanner's PWR DC 9V jack.

3. Plug the adapter into a standard AC outlet.

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Using Vehicle Power

You can power the scanner from a vehicle's 12V power source (such as a cigarette-lighter socket) using a 9V, 300 mA DC adapter and a size C Adaptaplug (neither supplied). We recommend RadioShack Cat. No. 273-1810 (available at your local RadioShack store).

Cautions:

! You must use a power source that supplies 9V DC and delivers at least 300 mA. Its center tip must be set to positive and its plug must fit the scanner's PWR DC 9V jack. Using an adapter that does not meet these specifications could damage the scanner or the adapter.
. Always connect the DC adapter to the scanner before you connect it to the power source. When you finish, disconnect the adapter from the power source before you disconnect it from the scanner.

Follow these steps to connect the adapter.

1. Connect the Adaptaplug to the adapter's cord with the tip set to positive.

2. Plug the adapter's barrel plug into the scanner's PWR DC 9V jack.

3. Plug the adapter's cigarette-lighter plug into your vehicle's cigarette-lighter socket.

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Note: If the scanner does not operate properly when you connect a DC adapter, unplug the DC adapter from the cigarette-lighter socket and clean the socket to remove ashes and other debris.

CONNECTING THE ANTENNA

Follow these steps to attach the supplied flexible antenna to the ANT jack on the top of your scanner.

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1. Align the slots around the antenna's connector with the tabs on the ANT jack.

2. Press the antenna down over the jack and turn the antenna's base clockwise until it locks into place.

Connecting an Optional Antenna

The antenna connector on your scanner makes it easy to use the scanner with a variety of antennas, such

as an external mobile antenna or outdoor base station antenna. Your local RadoShack store sells a variety of antennas.

Always use 50-ohm coaxial cable, such as RG-58 or RG-8, to connect an outdoor antenna. For lengths over 50 feet, use RG-8 low-loss dielectric coaxial cable, If your antenna's cable does not have a BNC connector, you will also need a BNC adapter (also available at your local RadioShack store).

Follow the installation instructions supplied with the antenna, route the antenna cable to the scanner, then connect it to the ANT jack.

Warning: Use extreme caution when installing or removing an outdoor antenna. If the antenna starts to fall, let it go! It could contact overhead power lines. If the antenna touches a power line, contact with the antenna, mast, cable or guy wires can cause electrocution and death! Call the power company to remove the antenna. Do not attempt to do so yourself.

CONNECTING AN EARPHONE/HEADPHONES

For private listening, you can plug an earphone or mono/stereo headphones (not supplied), available at your local RadoShack store, into the (headphone symbol) jack on top of your scanner. This automatically disconnects the internal speaker.

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Listening Safely

To protect your hearing, follow these guidelines when you use an earphone or headphones:

. Do not listen at extremely high volume levels. Extended high-volume listening can lead to permanent hearing loss.
. Set the volume to the lowest setting before you begin listening. After you begin listening, adjust the volume to a comfortable level.
. Once you set the volume, do not increase it. Over time, your ears adapt to the volume level, so a volume level that does not cause discomfort might still damage your hearing.

Traffic Safety

Do not wear an earphone or headphones while you drive a vehicle or ride a bicycle. This can create a traffic hazard and can be illegal in some areas.

Even though some earphones and headphones let you hear some outside sounds when you listen at normal levels, they still can present a traffic hazard.

CONNECTING AN EXTENSION SPEAKER

In a noisy area, an amplified speaker (not supplied), available at your local RadioShack store, might provide more comfortable listening. Plug the speaker cable's 1/8-inch (3.5 mm) mini-plug into your scanner's

(headphone symbol) jack.

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Note: You must use an amplified speaker with this scanner. Non-amplified speakers do not provide sufficient volume for comfortable listening.

USING THE BELT CLIP

You can use the belt clip attached to the back of the scanner for hands-free carrying when you are on the go. Slide the belt clip over your belt or waistband.

CONNECTING THE CLONE CABLE

You can transfer the programmed data to and from another PRO-93 or PRO-2053 using the clone cable (not supplied). We recommend RadioShack Cat. No. 42-2420. Connect the cable between each scanner's PC/IF jacks. See "Cloning the Programmed Data from Scanner to Scanner" on Page XX. You can also upload or download the programmed data to or from a PC using an optional PC interface kit available by special order from your local RadioShack store.

About Your Scanner

Once you understand a few simple terms used in this manual and familiarize yourself with your scanner's features, you can put the scanner to work for you. You simply determine the type of communications you want to receive, then set the scanner to scan them.

A frequency is the receiving signal location (expressed in kHz or MHz). To find active frequencies, you can use the search function.

You can also search the SEARCH banks, which are preprogrammed frequencies in the scanner's memory (see "Searching a Preprogrammed Frequency Range" on Page XX for the frequency list). You can change the one SEARCH band (SR5) frequency ranges.

When you find a frequency, you can store it into a programmable memory location called a channel, which is grouped with your other channels in a channel-storage bank. You can then scan the channel-storage banks to see if there is activity on the frequencies stored there. Each time the scanner finds an active frequency, it stays on that channel until the transmission ends. See "Trunking Operation" on Page XX for terms related to trunking systems.
SCAN – scans through the programmed channels.

FUNC (function) – lets you use various functions by pressing this key along with other keys.

MANUAL – stops scanning and lets you directly enter a channel number.

WX – scans through the 7 preprogrammed weather channels.

TRUNK – stores the trunking ID code or holds the trunking ID while scanning.

PRI (Priority) – sets and turns the priority function on or off.

TEXT – lets you input text.

PAUSE – stops search or scan.

MODE – changes the receive mode (AM, FM, MO, ED). See "Changing the Receive Mode" on Page XX.

(Light Symbol)/(Key Symbol)– turns on/off the display's backlight or locks/unlocks the keypad to prevent accidental entries.

TUNE – lets you input a frequency and allows you to fine tune a frequency along with /¥ or ¥/.

ATT (Attenuate) – turns attenuation on to reduce the scanner's sensitivity, or turns it off to increase it.

/¥ or ¥/ – selects the search direction during frequency search or tuning.

SEARCH – lets you search the six search banks.

L/OUT (Lock Out) – lets you lock out a selected channel, skip a specified frequency during search, or lock out a selected ID code.

PGM – programs frequencies into channels.

ENTER – lets you complete the entry of frequencies and text.

A LOOK AT THE KEYPAD

Your scanner's keys might seem confusing at first, but this information should help you understand each key's function.

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1 – enters a 1, or inputs characters 0 through 9.

2/ABC – enters a 2, or inputs characters A, B, or C.

3/DEF – enters a 3, or inputs characters D, E, or F.

4/GHI – enters a 4, or inputs characters G, H, or I.

5/JKL – enters a 5, or inputs characters J, K, or L.

6/MNO – enters a 6, or inputs characters M, N, or O.

7/PQRS – enters a 7, or inputs characters P, Q, R, or S.

8/TUV – enters a 8, or inputs characters T, U, or V.

9/WXYZ – enters a 9, or inputs characters W, X, Y, or Z.

0 – enters a zero, or inputs characters . , -, #, _, @, +, *, &, /, ‘, $, %, !, ^, (,), ?, ->, ` or <-.

./DELAY – enters a decimal point (necessary when programming frequencies), space, or programs delay time for the selected channel/search bank, or hyphen (in Motorola type I code setting).

CL – clears an incorrect entry.

A LOOK AT THE DISPLAY

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UNDERSTANDING BANKS

Channel Storage Banks

To make it easier to identify and select the channels you want to listen to, channels are divided into 10 banks (0—9) or 30 (00 to 29) channels each. Use each channel-storage bank to group frequencies, such as those used by the Motorola trunking, EDACS trunking, Marine, CB, Police, Fire, Aircraft and Ham (see “Typical Band Usage” on Page XX). For example, police department might use four frequencies, one for each side of the town. You could program the police frequencies starting with 000 (the 1st channel in bank 0) and program the fire department frequencies starting with 100 (the 1st channel in bank 1). The 1st digit identifies the bank (0-9). The 2nd and 3rd digits identify the channel within the bank (00-29).

Search Banks

This scanner has five preprogrammed search bands plus one limit search band. You can set the lower and higher frequency limit in limit search band. (For the default setting, see “Searching a Preprogrammed Frequency Range” on Page XX.)

UNDERSTANDING YOUR SCANNER’S MODES

You can program each channel with any of four receive modes except VHF band (no MO or ED mode in VHF)). Each mode affects how your scanner operates when scanning and receiving transmissions, and also affects what transmissions you receive when you set the scanner to the closed mode (see “Open and Closed Modes” on Page XX). The following sections describe each mode and how they affect your scanners operation. See “Changing the Receive Mode” on Page XX.

In all major metropolitan areas of the United States, every available radio channels is assigned to more than one user. Public safety radio systems on the same frequency are usually set up at a distance of 40 miles apart, or more. This means that you may hear transmissions from a distant system when your local system is not transmitting.

Open and Closed Modes

You can set your scanner to change the way it receives signals. These settings, called open mode and closed mode, affect how the scanner receives signals from communications systems that use some type of closed squelch (such as MOT, and ED systems).

You can set each of the scanner's channel storage ID banks to open or closed mode.

In open mode, the scanner scans signals transmitted in all systems. In closed mode, the scanner scans signals transmitted only under the following conditions:

. When the signals are in the FM mode.
. When the signals are in the MO, or ED mode and the signal's ID code matches the programmed ID code.

You can also select the users or talk groups you want the scanner to receive in closed mode.

When you set a channel storage bank to open mode, + (open) appears under the bank's number while scanning. When you set a channel storage bank to closed mode, - (closed) appears under the channel storage bank's number while scanning. Or, OPEN or CLOSED appears while the scanner is in manual mode or while the scanner is receiving a signal during scanning.

See "Changing the Open/Closed Mode" on Page XX for more information about setting the open and closed modes.

AM Mode

This sets the scanner to receive transmissions using amplitude modulation (AM). AM is used for aircraft, military, some amateur radio, and some government transmissions. When the scanner receives a transmission on a channel set to the AM mode, it always stops on the transmission.

FM Mode

This sets the scanner to receive transmissions using frequency modulation (FM). FM is used for most public safety transmissions, as well as broadcast, business, and amateur radio transmissions. When the scanner receives a transmission on a channel set to the FM mode, it always stops on the transmission.

Motorola Mode

You can set your scanner so it decodes the talk group IDs used with Motorola trunking systems. This setting is called the Motorola mode.

Motorola systems are trunking systems used primarily by business and public safety groups to efficiently allocate a small number of frequencies (as few as 5) to many groups of users (as many as several thousand). To do this, each group of users in the system is assigned to a specific talk group. For example, the east side patrol officers might all be assigned to talk group 2160. One channel in the system is continuously transmitting data that identifies which talk groups are active on which channel. In addition, this talk group information is also transmitted as subaudible data on each active channel.

When the scanner receives a transmission on a channel set to the Motorola mode, it first decodes the talk group ID data included with the transmission. In the open mode, the scanner stops on the transmission and displays the talk group ID on the bottom line of the display. In the closed mode, the scanner only stops on the transmission if the talk group ID matches a talk group ID that you have stored in the bank's talk group ID list and have not locked out.

Motorola trunking systems come in three categories: Type I, Type II, and Type I/II Hybrid. Each category displays and uses talk group IDs in slightly different ways.

Motorola Type I IDs are in the form FFF-SS, where:

FFF=Fleet ID
SS=Subfleet ID

Type I systems are usually organized with different user groups assigned to different fleets. For example, a valid fleet/subfleet ID identifying all detectives within a police department might be 000-12, where 000 identifies all police users and 12 identifies the Detective division.

To properly map the raw Type I data to the correct fleet-subfleet format, you must program the correct fleet map into the scanner. Fleet map information is widely available on the Internet for most Type I systems in use.

Type II system talk groups are identified by a 5-digit number. Valid talk group IDs are divisible by 16. If you try to enter an invalid talk group ID, the scanner rounds the ID down to the next valid ID.

Type I/II hybrid systems use both fleet-subfleet and 5-digit formats for talk group IDs.

Note: If the scanner decodes control channel data while receiving transmissions from a Motorola trunking system, CNTRL appears on the bottom line of the display.

EDACS Mode

You can set your scanner so it decodes the talk group IDs used with EDACS (GE/Ericsson) trunking systems. This setting is called the EDACS mode.

EDACS systems are trunking systems used primarily by business or private communications service providers, as well as by some public safety organizations. EDACS systems transmit active talk group information only on a dedicated control channel.

EDACS frequencies are organized in a specific order. Each frequency is assigned a Logical Channel Number (LCN). For the scanner to correctly switch to an active frequency, you must program the frequencies in LCN order, starting with Memory 01. EDACS talk group IDs are entered as a 4-digit decimal number from 0001 to 2047 or AFS (Agency Fleet Subfleet) number from 00-001 to 15-157.

When there is activity on an EDACS system, that information is sent out on the control channel. The scanner decodes the ID for the active talk group. In the open mode, the scanner then goes to the transmission and displays the talk group ID on the bottom line of the display. In the closed mode, the scanner only goes to transmissions with IDs that match talk group IDs you have stored in the bank's talk group ID list which are not locked out.

Because EDACS scanning requires clear reception of the control channel at all times, EDACS systems tend to have a smaller usable area. An external antenna can greatly improve EDACS scanning in a fringe area. If you are having trouble scanning an EDACS system, try manually selecting the data channel. If you are getting good reception, the scanner will indicate talk group CTL-01. Try changing your location or using an outdoor antenna to improve reception.

Operation

TURNING ON THE SCANNER AND SETTING SQUELCH

1. Turn SQUELCH fully counterclockwise until the indicator points to MIN before you turn on the scanner.

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2. To turn on the scanner, turn VOLUME clockwise. Welcome To Dual Trunking appears. After about 3 seconds, you hear a hissing sound.

3. Turn SQUELCH clockwise, just until the hissing sound stops.

4. To turn off the scanner when you finish, turn VOLUME counterclockwise to OFF.

Notes:
• The scanner does not scan if there are no frequencies stored in channels. If the scanner does not scan and you have already stored frequencies in channels, turn SQUELCH further clockwise.
• If the scanner picks up unwanted, partial, or very weak transmissions, turn SQUELCH clockwise to decrease the scanner's sensitivity to these signals. If you want to listen to a weak or distant station, turn SQUELCH counterclockwise.
• If SQUELCH is adjusted so you always hear a hissing sound, the scanner will not scan properly.
• To ensure the scanner operates properly while in the trunking mode, we suggest you set SQUELCH using the above steps, even if the scanner is automatically muted.

STORING KNOWN FREQUENCIES INTO CHANNELS

Good references for active frequencies are RadioShack's Police Call, Aeronautical Frequency Directory, and Maritime Frequency Directory. We update these directories every year, so be sure to get a current copy. Also see the supplied Police Call Trunking Guide.

Follow these steps to store frequencies into channels.

1. Press MANUAL, enter the channel number where you want to store a frequency, then press MANUAL again. M and the channel number appear at the upper left corner of the display (for example: M100).

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Notes:
You can also select your desired bank and channel number by follow those steps while program mode.
1). Press FUNC then /¥ (¥/) and the bank number moves upward (downward).
2). Press FUNC then press and hold /¥ (¥/) and the bank number moves upward (downward).
3). Press PGM or /¥ and the channel number moves upward one by one.
4). Press down and the channel number moves downward one by one.

2. Press PGM. M changes to P.

3. Use the number keys and •/DELAY to enter the frequency (including the decimal point) you want to store.

If you make a mistake, hold down CL for about 1 second to delete a single digit and about 2 seconds to delete all digits.

4. Press ENTER to store the frequency into the channel. The blinking cursor disappears.

Notes:
• If you made a mistake in Step 3, Invalid Freq briefly appears and the scanner beeps when you press ENTER. Starts again from Step 3.
• Your scanner automatically rounds the entered frequency to the nearest valid frequency. For example, if you enter a frequency of 151.473, your scanner accepts it as 151.470.
• Press •/DELAY to turn the delay function on or off. To have the scanner pause for 2 seconds on this channel after a transmission before proceeding to the next active transmission, see "Using the Delay Function" on Page XX. The scanner stores this setting in the channel.
• If you are storing frequencies for an EDACS system, you must store them in logical channel number order, with the first frequency in channel 1 for the current bank.

5. If necessary, press MODE to change the receiving mode.

6. If desired, program a text tag for the channel (see "Assigning a Text Tag to a Channel").

7. The next channel in sequence is ready for programming. Press PGM and then repeat Steps 3 through 5.

STORING TEXT TAGS
You can customize your scanner by storing text tags (up to 12 characters) for easy identification of channel

transmissions, trunk IDs, or banks.

Assigning a Text Tag to a Channel

1. Press MANUAL, enter the channel number where you want to enter the text, then press MANUAL again. M and the channel number appear at the upper left corner of the display (for example: M100).

2. Press PGM. M changes to P.

3. Press TEXT. The cursor appears at the 3rd line.

4. Enter the text using the numeral keys (see "Text Input Chart" on Page XX).

Note: If you make a mistake, press /¥ or ¥/ to move to the character you want to change.

For example input "HAM 6m" as follows:

• "H" is the second letter associated with 4 on the keypad. Press 4 then 2.
• "A" is the first letter associated with 2 on the keypad. Press 2 then 1.
• "M" is the first letter associated with 6 on the keypad. Press 6 then 1.
• "Space." Press • .
• "6" is the sixth number associated with 1 on the keypad. Press 1 then 6.
• "m" is the first letter associated with 6 on the keypad. Press 6 and FUNC (for the lower case set), then press 1.

5. Press ENTER to input the text.

Assigning a Text Tag to a Bank

1. Select a channel within the desired bank by pressing MANUAL and entering the bank number (000 for bank 0 or 200 for bank 2, for example). Press MANUAL again.

2. Press PGM.

3. Press FUNC then 7. The cursor appears at the 3rd line of the display. Enter the text using the keypad and press ENTER.

Text Input Chart

Notes:
• To access the numbers, after you press FUNC and 6, press 1, then press the desired number you want to enter.
• To enter a lowercase character or a character from the second set for key 0, press FUNC after pressing the first numeral key.

Press	To Enter Character from this Group
1	1 2 3 4 5 6 7 8 9 0
2	A B C
FUNC after press 2	a b c
3	D E F
FUNC after press 3	d e f
4	G H I
FUNC after press 4	g h i
5	J K L
FUNC after press 5	j k l
6	M N O
FUNC after press 6	m n o
7	P Q R S
FUNC after press 7	p q r s
8	T U V
FUNC after press 8	t u v
9	W X Y Z
FUNC after press 9	w x y z
0	. - # _ @ + * & / ‘
FUNC after press 0	$ % ! ^ ( ) ? -> ` <-
•	Space
CL	Back Space

FINDING AND STORING ACTIVE FREQUENCIES

You can search for transmissions in preprogrammed search banks. The search bank is divided into 6 search bands. You can change the search range in SR5. You can set the search lower end frequency and also higher end frequency manually.

Notes:
• You can use the scanner's delay feature while searching the service bank. See "Using the Delay Function" on Page XX.
• The scanner does not search locked-out frequencies while searching ranges.

Searching a Preprogrammed Frequency Range

The scanner contains those programmed search ranges, stored in search bank (0 – 5).

Bank	Band
SR0	Marine
SR1	CB
SR2	Police/Fire
SR3	Aircraft
SR4	Ham
SR5	Limit search

Search bank : SR0 Marine band

Receive mode : FM

CHANNEL	FREQUENCY (MHz)
01	156.050
05	156.250
06	156.3000
07	156.3500
08	156.4000
09	156.4500
10	156.5000
11	156.5500
12	156.6000
13	156.6500
14	156.7000
15	156.7500
16	156.8000
17	156.8500
18	156.9000
19	156.9500
20	157.0000/161.6000
21	157.0500
22	157.1000
23	157.1500
24	157.2000/161.8000
25	157.2500/161.8500
26	157.3000/161.9000
27	157.3500/161.9500
28	157.4000/162.0000
63	156.1750
64	156.2250/160.825
65	156.2750
66	156.3250
67	156.3750
68	156.4250
69	156.4750
70	156.5250
71	156.5750
72	156.6250
73	156.6750
74	156.7250
77	156.8750
78	156.9250
79	156.9750
80	157.0250
81	157.0750
82	157.1250
83	157.1750
84	157.2250/161.8250
85	157.2750/161.8750
86	157.3250/161.9250
87	157.3750/161.9750
88	157.4250

NOTE: Two frequencies are assigned in one channels in some Marine frequencies. Example: 20CH 157.000, 20CH 161.600

Search bank : SR1 CB band

Receive mode : AM

CHANNEL	FREQUENCY (MHz)
01	26.9650
02	26.9750
03	26.9850
04	27.0050
05	27.0150
06	27.0250
07	27.0350
08	27.0550
09	27.0650

10	27.0750
11	27.0850
12	27.1050
13	27.1150
14	27.1250
15	27.1350
16	27.1550
17	27.1650
18	27.1750
19	27.1850
20	27.2050
21	27.2150
22	27.2250
23	27.2550
24	27.2350
25	27.2450
26	27.2650
27	27.2750
28	27.2850
29	27.2950
30	27.3050
31	27.3150
32	27.3250
33	27.3350
34	27.3450
35	27.3550
36	27.3650
37	27.3750
38	27.3850
39	27.3950
40	27.4050

Search bank : SR2 Police/Fire bank

Receive mode : FM

GROUP	FREQUENCY (MHz)	STEP (kHz)
0	33.420-33.980	20
	37.020-37.420	20
	39.020-39.980	20
	42.020-42.940	20
	44.620-45.860	40
	45.880	-
	45.900	-
	45.940-46.060	40
	46.080-46.500	20
1	153.770-154.130	60
	154.145-154.445	15
	154.650-154.950	15
	155.010-155.370	60
	155.415-155.700	15
	155.730-156.210	60
	158.730-159.210	60
	166.250	-
	170.150	-
2	453.0375-453.9625	12.5
	458.0375-458.9625	12.5
	460.0125-460.6375	12.5
	465.0125-465.6375	12.5
3	856.2125-860.9875	25
	866.0125-868.9875	12.5

Search bank : SR3 Aircraft
Receive mode : AM

GROUP	FREQUENCY (MHz)	STEP (kHz)
	108.000-136.9875	12.5

Search bank : SR4 Ham band
Receive mode : FM

GROUP	FREQUENCY (MHz)	STEP (kHz)
0	28.0000 – 29.7000	5
1	50.0000 - 54.0000	5
2	144.0000 - 148.0000	5
3	222.0000 - 225.00000	5
4	420.0000 - 450.0000	12.5
5	1240.0000 - 1300.0000	6.25

Search bank : SR5 Programmable limit search
Receive mode : FM (Default setting)

Follow these steps to select preprogrammed search banks and searchs them for active frequencies.

1. Press SEARCH to select your desired search bank.

   Add ilast

2. In the marine and CB band you can select the channel by Manually or search. M marking at the top of the second line shows manual mode. S shows search. Press desired channel number while M indication with two digits to shift the channel. You can also change the channel by /¥ or ¥/ keys with search direction.

3. Press FUNC then SEARCH while M indication then M changes to S and set search mode. Press FUNC then SEARCH again to backward.

4. Rotates SQ control clockwise and leave it set to a point just after hissing sound stops. After the 2 seconds if Delay is turn on and LCD indicates Searching . . . to start search.

5. When the scanner finds an active frequency, it stops searching.

Search active frequency in your desired frequency range
You can program your desired frequencies range to search.
1. Press SEARCH and select SR5.

2. PGM then SEARCH. LCD indicates PSR for Program SeaRch at the top line and blinks L at the second line for lower-end limit frequency.

3. Press your desired lower-end limit frequency with number and decimal point key.

4. Press ENTER to set the frequency. If the entry frequency is incorrect it does not accept it, sounds invalid and back to before press the number.

5. If you want to change the high-end limit frequency then press /¥ or ¥/ key to select higher-end limit frequency entry.
6. Press your desired higher-end frequency and press ENTER.

7. Rotates SQ control clockwise and leave it set to a point just after hissing sound stops.

8. Press SEARCH and starts search. When the scanner finds an active frequency, it stops searching.

Special notes:
1. You can copy and save the frequency into a specified bank, channel, or priority channel when the scanner finds an active frequency. See page XX "Frequency Copy function" to save the frequency. Frequency copy functions only search bank 2, 3, 4 and 5.

2. You can set seek search by press FUNC then 7. LCD indicates Seek ON at the bottom line. While seek search it stops at the active frequency for five second and restart search automatically and repeats.

3. You can set Zeromatic on or off by press FUNC then 0. Press them again to reverse Zeromatic setting. While Zeromatic is turned on Z is indicated at the first digit of the second line and it stops at correct frequency. If it is set off (no indication) then it stops when detect active signal even it is slightly off. Zeromatic functions only search bank 2, 3, 4 and 5.

4. There are grouped bank in SR2 Police/Fire and SR4 Ham Band. You can turn off or on the group if press group number while in SR2 and SR4 search band.

5. Press FUNC then /¥ to start up search from the lowest frequency and press FUNC ¥/ to start down search from upper frequency in Air and Limit search band.

USING FREQUENCY COPY FUNCTION
You can copy the indicated receiving frequency into specified channel, vacant channel in the specified bank or priority channel.
Frequency in the Marine and CB band is not able to copy.

Copy the frequency in the specified channel
You can copy the indicated receiving frequency into specified channel when stops search or tune mode.

1. Press FUNC then PGM where you want to copy the indicated frequency.

2. Chan Store? appears at LCD bottom line. After about 1 second the frequency indication is changed to the copy frequency.

3. Press your desired bank and the channel number where you want to store. Then LCD indicates the bank and channel number. After about 1 second the copy frequency is blinked on the LCD.

4. Press ENTER then all the condition such as receiving mode and delay condition are copied on the channel. After indicates Chan Store! for about 2 seconds it automatically backed to search mode.

5. If you want to copy same frequency which already stored then sounds notice tone 3 times after step 1, LCD indicates the location bank number, channel number, the frequency and Dupl.f Chxxx is appeared at the LCD bottom line.

6. If you want to copy the duplicate frequency then press ENTER or press CLEAR to cancel.

Copy the frequency into the specified bank at vacant channel
You can copy the indicated receiving frequency into specified bank vacant channel when stops search or tune mode.

1. Press FUNC then ENT where you want to copy the indicated frequency.

2. Bank9 store? is appeared on the LCD.

3. If you want to copy it into the bank 9 then press ENTER. If same frequency is not stored then it is stored in the vacant channel in bank 9.

4. Or press your desired bank number to store. Then Chan Stored! Is indicated for 2 seconds. Then all the condition such as receiving mode and delay condition are copied on the channel. After about 2 seconds it automatically back to search mode.

5. If the frequency is already stored then Dupl.f Chxxx is appeared at the LCD bottom line.

6. If you want to copy the duplicate frequency then press ENTER or press CLEAR to cancel.

Copy the frequency into the priority channel
You can copy the indicated receiving frequency into priority channel when stop search, stop scan, manual, tune or WX mode.

1. Press FUNC then PRI where you want to copy the indicated frequency then the frequency is copied in priority channel.

2. It blinks Pri channel and it is stored.

SCANNING THE CHANNELS

To begin scanning channels or to start scanning again after monitoring a specific channel, press SCAN.

Note: You must store frequencies into channels before the scanner can scan them. The scanner does not scan at empty channels.

The scanner scans through all channels (except those you have locked out) in the active banks (see

"Turning Channel-Storage Banks Off and On" and "Locking Out Channels or Frequencies" on Page XX).

Turning Channel-Storage Banks Off and On

To turn off banks while scanning, press the bank's number key until the bank's number disappears. The scanner does not scan any of the channels within the banks you have turned off.

Notes:
• You cannot turn off all banks. There must be at least one active bank.
• You can manually select any channel in a bank, even if the bank is turned off.

To turn on banks while scanning, press the number key until the bank's number appears.

MANUALLY TUNING A FREQUENCY

1. Press TUNE.

2. Use the number keys to enter the frequency.

3. Press ENTER.

4. Press /¥ to move up one tuning step. Press ¥/ to move down one tuning step.

DELETING FREQUENCIES FROM CHANNELS

1. Press MANUAL.

2. Use the number keys to enter the channel with the frequency you want to delete.

3. Press MANUAL again.

4. Press PGM to enter the program mode. M changes to P.

5. Press FUNC.

6. Press CL. The frequency number changes and 0.0000 MHz appears.

LISTENING TO THE WEATHER BAND

The FCC (Federal Communications Commission) has allocated channels for use by the National Oceanic and Atmospheric Administration (NOAA). Regulatory agencies in other countries have also allocated channels for use by their weather reporting authorities.

NOAA and your local weather reporting authority broadcast your local forecast and regional weather information on one or more of these channels.

Listening to a Weather Channel

To hear your local forecast and regional weather information, press WX. Your scanner scans through the weather band then stops within a few seconds on the strong weather broadcast.

Displaying Weather Messages

The weather service precedes each weather alert with a digitally-encoded SAME signal, then a 1050 Hz tone. You can set the scanner so, if you are monitoring a weather channel with a digitally-encoded SAME signal when an alert is broadcast, the scanner will decode and display the SAME message, showing the type of alert being broadcast such as Waning, Watch, Statement, or Test message.

To set the scanner to decode and display SAME messages, press FUNC then WX while you listen to the weather channel. DIG WX STBY and Cancel : F+WX appear.

To set the scanner out of the SAME standby mode, press FUNC then WX again. DIG WX STBY disappears.

Notes:
• The scanner does not display the actual location referenced by SAME messages. It uses only the part of message portion of the SAME signal.
• Your scanner can also receive weather alert tones (see "Priority" on Page XX).

WX alert and beep tone confirmation
1. Press WX for more than 2 seconds while LCD indicates DIG WX STBY.

2. LCD indicates the type of message and sounds alert or beep and it automatically change every 3 seconds.

3. Press any key except LIT to stop test sound mode.

Special Features

USING THE DELAY FUNCTION

Note: Delay is automatically set as the default for each channel when you turn on the scanner.

Many conversations might have a pause of several seconds between a query and a reply. To avoid missing a reply, you can program a 2-second delay into any of your scanner's channels. Then, when the scanner stops on the channel, D appears and the scanner continues to monitor the channel for 2 seconds after the transmission stops before it resumes scanning or searching.

To turn delay on or off, press FUNC then • /DELAY.

LOCKING OUT CHANNELS OR FREQUENCIES

You can scan existing channels or search frequencies faster by locking out channels or frequencies that have a continuous transmission, such as a weather channel.

Locking Out Channels

To lock out a channel while scanning, press L/OUT when the scanner stops on the channel. To lock out a channel manually, select the channel then press L/OUT until L appears.

Notes:
• You can still manually select locked-out channels.

To remove the lockout from a channel, manually select the channel and press L/OUT until L disappears.

Reviewing the Lock-Out Channels

To review all channels that are locked out, press MANUAL, then repeatedly press FUNC then L/OUT to view each locked-out channel. When you finish reviewing locked-out channels, press MANUAL.

Locking Out Frequencies

To lock out a frequency during a search, press L/OUT when the scanner stops on the frequency. The scanner locks out the frequency, then continues searching.

Notes:
• The scanner does not store locked out frequencies during a search.
• You can lock out as many as 50 frequencies in each bank. If you try to lock out more, Memory full! appears.
• If you lock out all frequencies in one search bank and only this search bank is activated, Search up... All ranges locked out! appears and the scanner does not search.

Reviewing Locked-Out Frequencies

Follow these steps to review the frequencies within a search bank that you locked out.

1. Press SEARCH to set search mode.

2. Press FUNC then L/OUT in search. The locked-out frequency and Lockout list appear. The locked-out number and the total locked-out number also appear as L/O XX of YY. If the search bank has no locked-out frequencies, Empty. Lockout list appears. Press FUNC then L/OUT again to cancel reviewing locked-out frequencies.

Add illust

Clearing a Locked-Out Frequency

To clear a locked-out frequency, select that frequency in order to use the locked-out frequencies review function, then press CL.

The frequency is unlocked and Unlocked appears for about 2 seconds. Then the next locked-out frequency appears. If all locked out frequencies are cleared within a bank, L/O list is empty. appears.

Clearing All Lock Out Frequencies in a Search Bank

1. Press SEARCH.

2. Turn on only one search bank, the one in which you want to clear all locked-out frequencies.

3. Press FUNC then 6. Confirm list clear? 1=YES Press other key for NO. appears. Press 1 to clear all lock-out frequencies and List cleared appears for about 2 seconds. Press any key other than 1, to cancel clear.

Note: You cannot clear all lock-out frequencies if all frequencies in the selected bank are locked out.

PRIORITY

With the priority feature, you can scan through programmed channels and still not miss an important or interesting call on a specific channel. When priority is turned on, the scanner checks that channel every 2 seconds, and stays on the channel if there is activity until the activity stops.

There is one priority channel separated to 300 channels memory frequency.

Notes:
• The priority feature does not operate while the scanner receives trunking frequencies.
• If you program a weather channel as the priority channel, the scanner stays in the priority channel only when the scanner detects the weather alert tone.

Follow these steps to program a channel as the priority channel.

1. Press MANUAL.

2. Use the number keys to enter the channel number you want to program as the priority channel. Then press MNUAL again.

3. Press FUNC then PRI. PRI Channel blinks at the bottom line.

4. Press ENTER.

Note: This scanner cannot set a channel as the priority channel if the channel's receive mode is MO or ED.

Follow those steps to program a weather channel as the priority channel.

1. Press WX.

2. Select the weather channel you want to program as the priority channel.

3. Press FUNC then PRI. Pri Channel appears at the bottom line.

To turn the priority function, press PRI to show P at the top line and PRIon appears at the bottom line while scanning. When stops scan at the priority channel it shows Pri Channel for 3 seconds and it is changed to Weather Alert and sounds alert.

Notes:
• Priority WX is only for receiving a weather alert.
• When the scanner detects a 1050 Hz alert tone, priority WX activates and you receive a weather alert.
• To turn off the priority feature, press P disappears.

Notes:
• If you program a weather frequency into the priority channel and the scanner detects a weather alert tone on that frequency, the scanner sounds the alert tone.

CHANGING THE RECEIVE MODE

The scanner is preset to the most common AM or FM receive mode for each frequency range. The preset mode is corrected in most cases. However, some amateur radio transmissions and trunked systems do not operate in the preset mode. If you try to listen to a transmission when the scanner is not set to the correct receive mode, the transmission might sound weak or distorted.

If you want to listen to trunking transmissions in closed mode, you might have to change the receive mode.

To change the receive mode, repeatedly press MODE. The receive mode changes as follows:

Display	Description
AM	AM Mode
FM	FM Mode
MO	FM Mode, Motorola Trunking System (with a 4- or 5-digit ID code)
ED	FM Mode, EDACS Trunking System (with 4-digit decimal ID code or 5-digit AFS code)

USING THE ATTENUATOR

To reduce interference or noise caused by strong signals, you can reduce the scanner's sensitivity to these signals.

There are two function of attenuator in your PRO-93.
One is normal attenuator set to each the channel and each band in the Search and Tune mode. The other is set attenuator global unit.

Press ATT to turn on or off the channel attenuator while channel number is indicated.

Turn on the channel attenuator then "A" is indicated at the 7th digit in the top line.
When turn it off the indication is changed to ".".
Attenuator is not able to set while Scanning.

Press FUNC then ATT to set the attenuator to the global unit. When set global attenuator "Global ATT." is indicated for 2 seconds at the bottom line and "a" or "-" is indicated instead of "A" channel attenuator indication. To press ATT key to turn on or off the global attenuator.
""ATTon" or "ATT-" is indicated at the bottom line while scan.

Press FUNC then ATT while global attenuator to change it to normal and "Normal ATT." is indicated at the bottom line for 2 seconds.

Note: If you turn on this feature, the scanner might not receive weak signals.

USING THE DISPLAY BACKLIGHT

You can turn on the display's backlight for easy viewing in dimly lit areas. Press LIT to turn on the display light for 5 seconds. To turn off the light before it automatically turns off, press LIT again.
Press LIT for more that 1 second the backlight is continually turn on. Press LIT while turn on the light to turn off it.
You can select turn on time. Press FUNC then 8 in manual mode. Press up or down key to select 3, 5, 10 or 20 seconds period and press ENTER.

TURNING THE KEY TONE ON AND OFF

Each time you press any of the scanner's keys, the scanner sounds a tone. Follow these steps to turn the scanner's key tone off or on.

1. If the scanner is on, turn VOLUME OFF/MAX counterclockwise until it clicks to turn the scanner off.

2. Turn VOLUME OFF/MAX clockwise to turn the scanner on. Welcome To Dual Trunking appears.

3. While Welcome To Dual Trunking appears, press 1 to turn on the key tone or 2 to turn it off.

USING THE KEYLOCK

Once you program your scanner, you can protect it from accidental program changes by turning on the key lock feature. When the keypad is locked, the only controls that operate are FUNC, (Light Symbol)/(KeySymbol), SQUELCH, and VOLUME.

Note: You cannot activate the key lock when in the middle of programming.

To turn on the key lock, press FUNC then (Light Symbol)/(KeySymbol) Key locked. appears for about 1 second. Key locked. appears when you press any key after locking the keypad.

To turn off the key lock, press FUNC then (Light Symbol)/(KeySymbol). The scanner beeps once and Key

unlocked appears about 1 second.

CHANGING THE DISPLAY CONTRAST

1. Press MANUAL.

2. Press FUNC then 9. Use Up/Down keys to set contrast. appears.

3. Press /¥ or ¥/ to select the contrast.

4. Press ENTER to set the display contrast.

CLONING THE PROGRAMMED DATA FROM SCANNER TO SCANNER

You can transfer the programmed data to and from another RadioShack Cat. No. 20-523 or 20-466 scanner using the clone cable. We recommend RadioShack Cat. No. 42-2487 for the cable. To clone the data, follow these steps.

1. Turn on both scanners.

2. Connect the supplied clone cable to each scanner's PC/IF jack. *CLONE MODE* UP to send, remove cable to exit appears.

3. Press /¥. Confirm send data? 1=Yes Press other key for No. appears.

4. Press 1 to send the data to the other unit or press any other key to cancel the operation.

The scanner sends the data. To exit the clone mode, remove the cable.

Trunking Operation

The scanner tracks transmissions that use the Motorola® Type I and Type II (such as Smartnet and Privacy Plus) and hybrid analog trunking systems, plus GE/Ericsson (EDACS) type systems, which are extensively used in many communication systems.

Trunking systems allocate a few frequencies to many different users. When the mobile unit transmits a signal, one frequency is chosen from among the allocated frequencies in that trunking system. The user's ID talk group is sent with the signal.

To receive trunking signals, you must store all the trunking group frequencies in one bank (see "Storing Known Frequencies into Channels" on Page XX) and input ID codes in the ID memory (see "Storing Talk Group IDs" on Page XX).
Important : To listen to the transmission, the mode of the programmed channel must be the same as that of the trunking channel (MO, or ED).

When an ID code is received, the ID list for the bank is searched, and if found, the text name stored for the ID appears. If not found, scanning resumes immediately unless the bank is in open trunking mode.

Note: There might be more than one talk group transmitting at a time in some Motorola trunking systems. If you set the scanner to manually tune in Motorola trunking mode, you will hear the talk group on that channel, but the display will alternate between all active IDs.

Trunking group frequencies are included in the supplied Police Call Trunking Guide. Frequency fleet map and talk group information is also widely available on the Internet, at www.trunkscanner.com for example.

UNDERSTANDING TRUNKING

In the past, groups that transmit frequently, such as police departments, could transmit on only a few frequencies. This resulted in heavy traffic and often required 2-way radio users to wait for a specific frequency to clear before transmitting. Trunked systems allow more groups of 2-way radio users to use fewer frequencies. Instead of selecting a specific frequency to transmit on, a trunked system chooses one of several frequencies when the 2-way radio user transmits. The system automatically transmits the call on that frequency, and also sends a code that identifies that 2-way radio user's transmission on a control channel.

This scanner lets you easily hear both the call and response transmissions for that 2-way radio user and therefore follow the conversation. For EDACS and Motorola (above 406 MHz range), the scanner monitors the control channel between each transmission to identify talk groups.

SETTING SQUELCH FOR THE TRUNKING MODE

Your scanner automatically mutes the audio during trunk scanning when it decodes control channel data. However, we recommend you turn SQUELCH clockwise and leave it set to a point just after the hissing sound stops. This lets the scanner quickly acquire the data channel.

PROGRAMMING TRUNKING FREQUENCIES

You program trunking frequencies just like non-trunked frequencies, except that you must store the appropriate mode (MO or ED) with each frequency.

Notes:
• You can store only one trunked EDACS and Motorola channel in a bank. You can, however, mix conventional channels in a bank.
• If you are programming trunked frequencies for Motorola Type I and hybrid systems, you must first program the fleet map (see "Programming Fleet Maps" on Page XX).

Follow these steps to program trunked frequencies.

1. Press PGM and select the bank, then press TRUNK to enter the ID program mode.

2. Repeatedly press MODE to select MO for Motorola, or ED for the EDACS (GE/Ericsson) system to scan. This sets the talk group ID decoding method to be used for the bank.

Notes:
• If you select Non instead of MO, or ED, the scanner does not scan trunked frequencies.
Instead, you see:

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• If you programmed a Motorola Type I or Hybrid system, see "Programming Fleet Maps" on Page XX.

3. Press PGM to enter the program mode.

4. Store the trunking frequencies into subsequent channels in the same bank (see "Storing Known Frequencies into Channels" on Page XX).

5. Repeatedly press MODE to select the trunking mode — MO for Motorola, or ED for the EDACS (GE/Ericsson) system.

Programming Motorola Trunking Systems (UHF-Lo)

You can program the scanner to receive transmissions in the UHF-Lo band (406–512 MHz) of the Motorola trunking system. You can receive these transmissions by:

• Checking the trunking system's control channel. You must program the system's base frequency and offset frequency to do this.

Notes:
• Base and offset frequencies vary for each type of trunking system. You can get information about these frequencies for the trunking system you want to scan using www.trunkscanner.com, other Internet sources, or locally-published guidebooks.
• If you try to enter an offset frequency in the VHF and UHF-Hi bands (under 174 and 806–960 MHz), the scanner will ignore the entry.

Follow these steps to program Motorola trunking frequencies in the UHF-Lo band.

1. Press PGM then TRUNK to ID program mode.

2. Press MODE and select MO.

3. Press FUNC then 2.
   LCD indicates Base freq.: at the 1st line, 413.0000 at the 2nd line, Offset : 380 at 3rd line and Step : 25.0kHz at bottom line.

4. While blinks B in Base, if necessary press your desired Base frequency with number key and press ENTER. Make sure the entry and if it is incorrect then press number key again to set the base frequency. After you make sure the input then press ENTER again.

5. While blinks O in the Offset, if necessary press offset number and press ENTER. Make sure the entry and if it is incorrect then press number key again to set the base frequency. After you make sure the input then press ENTER again.

6. While blink S in the Step press /¥ and ¥/ to repeat step number indication from 25.0, 50.0 and 12.5 kHz. Press ENTER.

7. Press PGM to enter the program mode.

Store the trunking IDs into the sub-bank in the same bank.

PROGRAMMING FLEET MAPS

You must set the fleet map if you want to receive a Motorola Type I system. Fleet maps are included along with other information about Motorola Type I systems at www.trunkscanner.com.

Follow these steps to program a fleet map.

1. Press PGM then TRUNK.

2. For each bank you want to program, repeatedly press FUNC, /¥, or ¥/ to select the bank.

3. Press FUNC.

4. Press 8. The following display appears:

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5. Enter the size code supplied with the Type I system information, referring to the instruction that appears on the display. If the information was not supplied, try the following common fleet maps.

Block	Size Code							
	1	2	3	4	5	6	7	8
0	S11	S4	S4	S12	S4	S3	S10	S1
1	S11	S4	S4	-	S4	S10	S10	S1
2	S11	S4	S4	S4	S12	S4	S11	S2
3	S11	S4	S4	S4	-	S4	S4	S2
4	S11	S4	S4	S4	S4	S12	S4	S3
5	S11	S4	S4	S4	S4	-	S4	S3
6	S11	S4	S12	S4	S4	S12	S4	S4
7	S11	S4	-	S4	S4	-	S4	S4

Block	Size Code							
	9	10	11	12	13	14	15	16
0	S4	S0	S4	S0	S3	S4	S4	S3

1	S4	S0	S0	S0	S3	S3	S4	S10
2	S0	S0	S0	S0	S11	S10	S4	S10
3	S0	S0	S0	S0	S4	S4	S11	S11
4	S0	S0	S0	S0	S4	S4	S11	S0
5	S0	S0	S0	S0	S0	S4	S0	S0
6	S0	S4	S0	S0	S0	S12	S12	S12
7	S0	S4	S0	S4	S0	-	-	-

6. Press ENTER for each entry. If you make a mistake, press CL and enter the correct size code.

Note: The default setting of the bank is for Motorola Type II. However, if you set Type I and you want to return to Type II, enter 15 at Step 5.

7. To confirm the input, repeat Steps 1–5 and press ENTER. Each time you press ENTER, you confirm the size code. If you find an error, press CL and begin again at Step 1.

8. Press SCAN to start scanning.

TALK GROUP IDS

There are 10 talk group ID banks and each ID bank has 5 sub-banks and each sub-bank has 20 ID locations. You can program up to 100 talk group IDs in each bank, so you can program up to 1,000 talk group IDs in 10 banks. When the scanner stops on a transmission in the Motorola, or EDACS mode, it checks to see if the ID has been stored. In the closed mode, the scanner only stops on the transmission and displays its text tag if you have stored and not locked out the ID. In the open mode, the scanner always stops on a transmission, but it displays the ID's text tag if you have stored the ID.

Storing Talk Group IDs

To store a talk group ID when scanning, press TRUNK when the scanner stops on a transmission. The bottom line changes to ID#XXXX, indicating that the ID is stored.

Note: When you try to store more than 100 talk group IDs in a bank, Memory full! appears. Clear some talk group IDs in order to store new ones (see "Clearing Talk Group IDs" on Page XX).

Follow these steps to manually store talk group IDs or to edit a stored ID.

1. Press PGM.

2. Press TRUNK.

3. To select the bank where you want to store the ID, press FUNC then /¥ or ¥/.

4. Press MODE to select MO or ED.

5. Enter the talk group ID and press ENTER. If necessary, use the decimal point for a hyphen.

Notes:
• If you made a mistake in Step 4, Invalid ID. appears and the scanner beeps when you press ENTER. Start again at Step 3.
• You can enter either decimal or AFS code for ED ID. The default setting is decimal ID entry. When you press FUNC then 2, AFS format appears for about 2 seconds. Now you can enter the ID code with AFS format.

6. Press TEXT and enter the text tag for the ID, then press ENTER.
Invalid appears when you enter the incorrect ID code.

7. To store the next ID memory in sequence, press /¥ and repeat Steps 4 and 5 to enter more IDs.

8. Press SCAN to start scanning.

Talk Group ID Hold

You can set your scanner to follow a trunking signal that you want to track during scanning. Hold down TRUNK for more than 2 seconds. ID hold ON. appears.

Add illust

To release ID hold, press SCAN or TRUNK.

Locking Out Talk Group IDs

Note: You can only lock out talk group IDs when the scanner is in the closed mode (see "Open and Closed Modes" on Page XX).

1. Press PGM.

2. Press TRUNK.

3. Press FUNC, /¥ or ¥/ to move the desired bank.

4. Press /¥ or ¥/ to select the ID memory.

5. Press L/OUT to lock out the ID. L appears.

6. To remove the lockout from a trunking ID, manually select the ID memory, and press L/OUT until L disappears.

Delay function in ID indication mode.
Press FUNC then ./Delay key.
LCD indicates Use up/Down at the 1st line,
Keys to set at the 2nd line

ID delay. At 3rd line and
2.0 seconds at bottom line.

Press up or down to select None, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5 or 4.0 seconds.
Press ENTER.

Reviewing Locked-Out Talk Group IDs

Note: You cannot clear all lockouts from a talk group at the same time.

1. Press PGM then TRUNK.

2. Press FUNC then L/OUT. The locked out ID appears. If the ID memory bank has no locked out ID, you hear the low beep tone.

3. Press FUNC then /¥ or ¥/ to select a search bank. Or, just press /¥ or ¥/ to search for any locked out IDs in a bank.

Clearing Talk Group Ids

1. Press PGM then TRUNK.

2. Press FUNC, /¥ or ¥/ to select ID memory.

3. Press FUNC then CL.

Clearing All Talk Group IDs in One Bank

You can clear all talk group IDs within a bank. This lets you quickly delete all talk group IDs from a bank (for example, if you want to use the bank to store a different set of talk group IDs).

1. Press PGM.

2. Press TRUNK to enter a talk group ID memory mode.

3. Select a talk group ID bank using FUNC, /¥ or ¥/.

4. Press FUNC then 6. Confirm list clear ? 1=YES Press other key for NO. appears.

5. Press 1 to clear the all talk group IDs within a bank. Please Wait then List Cleared appears.

Note: To cancel the deletion, press any key except 1. The scanner returns to the talk group ID memory mode.

OPEN AND CLOSED MODES

When set to the open mode, the scanner only uses the ID list to look up ID text tags and stops on any ID code.

When set to the closed mode, the scanner stops only on signals that have an ID code which is found in the ID list for the bank.

Note: When you select a channel manually, any transmission opens squelch, regardless of the current mode.

Add illust

The open or closed mode is set in each channel storage bank. + or – appears under the channel storage bank's number while scanning. Or, the status display shows the OPEN/CLOSED mode at the top line while the scanner is in manual mode or receiving a signal during scanning.

When no ID code is programmed into the scanner, it receives the signal in MOT or ED mode.

Mode	Open	Closed
MOT/ED	Stops on any transmission. If the ID is stored, displays the text tag. Otherwise, displays the talk group ID.	Only stops on a transmission if the ID is stored. Displays the text tag.

Changing the Open/Closed Mode

1. Press MANUAL.

2. Press FUNC then /¥ or ¥/ to select the channel storage bank.

3. Press FUNC then 5. Bank OPEN or Bank CLOSED appears. After that message disappears, the 10th digit on the top line of the display changes from + to – or vice versa.

4. Repeat Steps 2–3 for each bank.

A General Guide to Scanning

Reception of the frequencies covered by your scanner is mainly "line-of-sight." That means you usually cannot hear stations that are beyond the horizon.

GUIDE TO FREQUENCIES

US Weather Frequencies in MHz

162.400	162.425	162.450	162.475
162.500	162.525	162.550	

Ham Radio Frequencies

Ham radio operators often transmit emergency information when other means of communication break down. The chart below shows the frequencies the scanner receives that ham radio operators normally use:

Wavelength	Frequencies (MHz)
10-Meter	28.000-29.700
6-Meter	50.000-54.000
2-Meter	144.000-148.000
70-cm	420.000-450.000
33-cm	902.000-928.000
25-cm	1240.000-1300.000

Birdie Frequencies

Every scanner has birdie frequencies. Birdies are signals created inside the scanner's receiver. These operating frequencies might interfere with transmissions on the same frequencies. If you program one of these frequencies, you hear only noise on that frequency. If the interference is not severe, you might be able to turn SQUELCH clockwise to cut out the birdie.

This scanner's birdie frequencies (in MHz) are:

Will add

To find the birdies in your scanner, begin by disconnecting the antenna and moving it away from the scanner. Make sure that no other nearby radio or TV sets are turned on near the scanner. Use the search function and scan every frequency range from its lowest frequency to the highest. Occasionally, the searching will stop as if it had found a signal, often without any sound. This is a birdie. Make a list of all the birdies in your scanner for future reference.

GUIDE TO THE ACTION BANDS

Typical Band Usage

HF Band

HF Range	25.000-26.960 MHz
Citizen's Band	26.965-27.405 MHz
10-Meter Amateur	28.000-29.700 MHz

VHF Band

Low Range	29.700-50.000 MHz
6-Meter Amateur	50.000-54.000 MHz
U.S. Government	137.000-144.000 MHz
2-Meter Amateur	144.000-148.000 MHz
High Range	148.000-174.000 MHz
New Mobile Narrow Band	220.000-222.000 MHz
1 1/4-Meter Amateur	222.000-225.000 MHz

UHF Band

U.S. Government	406.000-420.000 MHz
70-cm Amateur	420.000-450.000 MHz
Low Range	450.000-470.000 MHz
FM-TV Audio Broadcast, Wide Band	470.000-512.000 MHz
800 band Law Enforcement	806.000-824.000 MHz
Conventional Systems	851.000-856.000 MHz
Conventional/Trunked Systems	856.000-861.000 MHz
Public Safety	866.000-869.000 MHz
Trunked Private/General	894.000-960.000 MHz
25-cm Amateur	1240.000-1300.000 MHz

Primary Usage

As a general rule, most of the radio activity is concentrated on the following frequencies:

VHF Band

Activities	Frequencies
Government, Police, and Fire	153.785-155.980 MHz
Emergency Services	158.730-159.460 MHz
Railroad	160.000-161.900 MHz
Land-Mobile "Paired" Frequencies	220.000-222.000 MHz

UHF Band

Activities	Frequencies
Land-Mobile "Paired" Frequencies	450.000-470.000 MHz
Base Stations	451.025-454.950 MHz
Mobile Units	456.025-459.950 MHz
Repeater Units	460.025-464.975 MHz
Control Stations	465.025-469.975 MHz

Note: Remote control stations and mobile units operate at 5 MHz higher than their associated base stations and relay repeater units.

BAND ALLOCATION

To help decide which frequency ranges to scan, use the following listing of the typical services that use the frequencies your scanner receives. These frequencies are subject to change, and might vary from area to area. For a more complete listing, refer to Police Call Radio Guide including Fire and Emergency Services, available at your local RadioShack store.

Abbreviations Services

AIR . . . . . Aircraft
BIFC . . . . . Boise (ID) Interagency Fire Cache
BUS. . . . . Business
CAP. . . . . Civil Air Patrol
CCA. . . . . Common Carrier
CB. . . . . .Citizens Band
CSB. . . . . Conventional Systems
CTSB. . . . . Conventional/Trunked Systems
FIRE . . . . . Fire Department
HAM . . . . . Amateur (Ham) Radio
GOVT . . . . . Federal Government
GMR . . . . . General Mobile Radio
GTR. . . . . General Trunked
IND . . . . . Industrial Services
(Manufacturing, Construction, Farming and Forest Products)
MAR . . . . . Military Amateur Radio
MARI . . . . . Maritime Limited Coast
(Coast Guard, Marine Telephone,)
Shipboard Radio and Private Stations)
MARS . . . . . Military Affiliate Radio System
MED . . . . . Emergency/Medical Services
MIL . . . . . U.S. Military
MOV . . . . . Motion Picture/Video Industry
NEW . . . . . New Mobile Narrow
NEWS . . . . . Relay Press (Newspaper Reporters)
OIL. . . . . Oil/Petroleum Industry
POL . . . . . Police Department
PUB. . . . . Public Services
(Public Safety, Local Government and Forestry Conservation)
PSB . . . . . Public Safety
PTR . . . . . Private Trunked
ROAD . . . . . Road & Highway Maintenance
RTV . . . . . Radio/TV Remote Broadcast Pickup
TAXI. . . . . Taxi Services
TELB . . . . . Mobile Telephone
TELM. . . . . Telephone Maintenance
TOW . . . . . Tow Trucks

TRAN. . . . . Transportation Services
(Trucks, Tow Trucks, Buses, Railroad, Other)
TSB . . . . . Trunked Systems
TVn . . . . . FM-TV Audio Broadcast
USXX. . . . . Government Classified
UTIL. . . . . Power & Water Utilities
WTHR . . . . . Weather

HIGH FREQUENCY (HF)
High Band—(25.00-27.63 MHz—in 5 or 10 kHz steps))
25.020-25.320. . . . . .IND
25.870-26.470. . . . . .RTV
26.62. . . . . .CAP
26.965-27.405. . . . . CB
27.430-27.630. . . . . .BUS

10-Meter Amateur Band—(in 5 kHz steps)
28.000–29.700 . . . . . HAM

VERY HIGH FREQUENCY (VHF)
VHF Low Band—(29–50 MHz—in 5 kHz steps)
29.900–30.550 . . . . . .GOVT, MIL
30.580–31.980 . . . . . IND, PUB
32.000–32.990 . . . . . .GOVT, MIL
33.020–33.980 . . . . . BUS, IND, PUB
34.010–34.990 . . . . . .GOVT, MIL
35.020–35.980 . . . . . BUS, PUB, IND, TELM
36.000–36.230 . . . . . .GOVT, MIL
36.250 . . . . . Oil Spill Cleanup
36.270–36.990 . . . . . .GOVT, MIL
37.020–37.980 . . . . . PUB, IND
38.000–39.000 . . . . . .GOVT, MIL
39.020–39.980 . . . . . PUB
40.000–42.000 . . . . . GOVT, MIL, MARI
42.020–42.940 . . . . . POL
42.960–43.180 . . . . . IND
43.220–43.680 . . . . . TELM, IND, PUB
43.700–44.600 . . . . . TRAN
44.620–46.580 . . . . . POL, PUB
46.600–46.990 . . . . . GOVT
47.020–47.400 . . . . . PUB
47.420 . . . . . American Red Cross
47.440–49.580 . . . . . IND, PUB
49.610–49.990 . . . . . .MIL

6-Meter Amateur Band—(50–54 MHz—in 5 kHz steps))

50.000–54.000 . . . . . .HAM

Aircraft Band—(108–137 MHz—in 12.5 kHz steps)
108.00–121.490 . . . . . .AIR
121.500 . . . . . AIR Emergency
121.510–136.975 . . . . . AIR

U.S. Government Band (137–144 MHz—in 5 kHz steps))
137.000–144.000 . . . . . .GOVT, MIL

2-Meter Amateur Band (144–148 MHz—in 5 kHz steps)
144.000–148.000 . . . . . .HAM

VHF High Band (148–174 MHz—in 5, 6.25 or 7.5 kHz steps)
148.050–150.345 . . . . . CAP, MAR, MIL
150.775–150.790 . . . . . .MED
150.815–150.980 . . . . . TOW, Oil Spill Cleanup
150.995–151.475 . . . . . ROAD, POL
151.490–151.955 . . . . . IND, BUS
151.985 . . . . . TELM
152.0075 . . . . . .MED
152.030–152.240 . . . . . TELB
152.270–152.480 . . . . . IND, TAXI, BUS
152.510–152.840 . . . . . TELB
152.870–153.020 . . . . . IND, MOV
153.035–153.725 . . . . . .IND, OIL, UTIL
153.740–154.445 . . . . . PUB, FIRE
154.490–154.570 . . . . . IND, BUS
154.585 . . . . . Oil Spill Cleanup
154.600–154.625 . . . . . BUS
154.655–156.240 . . . . . MED, ROAD, POL, PUB
156.255–157.425 . . . . . OIL, MARI
157.450 . . . . . .MED
157.470–157.515 . . . . . TOW
157.530–157.725 . . . . . .IND, TAXI
157.740 . . . . . BUS
157.770–158.100 . . . . . TELB
158.130–158.460 . . . . . BUS, IND, OIL, TELM, UTIL
158.490–158.700 . . . . . TELB
158.730–159.465 . . . . . POL, PUB, ROAD
159.480 . . . . . .OIL
159.495–161.565 . . . . . .TRAN
161.580–162.000 . . . . . .OIL, MARI, RTV
162.0125–162.350 . . . . . GOVT, MIL, USXX
162.400–162.550 . . . . . WTHR
162.5625–162.6375 . . . . . GOVT, MIL, USXX

162.6625 . . . . . .MED
162.6875–163.225 . . . . . GOVT, MIL, USXX
163.250 . . . . . .MED
163.275–166.225 . . . . . GOVT, MIL, USXX
166.250 . . . . . GOVT, RTV, FIRE
166.275–169.400 . . . . . .GOVT, BIFC
169.445–169.505 . . . . . Wireless Mikes, GOVT
169.550–169.9875 . . . . . GOVT, MIL, USXX
170.000–170.150 . . . . . BIFC, GOVT, RTV, FIRE
170.175–170.225 . . . . . GOVT
170.245–170.305 . . . . . Wireless Mikes
170.350–170.400 . . . . . .GOVT, MIL
170.425–170.450 . . . . . BIFC
170.475 . . . . . PUB
170.4875–173.175 . . . . . GOVT, PUB, Wireless Mikes
173.225–173.5375 . . . . . MOV, NEWS, UTIL, MIL
173.5625–173.5875 . . . . . MIL, Medical/Crash Crews
173.600–173.9875 . . . . . GOVT

New Mobile Narrow Band (220-222 MHz—in 5 kHz steps))
220.222-222.000. . . . . .NEW

1 1/4-Meter Amateur band (222.000-225.000 MHz—in 5 kHz steps)
222.000-225.000. . . . . .HAM

ULTRA HIGH FREQUENCY (UHF)
U. S. Government Band (406–420 MHz—in 6.25 kHz steps)
406.125–419.975 . . . . . GOVT, USXX

70-cm Amateur Band (420–450 MHz—in 6.25 kHz steps)
420.000–450.000 . . . . . .HAM

Low Band (450–470 MHz— in 6.25 kHz steps)
450.050–450.925 . . . . . RTV
451.025–452.025 . . . . . IND, OIL, TELM, UTIL
452.0375–453.00 . . . . . IND, TAXI, TRAN TOW, NEWS
453.0125–454.000 . . . . . PUB, OIL
454.025–454.975 . . . . . TELB
455.050–455.925 . . . . . RTV
457.525–457.600 . . . . . BUS
458.025–458.175 . . . . . .MED
460.0125–460.6375 . . . . . FIRE, POL, PUB
460.650–462.175 . . . . . BUS
462.1875–462.450 . . . . . BUS, IND
462.4625–462.525 . . . . . IND, OIL, TELM, UTIL
462.550–462.925 . . . . . GMR, BUS

462.9375–463.1875 . . . . . .MED
463.200–467.925 . . . . . BUS

FM-TV Audio Broadcast, UHF Wide Band (470–512 MHz— in 6.25 kHz steps)
(Channels 14 through 69 in 6 MHz steps)
475.750 . . . . . Channel 14
481.750 . . . . . Channel 15
487.750 . . . . . Channel 16
493.750 . . . . . .Channel 17
499.750 . . . . . .Channel 18
505.750 . . . . . Channel 19
511.750 . . . . . Channel 20
Note: Some cities use the 470–512 MHz band for land/mobile service.

Conventional Systems Band – Locally Assigned (in 6.25 kHz steps)
851.0125–855.9875 . . . . . CSB

Conventional/Trunked Systems Band – Locally Assigned (in 6.25 kHz steps)
856.0125–860.9875 . . . . . CTSB

Trunked Systems Band – Locally Assigned (in 6.25 kHz steps)
861.0125–865.9875 . . . . . TSB

Public Safety Band – Locally Assigned (in 6.25 kHz steps)
866.0125–868.9875 . . . . . PSB

33-Centimeter Amateur Band (902–928 MHz— in 6.25 kHz steps)
902.000–928.000 . . . . . .HAM

Private Trunked Band (in 6.25 kHz steps)
935.0125–939.9875 . . . . . PTR

General Trunked Band (in 6.25 kHz steps)
940.0125–940.9875 . . . . . GTR

23-Centimeter Amateur Band (in 6.25 kHz steps)
1240.000-1300.000 . . . . . HAM

FREQUENCY CONVERSION

The tuning location of a station can be expressed in frequency (kHz or MHz) or in wavelength (meters). The following information can help you make the necessary conversions.

1 MHz (million) = 1,000 kHz (thousand)

To convert MHz to kHz, multiply the number of megahertz by 1,000:

30.62 (MHz) x 1000 = 30,620 kHz

To convert from kHz to MHz, divide the number of kilohertz by 1,000:

127.800 (kHz) / 1000 = 127.8 MHz

To convert MHz to meters, divide 300 by the number of megahertz:

300/50 MHz = 6 meters

Troubleshooting

If you have problems with your scanner, here are some suggestions that might help you eliminate the problem. If they do not, take your scanner to your local RadoShack store for assistance.

Problem	Possible Cause	Remedy
Scanner is on but will not scan.	SQUELCH is not adjusted correctly.	Turn SQUELCH clockwise. See "Turning on the Scanner and Setting Squelch" on Page XX.
Poor or no reception.	An antenna is not connected or connected incorrectly.	Make sure an antenna is connected to the scanner.
	Programmed frequencies are the same as birdie frequencies.	Avoid programming birdie frequencies or only select them manually. See "Birdie Frequencies" on Page XX.
In the scan mode, the scanner locks on frequencies that have an unclear transmission.	Stored frequencies are the same as "birdie" frequencies.	Avoid storing birdie frequencies or only select them manually. See "Birdie Frequencies" on Page XX.
Scanner is totally inoperative.	No power.	Check the batteries or make sure the AC adapter or DC adapter is connected properly.
		Recharge the rechargeable batteries on replace the non-rechargeable batteries.

	The AC adapter or DC adapter is not connected.	Be sure the adapter's barrel plug is fully plugged into the PWR DC 9V jack.
	The batteries maybe improperly installed.	Make sure the batteries are properly installed according to polarity markings on the battery holder.
Keypad does not work.	Keylock is turned on.	Turn off keylock.
Keys do not work or display changes.	Undetermined error.	Turn the scanner off then on again, or reset the scanner. See "Resetting/Initializing the Scanner."

RESETTING/INITIALIZING THE SCANNER

If the scanner's display locks up or does not work properly after you connect a power source, you might need to reset or initialize it.

Important: If you have problems with the scanner, first try to reset it to retain all memory. If that does not work, you can initialize the scanner; however, initializing clears all information stored in the scanner's memory.

Resetting the Scanner.

1. Turn off the scanner, then turn it on again.

2. Insert a pointed object, such as a straightened paper clip, into the reset opening on the side of the scanner. Then gently press and release the reset button inside the opening and the backlight lights.

Add illust

Note: Pressing RESET does not clear the scanner's memory.

Initializing the Scanner

Important: This procedure clears all information you stored in the scanner's memory. Initialize the scanner only when you are sure the scanner is not working properly.

1. Turn off the scanner, then turn it on again. Welcome To Dual Trunking appears.

2. Press 0 then 1 while Welcome To Dual Trunking appears. Initializing Please Wait. appears for about 25 seconds

Note: Do not turn off the scanner until the initialization is complete and Welcome To Dual Trunking appears again.

Care

To enjoy your RadioShack Handheld Scanner for a long time:

. Keep the scanner dry. If it gets wet, wipe it dry immediately.

. Use and store the scanner only in normal temperature environments.

. Handle the scanner gently and carefully. Do not drop it.

. Keep the scanner away from dust and dirt.

. Wipe the scanner with a damp cloth occasionally to keep it looking new.

Modifying or tampering with the scanner's internal components can cause a malfunction and might invalidate its warranty and void your FCC authorization to operate it. If your scanner is not performing as it should, take it to your local RadoShack store for assistance.

Specifications

Frequency Coverage:

25-54 MHz (in 5 kHz steps)
108-136.9875 MHz (in 12.5 kHz steps)
137-174 MHz (in 5, 6.25 or 7.5 kHz steps)
406-512 MHz (in 6.25 kHz steps)
806-823.9875 MHz (in 6.25 kHz steps)
849-868.9875 MHz (in 6.25 kHz steps)
894-960 MHz (in 6.25 kHz steps)
1240-1300 MHz (in 6.25 kHz steps)

Memory channels	300
Channel memory Banks	10
Number of channel memory/bank	30
Talk group ID memories	1,000
ID memory Banks	10
Sub-banks	5
Number of ID memory/sub-bank	20

Sensitivity (20 dB S/N):
FM:

25-54 MHz	0.3 uV

108-136.9875 MHz	0.3 uV
137-174 MHz	0.5 uV
216-225 MHz	0.5 uV
406-512 MHz	0.5 uV
806-960 MHz	0.7 uV
1240-1300 MHz	2.0 uV

AM:

25-54 MHz	1 uV
108-136.9875 MHz	1 uV
137-174 MHz	1.5 uV
216-225 MHz	1.5 uV
406-512 MHz	2 uV
806-960 MHz	2 uV
1240-1300 MHz	2 uV

Selectivity:

25- 27.995 MHz AM mode

-6 dB	+/-5 kHz
-50 dB	+/-10 kHz

Other frequency AM and FM mode

-6 dB	+/-10 kHz
-50 dB	+/-18 kHz

Spurious Rejection (at 154 MHz FM)	40 dB
Scanning Rate	Up to 60 Channels per Second
Search Rate	Up to 60 Steps per Second
Delay Time	2 seconds

Intermediate Frequencies (IF):

1st	257.5 MHz
2nd	21.4 MHz
3rd	455 kHz

Priority Sampling	2 seconds
Operating Temperature	-14 to 140 F (-10 to 60 C)

IF Rejection

257.5 MHz at 154 MHz	60 dB
21.4 MHz at 154 MHz	100 dB

Squelch Sensitivity:

Threshold (FM and AM)	0.5 uV
Tight (FM)	25 dB
Tight (AM)	20 dB

Antenna Impedance	50 Ohms
Audio Output Power (10% THD)	240 mW
Built-in Speaker	1 3/8 Inches (36 mm) (8-ohm, Dynamic Type)

Power Requirements:

Batteries	4 AA Alkaline Batteries

	or 4 AA Rechargeable Ni-MH Batteries
External Power	9V DC
Current Drain (Squelched)	90 mA
Battery Charge Current	150 mA
Dimensions (HWD)	6 3/16 x 2 7/16 x 1 3/4 Inches (157 x 62 x 41 mm)
Weight (without antenna and batteries)	9.9 oz. (280 g)

Specifications are typical: individual units might vary. Specifications are subject to change and improvement without notice.

Warranty

Address & Date Code

Printed in China
GE-01D-9995