



PRO-96 Digital Trunking Scanner Catalog # 20-526

OWNER'S MANUAL —
Please read before using this equipment.

Thank you for purchasing the RadioShack PRO-96 Digital Handheld Scanner. This product is the first of an innovative and exciting new generation of RadioShack scanning receivers capable of receiving Phase 1 APCO-25 C4FM/IMBE digital voice modulation from the newest and most sophisticated conventional and trunked radio networks.

Your Radio Shack Digital Handheld Scanner is ready to receive digital conventional and trunked radio transmissions. No additional hardware or add-on cards are needed.



! IMPORTANT !

If an icon appears at the end of a paragraph, go to the box on that page with the corresponding icon for pertinent information.



— Warning



! — Important



— Caution



— Hint



— Note

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This device made under license under one or more of the following U.S. Patents: 4,590,473; 4,636,791; 5,148,482; 5,185,796; 5,271,017; 5,377,229

FEATURES

Your Radio Shack Digital Handheld Scanner features Intelligent Adaptive Digital Tracking for optimal reception of digital signals from a variety of digital conventional and trunked radio system types. No special sound quality settings or adjustments are needed for the different digital systems that you monitor.

APCO-25 digital voice modulation provides public safety radio users with clear digital voice signals and other features not available in traditional analog systems. Your scanner uses advanced Digital Signal Processing (DSP) technology to receive and decode APCO-25 digital signals from both conventional and trunked radio networks. Additionally, your scanner features automatic detection of digital signals. No special scanner programming is required to receive conventional or trunked digital traffic.

The DSP module in your scanner features updateable firmware. If DSP improvements become available, you can easily download an update file from the Internet and apply the file to your scanner to obtain the latest DSP firmware version.

Your scanner is designed to track Motorola analog and Astro® digital trunking systems using 3600 bps control channel operation, APCO 25 digital trunking systems using 9600 bps control channel

operation, and M/A-COM EDACS® trunking systems.

The scanner lets you scan conventional transmissions, and is preprogrammed with service search banks for your convenience. By pressing a single button, you can quickly search those frequencies most commonly used by public safety and other agencies.

Your RadioShack Digital Handheld Scanner features RadioShack's exciting new 11-in-1 V-Scanner technology. V-Scanner stands for Virtual Scanner. V-Scanner allows you to build and store eleven separate configuration profiles in V-Scanner folder memory. Stored V-Scanners can be recalled, edited and activated at any time, giving you a powerful tool that allows you to quickly reconfigure your scanner for use in different areas or applications.

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 the following features:

500 Channels – 10 channel storage banks with 50 channels each.

V-Scanner Folders – eleven 500 channel virtual scanner folders at your fingertips.

Phase 1 APCO-25 Digital

Reception – automatic detection and reception of digital voice modulation from conventional, trunked and mixed-mode networks.

Intelligent Adaptive Digital

Tracking – ensures optimal reception of digital signals from a variety of digital conventional and trunked radio system types.

Digital AGC – automatically compensates for audio level variances in digital transmissions.

Simultaneous Multi-System

Trunking Operation – quickly tracks up to ten Motorola, APCO-25 or EDACS trunking systems at the same time. Mix conventional channels and trunking systems in the same channel storage banks. Scan conventional frequencies and trunked systems simultaneously. Automatically detects Motorola 3600 bps or APCO-25 9600 bps control channel operation.

Automatic Channel Tracking – automatically determines the trunking system frequencies for Motorola and APCO-25 trunking systems, using only the active system control channel.

CTCSS and DCS Subaudible Encoded Squelch Modes

– restricts conventional channel reception to transmissions using specified subaudible CTCSS tone or DCS data code when scanning or parked on a single channel. Code Search feature instantly

displays the tone or code in use. Takes advantage of subaudible squelch tail elimination turn off codes when they are present.

10 ID List Banks – let you store 1500 IDs in 10 ID banks, each with 5 ID sub-banks. 30 IDs are available in each ID sub-bank. ID text tags let you easily identify the user of a particular talkgroup ID code.

Weather Priority Alert – while scanning, automatically sounds an 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 WX priority operation.

SAME/FIPS Weather Alert – displays the weather event text for the specific cities or counties you choose so you can see and hear the reason for the alert.

Data Cloning – lets you transfer the programmed data to another PRO-96 scanner. You can also upload or download the programmed data to or from a PC using an optional PC interface kit and application software.

12-Character, 4-Line, Alphanumeric Display – shows you detailed operating information clearly.

Triple Conversion Superheterodyne Receiver – virtually eliminates any interference from intermediate frequency (IF) images, so you

hear only the frequency you select.

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.

Hyperscan™ and Hypersearch™ – the scanner scans at up to 60 channels per second and searches up to 75 frequencies per second, to help you quickly find 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.

Adjustable Trunking Delay – waits for reply activity on a trunking call for the amount of time you specify.

Priority Channel — allows you to configure the scanner to check one channel every 2 seconds so you do not miss important transmissions.

Attenuator — allows you to set, by channel or globally, a 20 dB attenuator to reduce receiver overload and interference from nearby strong signals.

Text Input — lets you input a text label for each channel, talkgroup ID, channel storage bank, or other memory location so you can easily identify the transmission.

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 prevent accidentally changing the scanner's programming.

Battery Save Circuit — When monitoring a single frequency, allows the receiver to sleep in between receiver activity.

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, not supplied). You can also use an AC adapter (not supplied) or power the scanner in a vehicle using a DC adapter (not supplied).

Your scanner can receive these frequencies:

- 25 – 54 MHz
- 108 – 136.9875 MHz
- 137 – 174 MHz
- 216.0025 – 225 MHz
- 406 – 512 MHz

- 806 – 823.9875 MHz
- 849 – 868.9875 MHz
- 894 – 960 MHz
- 1240 – 1300 MHz

Use “A General Guide To Frequencies” on Page 96 to help you target frequency ranges in your service area so you can search for a wide variety of transmissions.

THE FCC WANTS YOU TO KNOW

This equipment has been tested and found to comply with the limits for a scanning receiver, pursuant to Part 15 of the *FCC Rules*.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

This device complies with Part 15 of the *FCC Rules*. Operation is subject to the following two conditions:

This device may not cause harmful interference.

This device must accept any interference received, including interference that may cause undesired operation.

SCANNING LEGALLY

Your scanner covers frequencies used by many different groups including police and fire departments, ambulance services, government agencies, private companies, amateur radio services, military operations, pager services, and wireline (telephone and telegraph) service providers. It is legal to listen to almost every transmission your scanner can receive. However, there are some transmissions you should never intentionally listen to. These include:

- Telephone conversations (cellular, cordless, or other private means of telephone signal transmission)
- Pager transmissions
- Any scrambled or encrypted transmissions

According to the Electronic Communications Privacy Act (ECPA), you are subject to fines and possible imprisonment for intentionally listening to, using, or divulging the contents of such a transmission unless you have the consent of a party to the communication (unless such activity is otherwise illegal).

This scanner has been designed to prevent reception of illegal transmissions. This is done to comply with the legal requirement that scanners be manufactured so as to not be easily modifiable to pick up those transmissions. Do not open your scanner's case to make any modifications that could allow it to pick up transmissions that are illegal to monitor. Doing so could subject you to legal penalties.

In some areas, mobile use of this scanner is unlawful or requires a permit. Check the laws in your area. It is also illegal in many areas to interfere with the duties of public safety officials by traveling to the scene of an incident without authorization.

We encourage responsible, safe and legal scanner use.

GETTING FAMILIAR WITH YOUR SCANNER

Though you may be anxious to begin using your new scanner right away, we recommend that you take the time to read this

manual thoroughly so that you may fully understand the advanced features and capabilities of your PRO-96 scanning receiver.

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 which frequencies and trunking systems you want to receive, and then program the scanner to scan them.

A frequency is the receiving signal location (expressed in MHz). To find active frequencies, you can use frequency guides available from your local RadioShack store, frequency listings posted on the Internet, or the built in search function.

Your scanner's SEARCH banks contained preprogrammed frequencies in the scanner's memory (see "Searching a Preprogrammed Frequency Range" on Page 52 for the frequency list). You can even change the frequency range on one of the SEARCH banks (SR6) to customize your own search parameters.

Once you identify the frequencies you wish to monitor, you can store them into programmable memory locations called channels, which are grouped in channel storage banks. 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 stops and monitors the radio traffic on that channel until the transmission ends, then resumes scanning. For detailed programming instructions, see “Programming Your Scanner” on Page 30.

ABOUT THE KEYPAD

Here is a brief overview of your scanner's keys and their functions.

SCAN — scans through the programmed channels.

FUNC — lets you use various functions by pressing this key in combination with other keys. When using the **FUNC** key, press the **FUNC** key first, then release it, then quickly press the next key in the function key sequence.

MAN — stops scanning and lets you directly enter a channel number.

WX — scans through the seven preprogrammed weather channels.



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

PRI — sets and turns the priority function on or off.

TEXT — lets you input text.

PAUSE — pauses search or tune operation.

MODE — changes the receive mode (AM, FM, CT, DC, MO, ED).

 /  — turns on/off the display's backlight, or when used with **FUNC** locks/unlocks the keypad to prevent accidental entries.

TUNE — allows you input a frequency and tunes up or down automatically or manually with the ▲ or ▼ keys.

ATT — turns attenuation on to reduce the scanner's sensitivity and block extremely strong signals, or turns it off to increase sensitivity.

▲ or ▼ — selects the scan or search direction.

SRCH — lets you search the seven search banks.

L/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 — completes the entry of frequencies and text.

1 — enters a 1, or inputs characters 0 through 9 in text mode.

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 an 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 . - # _ @ + * & / , \$ % ! ^ () ? ' .

./DELAY — enters a decimal point (necessary when programming frequencies), space, or programs delay time for the selected channel/search bank, or hyphen (in trunking ID setting).

CLR — clears an incorrect entry.

UNDERSTANDING YOUR SCANNER'S MEMORY ORGANIZATION

V-Scanners

A V-Scanner folder contains a complete, stored configuration profile of your scanner's programming. Certain current scanner models allow the user to load, save and edit different scanner configurations using an interface cable, software and a personal computer. The PRO-96 V-Scanner feature extends this functionality by allowing you to store or recall up to eleven scanner configurations in V-Scanner folders on your scanner, without using a personal computer. You can use the V-

Scanner feature to build and store configurations for different areas or different scanner applications. Using the cloning feature it is possible to exchange scanner configurations with your friends without losing your existing data. V-Scanners also provide a way for you to easily back up your programmed data without connecting your scanner to a personal computer.

Each V-Scanner folder stores all channel storage banks, channels, trunking lds, search settings, and other parameters associated with the operation of the scanner.

CHANNEL STORAGE BANKS

A channel storage bank is a storage area for a group of channels. Channels are storage locations for frequencies. Whereas a channel can only contain one frequency, a channel storage bank can hold 50 channels.

To make it easier to identify and select the channels you want to listen to, your scanner divides the channels into 10 banks (0 to 9) of 50 (00 to 49) channels each, a total of 500 channels. You can use each channel-storage bank to group frequencies, such as those used by different public safety agencies and jurisdictions in your area. Channel storage banks can be easily enabled or disabled while scanning by pressing the number key that corresponds with the desired channel storage bank.

For example, a particular city might use four frequencies for police communications, and four frequencies for fire communications. You could program the police frequencies starting with 000 (the first channel in bank 0) and program the fire department frequencies starting with 100 (the first channel in bank 1). This gives you the ability to quickly select what you wish to monitor by activating or deactivating the appropriate channel storage bank. When looking at channel numbers, the first digit identifies the bank (0 to 9). The second and third digits identify the channel within the bank (00 to 49).

CHANNELS

Channels are storage locations for the actual frequencies you wish to monitor. Each channel can be configured with a radio frequency, the desired mode for that frequency, and settings to allow a short delay after a transmission or lock the channel out from scanning operation. A channel can contain a conventional, non-trunked frequency, or a frequency used in a trunking system.

SEARCH BANKS

Your scanner has six preprogrammed search banks configured to search various radio services, and one limit search bank that you can configure. You can set the lower and higher frequency limit in the limit search bank.💡

UNDERSTANDING YOUR SCANNER'S CHANNEL RECEIVE MODES

You can program each channel with any one of six receive modes (AM, FM/Digital, CTCSS, DCS, Motorola, and EDACS).

Each receive mode affects how your scanner operates when scanning and receiving transmissions. ↙

AM Mode (AM)

The AM mode sets the scanner to receive transmissions using amplitude modulation (AM), primarily used for aircraft, military, 27 MHz citizen's band, some amateur radio, and some government transmissions. (Refer to "Specifications" on Page 110 for a list of the frequencies covered.) When the scanner receives a transmission on a channel set to the AM mode, it always stops on the transmission.

FM/Digital Mode (FM)

The FM/Digital (FM) mode sets the scanner to receive transmissions using frequency modulation (FM) and APCO-25 digital modulation. FM is used for most public safety transmissions, as well as broadcast, business, and amateur radio transmissions. APCO-25 digital modulation is used in many newer conventional and trunked public safety radio systems. When the scanner receives a transmission on a channel set to the FM/Digital



HINT

For example, if you wanted to find active frequencies between a range of 150.1000 and 150.5000, you would put both of those frequencies in the limit search bank.



NOTES

- Trunked modes (ED and MOT) can only be selected for frequencies above 137 MHz.
- Your scanner's Closed Mode lets you hear transmissions from only those trunking talkgroups you specify. For more information, see "Open and Closed Mode Operation" on Page 87.

mode, it always stops on the transmission.

CTCSS Mode (CT)

CTCSS mode sets the scanner to receive transmissions using frequency modulation (FM) with Continuous Tone Coded Squelch System (CTCSS) subaudible tone codes. CTCSS allows multiple users to share a single radio frequency without hearing each other's transmissions. In your PRO-96 scanner, the CTCSS feature can be used to block the reception of transmissions on shared channel to only those that use the CTCSS tone that you have specified. CTCSS mode also features a Code Search setting that allows you to instantly display and store unknown codes into the channel memory. CTCSS tones can sometimes be heard as a low "hum" in the background of a voice transmission. Many systems that use CTCSS transmit a special "turn off code" at the end of each transmission. The turn off code causes a properly equipped receiver to mute before the transmission ends, eliminating the "squelch tail" burst of noise the commonly occurs when the signal is lost. CTCSS turn off code performance can be affected by weak signals.

DCS Mode (DC)

DCS mode sets the scanner to receive transmissions using frequency modulation (FM) with Digital Coded Squelch (DCS) subaudible data signaling. DCS is very similar to CTCSS, except that

a digital code is transmitted instead of an audio tone. Like CTCSS, DCS allows multiple users to share a single radio frequency without hearing each other's transmissions. In your PRO-96 scanner, the DCS feature can be used to block the reception of transmissions on a shared channel to only those that use the DCS tone that you have specified. DCS mode also features a Code Search setting that allows you to instantly display and store unknown codes into the channel memory. DCS data can sometimes be heard as a low "purring" sound in the background of a voice transmission. Some DCS systems transmit a special "turn off code" at the end of each transmission. The turn off code causes a properly equipped receiver to mute before the transmission ends, eliminating the "squelch tail" burst of noise the commonly occurs when the signal is lost. DCS turn off code performance is typically more immune to weak signals than CTCSS.

Motorola/APCO-25 Trunking Mode (MO)

You can set your scanner so it decodes the talkgroup IDs used with Motorola and APCO-25 trunking systems and follows talkgroup calls in the trunking system. This setting is called the Motorola mode.

Motorola systems are trunking systems used primarily by business and public safety

agencies to efficiently allocate a small number of frequencies (as few as three) 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 talkgroup. For example, a city's east side patrol officers might all be assigned to talkgroup 2160. One channel in the system is continuously transmitting data that identifies which talkgroups are active on which channel. In addition, this talkgroup 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 talkgroup ID data included with the transmission. In the Open Mode, the scanner stops on the transmission and displays the talkgroup ID on the bottom line of the display. In the Closed Mode, the scanner only stops on the transmission if the talkgroup ID matches a talkgroup ID that you have stored in the bank's talkgroup ID list and have not locked out.

Trunking systems covered by the Motorola mode come in four categories: Type I, Type II, Type I/II Hybrid and APCO-25. Each category displays and uses talkgroup 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.

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 and APCO-25 system talkgroups are identified by a 5-digit number. Valid Type II talkgroup IDs are divisible by 16, while APCO-25 talkgroups are not. Use care to ensure that you enter the correct Type II IDs into your scanner. Type I/II hybrid systems use both fleet-subfleet and 5-digit formats for talkgroup IDs.

EDACS Trunking Mode (ED)

You can set your scanner so it decodes the talkgroup IDs used with EDACS (GE/Ericsson/M/A-COM) trunking systems. This setting is called the EDACS mode.

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

EDACS frequencies are organized in a specific order. Each frequency is assigned a Logical Channel

NOTES

- 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.
- Tuning the scanner to an active control channel while in Motorola mode will display the Motorola System ID and the approximate control channel message decode success rate. This information can help you identify the Motorola trunking system that you are monitoring and the quality of the control channel signal.

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 talkgroup 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 talkgroup. In the Open Mode, the scanner then goes to the transmission and displays the talkgroup ID on the bottom line of the display. In the Closed Mode, the scanner only goes to transmissions with IDs that match talkgroup IDs you have stored in the bank's talkgroup ID list that are not locked out

PREPARATION

LISTENING SAFELY

To protect your hearing, follow these guidelines when you use headphones.

- Set the volume to zero before putting on headphones. With the headphones on, adjust the volume to a comfortable level.
- Avoid increasing the volume once you set it. Over time, your sensitivity to a volume level decreases, so volume levels that do not cause

discomfort might damage your hearing.


- Avoid or limit listening at high volume levels. Prolonged exposure to high volume levels can cause permanent hearing loss.

TRAFFIC SAFETY

Wearing headphones while operating a motor vehicle or riding a bicycle can create a traffic hazard and is illegal in most areas.

Even though some headphones let you hear some outside sounds when listening at normal volume levels, they still can present a traffic hazard. Exercise extreme caution!

POWER SOURCES

You can power your scanner from any of these sources: 

- Internal non-rechargeable batteries or rechargeable batteries (not supplied – see “Using Batteries” on Page 25).
- Standard AC power (with an optional AC adapter – see “Using AC Power” on Page 27).
- Vehicle power (with an optional DC adapter – see “Using Vehicle Battery Power” on Page 28).

USING BATTERIES

You can power the scanner with four AA batteries (not supplied).

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 yellow rechargeable battery holder.
- If you install the yellow rechargeable battery holder, you can operate the scanner and recharge the rechargeable batteries at the same time. See “Using Batteries” on Page 25, and “Charging Rechargeable Batteries” on Page 27.
- If the scanner stops working properly after connecting it to power, try resetting it. See “Resetting / Initializing the Scanner” on Page 108.
- You must charge rechargeable batteries before you use them the first time.

⚠ 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.

📄 NOTES 📄

- Dispose of old batteries promptly and properly.
- Do not burn or bury batteries.
- Use only fresh batteries of the required size and recommended type.
- Do not mix old and new batteries, different types of batteries (standard, alkaline, or rechargeable), or rechargeable batteries of different capacities.
- If you do not plan to use the scanner for a month or longer, remove the batteries. Batteries can leak chemicals that can damage electronic parts.

⚡ CAUTION ⚡

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

You can use either the supplied non-rechargeable battery holder (black), or the supplied rechargeable battery holder (yellow). ⚠

Follow these steps to install the batteries. 📄

1. Press in on the top center of the battery compartment cover on the back of the scanner and slide the cover down to remove it.
2. Pull 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. ⚡

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

4. Place the battery holder into the battery compartment.
5. Replace the cover.

When battery power is low, **Low Battery!** is displayed and the scanner beeps once every 30 seconds. 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” on Page 27.

Charging Rechargeable Batteries

Your scanner has a built-in charging circuit that lets you charge nickel-metal hydride (Ni-MH) or nickel cadmium (Ni-CD) rechargeable batteries (not supplied) while they are in the scanner. To charge rechargeable batteries, connect an appropriate AC or DC adapter to the PWR DC 9V jack. For best results we recommend RadioShack rechargeable nickel-metal hydride (NiMH) 1800 mAh batteries.!

To charge batteries with a DC adapter from a DC power source, you must use a 9V, 300 mA DC adapter such as RadioShack Cat. No. 273-1810 and a size C Adaptaplug™ (neither supplied). Both are available at your local RadioShack store. Make sure the adapter's voltage is set to 9V.

It takes about 16 hours to recharge fully discharged 1800 mAh NiMH rechargeable batteries. You can operate the scanner while recharging the rechargeable batteries, but charging takes longer. ✓

USING AC POWER

You can power the scanner using a 9V, 300 mA AC adapter and a size C Adaptaplug™ (neither supplied). Both are available at your local RadioShack store.

! 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 our environment and conserving our natural resources.

NOTES


- The scanner can also charge Ni-Cd batteries. 600 mAh batteries require 6 hours and 850 mAh batteries require 8 hours to charge.
- When you charge Ni-Cd batteries, do not overcharge them. Overcharging shortens battery 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 in the scanner's display. Then fully charge the rechargeable batteries.

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.
- 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.

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 two-prong plug into an AC outlet.

USING VEHICLE BATTERY POWER

You can power the scanner from a vehicle's 12V power source (such as cigarette-lighter socket) using a 9V, 300 mA DC adapter and a size C Adaptaplug™ adapter (neither supplied). Both are available at your local RadioShack store. 

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 12V power source.

If the scanner does not operate properly when you connect a DC adapter, unplug the DC adapter from the power source and clean the socket, or check the adapter's internal fuse.

ANTENNA

Connecting the Supplied Antenna

To attach the supplied flexible antenna to the antenna jack on the

top of your scanner, align the slots around the antenna's connector with the studs on the antenna jack. Press the antenna down over the jack and turn the antenna's base clockwise until it locks into place.

Connecting an Optional External 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 RadioShack 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 length 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 (not supplied, 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 antenna jack.

Connecting an Earphone/Headphones

For private listening, you can plug an 1/8-inch (3.5 mm) mini-plug earphone or headphones (not supplied), available at your local RadioShack store, into the **HEADPHONE** jack on top of your scanner. This automatically disconnects the internal speaker.

⚠ 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, touching 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.

NOTES

Connecting an External Speaker

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

Storing Conventional Frequencies

- When the scanner is in Manual or Program mode, indicated with **M** or **P** in the top left hand corner of the display, you can select your desired bank and channel number using direct channel entry, the **▲** or **▼** arrow keys, and with **FUNC** and the **▲** or **▼** arrow keys.
- For direct channel entry, press **MAN** or **PGM**, enter the channel storage bank (0-9) and channel number (00-49) where you want to store a frequency, then press **MAN** or **PGM** again. For example, Bank 3, Channel 23 is entered as "323". The scanner advances to the selected channel storage bank and channel, and the channel storage bank and channel number appear at the upper left corner of the display (for example: **M323** or **P323**).
- Press **FUNC**, then **▲** or **▼** to jump to the next or previous channel storage bank.
- Press **FUNC**, then hold **▲** or **▼** to scroll through the channel storage banks.

Connecting an External 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** jack.

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.

PROGRAMMING YOUR SCANNER


PROGRAMMING CONVENTIONAL 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.

Storing Conventional Frequencies

Follow these steps to store conventional frequencies in to channels.

1. To begin programming your scanner, press **PGM**. **M** changes to **P**. Select the desired channel storage bank and channel, and press **PGM** to advance to that channel.

2. Use the number keys and **.DELAY** to enter the frequency (including the decimal point) you want to store.
3. If you make a mistake, press **CLR** to backspace and correct the incorrect digit, or press and hold **CLR** for about 2 seconds to clear the entire field and start over.
4. Press **ENTER** to store the frequency into the channel. 
5. By default, the scanner will configure the channels you enter for a two second delay after a transmission is received. This is indicated by the D character that appears in the top row of the display. If you do not want the scanner to pause for reply traffic before resuming scanning operation, press **.DELAY** until D is not visible in the top line of the display.
6. If necessary, press **MODE** to change the receiving mode. Valid modes for conventional frequencies include AM, FM/Digital, CTCSS and DCS. To program a specific code for CTCSS or DCS mode, press **FUNC MODE**, then enter the desired code followed by **ENTER**, or use the **▲** or **▼** keys to scroll to the desired code and press **ENTER** to store the code with the channel memory. For more information on CTCSS and DCS programming, see “Programming channels for

NOTES

- If you made a mistake in entering the frequency, **Invalid Freq** briefly appears and the scanner beeps when you press **ENTER**. Enter the frequency again.
- Your scanner automatically rounds the entered frequency to the nearest valid frequency. For example, if you enter a frequency of 151.53, your scanner accepts it as 151.5275. Reception of the frequency will not be adversely affected.
- If you enter a frequency that has already been entered elsewhere in the same bank, the scanner sounds an error tone and displays **Dupl.f** and the channel number that has been duplicated. If the dual entry is an error press **CLR** and enter the correct frequency. If the dual entry is intentional press **ENTER** to accept.
- You may replace any frequency by selecting the bank and channel, pressing **PGM** and entering the new frequency.
- You can clear programmed frequency data by pressing **FUNC**, then **CLR**.
- If you make an error in the entry process, press **CLR** as often as needed to erase the incorrect data, or press and hold **CLR** for one second to clear the entire field.

CTCSS and DCS operation” on Page 42.

7. If desired, program a text tag for the channel (see “Assigning a Text Tag to a Channel” on Page 45).

When you are ready to program additional channels, press **PGM** or **▲** to move up to the next channel memory location, or **▼** to move down.

PROGRAMMING TRUNKED SYSTEMS

This section of the manual provides instructions to program your scanner to receive trunked radio systems. If you are just getting started with trunked system monitoring or have any questions about how your PRO-96 scanner operates when tracking trunked radio systems. See “Trunking Special Features” on Page 83.

For best results, program only one trunking system in each channel storage bank of your scanner. Your scanner will lock on to the first active control channel it finds in a channel storage bank and follow the activity from that trunking system. 💡

Channel storage banks may contain both conventional, non-trunked channels, and control or system channels for a trunked system. The scanner will check for activity on the conventional channels after processing the trunking system.



HINT

Certain multi-zone Motorola systems use the same talkgroup IDs at multiple radio sites to cover a large geographical area. In these types of systems it may be possible to program multiple control channel frequencies into the same channel storage bank and allow the scanner to lock on to the different control channels as you move from zone to zone. ***This approach only works in networked systems where the same talkgroup IDs are used at multiple sites.*** It is not possible to program Motorola/APCO-25 and EDACS systems into the same channel storage bank.

PROGRAMMING MOTOROLA ANALOG, DIGITAL, AND APCO-25 TRUNKING SYSTEMS

1. Press **PGM** and **FUNC** then ▲ or ▼ to select the desired channel storage bank to program.
2. Press **TRUNK** to access the ID list and set the correct trunking bank type. If the bank has never been programmed with a trunking system, the scanner will display **not trunked!** Press **mode**.
3. Press **MODE** until **Motorola** appears in the display. This sets the channel storage bank for Motorola operation.
4. Press **PGM** to return to the channel storage bank.
5. Select a channel to begin programming trunking system frequencies. Use direct channel entry or the ▲ or ▼ keys.
6. Enter the trunking frequency and press **ENTER**. If necessary, press **MODE** to change the receiving mode to **MO** (Motorola).
7. Repeat Steps 5 and 6 to enter the other trunking system control channel frequencies for the system you wish to monitor.

NOTES

- You can also press **FUNC**, then **TRUNK** to access the ID list from manual mode.
- When monitoring Motorola trunked radio systems, it is only necessary to program the trunking control channel.
- For APCO-25 trunking systems using the 9600 bps control channel, program the system using the steps outlined above for Motorola systems. Your scanner will automatically detect the proper control channel type.
- Some systems rotate the control channel on a daily basis. For best results, program all known control channel frequencies into the trunking channel storage bank.
- To program Motorola UHF trunking systems, see "Programming Motorola VHF and UHF Trunking Systems" on Page 34.
- To program Motorola 800 MHz "splinter" systems, see "Programming Motorola 800 MHz Splinter Systems" on Page 36.
- To program Motorola Type I/II fleet maps, see "Programming Fleet Maps" on Page 36.

↙ **NOTE** ↘

It is necessary to program all EDACS system channels into your scanner in Logical Channel Number (LCN) order, beginning with LCN 1 in channel 01 of the channel storage bank. Do not program EDACS system channels in channel 00 of a channel storage bank. Refer to frequency publications or Internet sites to obtain correct LCN frequencies for the EDACS systems you wish to monitor. If the EDACS system you are programming skips channels in the LCN order, leave those channels blank in your scanner.

PROGRAMMING EDACS TRUNKING SYSTEMS

1. Press **PGM** and **FUNC**, and then **▲** or **▼** to select the desired channel storage bank to program. ↘
2. Press **TRUNK** to access the ID list and set the correct trunking bank type. If the bank has never been programmed with a trunking system, the scanner will display *not trunked!* Press **mode**.
3. Press **MODE** until **EDACS** appears in the display. This sets the channel storage bank for EDACS operation.
4. Press **PGM** to return to the channel storage bank.
5. Select a channel to begin programming trunking system frequencies. Use direct channel entry or the **▲** or **▼** keys.
6. Enter the trunking frequency and press **ENTER**. If necessary, press **MODE** to change the receiving mode to **ED**.
7. Repeat Steps 5 and 6 to enter the other EDACS trunking system channels for the system you wish to monitor.

PROGRAMMING MOTOROLA VHF AND UHF TRUNKING SYSTEMS

Your scanner is capable of receiving Motorola trunked radio

systems operating in the VHF and UHF bands. To monitor these systems it is necessary to program the scanner with three additional parameters, the base frequency, step and offset. 💡

Follow these steps to program Motorola trunking frequencies in the VHF or UHF bands:

1. Press **PGM**, and then **TRUNK** to enter the ID program mode.
2. Press **FUNC** and press (or hold) ▲ or ▼ to select the bank.
3. Press **MODE** until **Motorola** appears in the display.
4. Press **FUNC** then **2**. The display indicates

```
Base Freq:  
406.0000  
Offset: 380  
Step:25.0kHz
```

5. While **B** in Base blinks, if necessary, enter the desired Base frequency with the number keys and press **ENTER**. If it is incorrect, press the number keys again to set the base frequency.
6. While **U** in Offset blinks, if necessary, enter the offset number and press **ENTER**. If it is incorrect, then press the number keys again to set the frequency.
7. While **S** in Step blinks, repeatedly press ▲ or ▼ to select the step number, 5,

💡 **HINTS** 💡

- Base frequency, step and offset vary for each individual UHF trunking system. You can get information about these frequencies for the trunking system you want to scan using trunkscanner.com, other Internet sources, or locally published guidebooks.
- Systems with multiple channel ranges can be programmed using PC application software.

6.25, 7.5, 12.5, 15, 25.0, or 50.0kHz, and then press **ENTER**.

PROGRAMMING MOTOROLA 800 MHz SPLINTER SYSTEMS

Certain 800 MHz Motorola trunked radio systems operate using splinter channels that are in between the channels in the normal 800 MHz band plan. These systems are known as “splinter systems”. Your scanner features an offset mode to allow reception of these systems. ↙

1. Press **PGM**, and then **TRUNK** to enter the ID program mode.
2. If necessary, press **FUNC** then **▲** or **▼** to select the desired bank.
3. If necessary, press **MODE** to select Motorola trunking mode.
4. Press **FUNC** , and then **3** to edit the 3600 CC Mode.
5. Press **▲** or **▼** to select **Normal**, **Splinter**, **Table**, or **Multi Table**, and then press **ENTER**.

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.

NOTES

- If the radio appears to be trunking to the wrong frequencies when monitoring an 800 MHz system, you should try to configure the system for splinter operation.
- Splinter systems exist only in the 800 MHz band, and only use the 3600 bps control channel type. Setting splinter configuration on VHF, UHF, 900 MHz and 800 MHz APCO-25 systems will have no effect.

1. Press **PGM**, and then **TRUNK**.
2. Press **FUNC**, and then **▲** or **▼** to select the desired bank.
3. Press **FUNC**, and then press **8**. **Block 0 size code**. Use **15** for type II. **5-00** is displayed.
4. Enter the size code supplied with the Type I system information, referring to the prompts that appear in the display. If the information for your Type I system is not available, try the following common fleet maps: ↙

NOTES

- The default setting of the bank is for Motorola Type II. However, if you set Type I and wish to restore Type II, enter 15 at Step 4.
- To confirm the input, repeat Steps 1-4 and press **ENTER**. Each time you press **ENTER**, you confirm the size code. If you find an error, press **CLR** and begin again at Step 1.

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

Block	Size Code							
	6	S0	S4	S0	S0	S0	S12	S12
7	S0	S4	S0	S4	S0	—	—	—

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


Talkgroup IDs

Each channel storage bank has an associated talkgroup ID list, for a total of 10 talkgroup ID lists. Each ID list has 5 sub-banks. Each sub-bank has 30 ID locations. You can program up to 150 talkgroup IDs in each bank, so you can program up to 1500 talkgroup 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 associated ID list. 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 all transmissions except those you specifically exclude, and displays the ID's text tag if you have stored the ID. For a detailed description of Open and Closed Mode operation, see "Open and Closed Mode Operation" on Page 87.

NOTE

When you try to store more than 150 talkgroup IDs in a bank, **Memory Full!** appears in the scanner's display. Clear some talkgroup IDs in order to store new ones (see "Clearing Talkgroup IDs" on Page 91).

Storing Talkgroup IDs

Each talkgroup on a trunked radio system is identified by a talkgroup ID. You can store talkgroup IDs automatically while scanning the trunked system in Open mode, or manually by entering the IDs directly in the ID list. 

To automatically store a talkgroup ID, press **TRUNK** when the scanner stops on a voice channel transmission or when a talkgroup ID is indicated in the manual mode. The ID of the active talkgroup will be automatically stored in the next available ID memory location. The bottom line of the scanner display indicates where the ID was stored as ID save X-YY and then changes to ID#ZZZZZ, where X is the sub-bank number, YY is the ID number within the sub-bank, and ZZZZZ is the stored talkgroup ID code.

If the ID has already been stored when you press **TRUNK**, **invalid ID** appears in the scanner's display.

Follow these steps to manually store talkgroup IDs or to edit a stored ID.💡

1. Navigate to a channel in the desired trunking bank using **MAN** or the **▲** or **▼** keys
2. Press **PGM**.
3. Press **TRUNK**.
4. Select the ID memory you wish to edit using any of the methods described above.
5. Enter the talkgroup ID and press **ENTER**. If necessary, use the decimal point for a hyphen.📌
6. If you want to tag the ID, press **TEXT**, enter the desired text tag for the ID. Then press

💡 HINTS 💡

Use the following keystrokes to navigate through the ID lists:

- Press **PGM**, **TRUNK** to enter the ID list for the current channel storage bank.
- Press and release the **▲** or **▼** keys to scroll through the ID memories one at a time.
- Press and hold the **▲** or **▼** keys to scroll through the ID memories rapidly.
- Press **TRUNK** to advance to the next ID sub-bank.
- Press **FUNC ▲** or **▼** to advance to the next or previous ID list.

📌 NOTES 📌

- If you made a mistake in Step 5, **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 (EDACS) ID. The default setting is decimal ID entry. To toggle AFS or decimal EDACS ID display, press **FUNC** then **2**. **AFS Format** will appear in the display for about 2 seconds. Now you can enter EDACS ID codes in AFS format.
- If you entered an ID code that is already stored in another ID channel, **Dupl ID** appears in the scanner's display. If you want to store the ID code anyway, press **ENTER**. To cancel the operation, press **CLR**.

ENTER (see “Text Input Chart” on Page 48).

7. To store the next ID memory in sequence, press ▲ and repeat Step 5.
8. Press **SCAN** to start scanning.

When automatically storing trunked IDs in the ID list by pressing **TRUNK** during a trunked transmission, the scanner will automatically store the active ID in the next available open ID storage location in the ID list. We suggest leaving ID sub-bank 0 empty when first setting up an ID list. This provides a location for new auto-store IDs to be placed and organized.

Programming the Priority Channel

In addition to the 500 programmable memory channels, the scanner has one priority channel.

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

Programming a stored channel frequency in the priority channel

1. Press **MAN**.

NOTES

- The priority feature does not operate while the scanner receives a trunking voice channel or during trunking delay time. Traffic on the priority channel may be missed if it occurs while the scanner is monitoring a trunking voice call.
- If you program a weather channel as the priority channel, then activate priority mode, the scanner stops on the weather channel only when the scanner detects the 1050 Hz weather alert tone.

2. Use the number keys to enter the channel number that contains the frequency you want to program as the priority channel, and then press **MAN** again.
3. Press **FUNC**, and then **PRI**. **Pri Channel** blinks on the bottom line to indicate storage of the current frequency into priority channel memory.

Programming the Priority Channel Directly

1. Press **PGM**.
2. Press **PRI**.
3. Enter the frequency you want to enter into the priority channel, then press **ENTER**.
4. If desired, set the priority channel mode. You can set a priority channel for CTCSS or DCS operation with a programmed code.

Programming a Weather Channel as Priority

1. Press **WX**.
2. Select the weather channel you want to program as the priority channel by pressing **WX** repeatedly until the desired weather channel is displayed.
3. Press **FUNC**, and then **PRI**. **Pri Channel** flashes on the bottom line two times.

NOTES

- This scanner cannot set a channel as the priority channel if the channel's receive mode is MO or ED.
- In the event of a weather or other hazard warning, a 1050 Hz tone is transmitted prior to the message. The scanner detects the presence of this tone during the sampling process. The scanner sounds an audible alert and switches to the weather frequency if the alert tone is detected.
- Because the scanner does not priority sample the weather channel while monitoring trunked talkgroup calls, it is possible that the 1050 Hz alert tone may be missed between sample intervals when trunked systems are being scanned. We recommend the use of a dedicated RadioShack Weatheradio® during times when severe weather notification is critical for your safety, such as when boating or when you know that the potential for severe weather exists in your area.
- To turn off the priority feature, press **PRI**.

Activating the Priority Feature

Press **PRI** while scanning or manually parked on a channel.

PRI (or **PRIWX** if you set the priority to a weather frequency) appears on the bottom line of the display, and **P** will appear in the top line while scanning or parked on a channel in manual mode. If the scanner detects activity on the priority channel, **Pri Channel** appears in the scanner's display. If the scanner detects the 1050 Hz weather alert tone in Priority WX mode, the display will show **Weather ALERT** and the scanner sounds an alert tone (see "SAME Standby Mode" on Page 64). Press **WX** to listen to the weather alert message.

Programming channels for CTCSS and DCS operation

Your PRO-96 scanner features an advanced, DSP based CTCSS and DCS decoder. CTCSS and DCS allow you to program frequencies into your scanner that are used by more than one group in your area and listen only to the group that is of interest to you by specifying the group's specific CTCSS or DCS code. CTCSS and DCS can also help reduce instances where interfering signals cause your scanner to stop on one channel.

There are two ways you can program your scanner to operate with CTCSS and DCS. If you know the CTCSS or DCS code that is used on a particular frequency, you can manually enter the code

when you are programming the scanner, or any time afterwards.

You can also set a special search code up that will instantly decode the CTCSS or DCS code on a received transmission. Channels programmed with the search code will receive all traffic on the channel, and will instantly decode and display any CTCSS or DCS code that is found with the transmission. You can then store the found code in the channel memory with one keystroke.

This section of the manual describes the process for configuring a memory channel for CTCSS or DCS operation and manually programming a known code. For more information on using the CTCSS and DCS feature while scanning, see “Using CTCSS and DCS” on Page 50.

To program channel memories for CTCSS or DCS operation, follow these steps:

1. First, enter a conventional frequency. See “Storing Conventional Frequencies” on Page 30.
2. Once you have entered the frequency, press **MODE** until the desired mode appears in the upper left hand corner of the display. Use CT for CTCSS, and DC for DCS.
3. By default, the search code (indicated with **SEARCH** in the bottom of the display) is programmed. To program a specific code, press **FUNC**,

MODE, and then use the arrow keys to scroll to the desired CTCSS or DCS code. You can also use the keypad to enter the code manually. Note that the scanner will automatically fill the code field as you enter the code.

4. Once the desired code is selected, press **ENTER** to store the code in the channel memory.
5. It is possible to program memory channels for CTCSS or DCS operation at any time. Simply place the scanner in program mode, navigate to the channel you wish to change, and follow the steps above.
6. When stopped on an active conventional channel while scanning, you can press **MODE** to cycle through the valid modes for that channel, including CTCSS and DCS. This will reset any stored CT or DC code to the search code, allowing you to easily check for other CT or DC codes that may be present on the frequency.

NOTE
 CTCSS, DCS and digital voice all operate independently of each other. If a channel is configured for CTCSS or DCS, it will not be able to decode digital transmissions. Use the FM mode when mixed analog and digital voice reception is desired.

CTCSS Code Table:

67.0 Hz	94.8 Hz	131.8 Hz	171.3 Hz	203.5 Hz
69.3 Hz	97.4 Hz	136.5 Hz	173.8 Hz	206.5 Hz
71.9 Hz	100.0 Hz	141.3 Hz	177.3 Hz	210.7 Hz
74.4 Hz	103.5 Hz	146.2 Hz	179.9 Hz	218.1 Hz
77.0 Hz	107.2 Hz	151.4 Hz	183.5 Hz	225.7 Hz
79.7 Hz	110.9 Hz	156.7 Hz	186.2 Hz	229.1 Hz
82.5 Hz	114.8 Hz	159.8 Hz	189.9 Hz	233.6 Hz

85.4 Hz	118.8 Hz	162.2 Hz	192.8 Hz	241.8 Hz
88.5 Hz	123.0 Hz	165.5 Hz	196.6 Hz	250.3 Hz
91.5 Hz	127.3 Hz	167.9 Hz	199.5 Hz	254.1 Hz

DCS Code Table:

6	50	125	174	255	343	445	526	703
7	51	131	205	261	346	446	532	712
15	53	132	212	263	351	452	546	723
17	54	134	214	265	356	454	565	731
21	65	141	223	266	364	455	606	732
23	71	143	225	271	365	462	612	734
25	72	145	226	274	371	464	624	743
26	73	152	243	306	411	465	627	754
31	74	155	244	311	412	466	631	
32	114	156	245	315	413	503	632	
36	115	162	246	325	423	506	654	
43	116	165	251	331	431	516	662	
47	122	172	252	332	432	523	664	

GENERAL PROGRAMMING NOTES

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. Navigate to the channel that you wish to label using direct channel entry, ▲ or ▼ or **FUNC ▲** or **▼**
2. Press **PGM. Ⓜ** in the display changes to **P** to indicate program mode.

 **NOTE** 

If you make a mistake, press ▲ or ▼ to move to the character you want to change, or **CLR** to backspace and delete unwanted characters, or press and hold **CLR** to abort the text entry.

3. Press **TEXT**. A cursor will appear at the third line.
4. Enter the text using the numeral keys (see “Text Input Chart” on Page 48). 

For example, to identify a channel as “FIRE Ch 6” (for “Fire Channel 6”):

“F” is the third letter associated with 3 on the keypad. Press 3, and then 3.

“I” is the third letter associated with 4 on the keypad. Press 4, and then 3.

“R” is the third letter associated with 7 on the keypad. Press 7, and then 3.

“E” is the second letter associated with 3 on the keypad. Press 3, and then 2.

Space is entered by pressing **./DELAY**.

“C” is the third letter associated with 2 on the keypad. Press 2, and then 3.

“h” is the second letter associated with 4 on the keypad. Press 4, and then **FUNC** (for the lower case set), and then press 2.

Space is entered by pressing **./DELAY**.

“6” is the sixth number associated with 1 on the keypad. Press 1, and then 6.

5. Press **ENTER** to store the text with the channel.

Assigning a Text Tag to a Group ID

1. Press **PGM**.
2. Press **TRUNK**.
3. Press **FUNC** then **▲** or **▼** to select the desired bank.
4. Press **TRUNK** to select the desired sub-bank.
5. Press or hold down **▲** or **▼** to select the desired group ID.
6. Press **TEXT** then enter the text using the numeral keys (see "Text Input Chart" on Page 48). Use **▲**, **▼**, or **CLR** to edit your entry, or press and hold **CLR** to abort the text entry.
7. Press **ENTER** to store the text with the ID.

Assigning a Text Tag to a Channel Storage Bank

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

1. Press **PGM**.
2. Press **FUNC**, and then 7. The cursor appears at the third line of the display. Enter the text using the keypad. (See "Text Input Chart"). Use **▲**, **▼**, or **CLR** to edit your entry,

- NOTES**
- To enter a number, press **1**, then press the desired number you want to enter.
 - To enter a lowercase character or a character from the second set for the key 0, press **FUNC** after pressing the first numeral key.

or press and hold **CLR** to abort the text entry.

3. Press **ENTER** to store the text with the bank.

Text Input Chart

Press	Character	Press	Character
1	1 2 3 4 5 6 7 8 9 0		
2	A B C	2 FUNC	a b c
3	D E F	3 FUNC	d e f
4	G H I	4 FUNC	g h i
5	J K L	5 FUNC	j k l
6	M N O	6 FUNC	m n o
7	P Q R S	7 FUNC	p q r s
8	T U V	8 FUNC	t u v
9	W X Y Z	9 FUNC	w x y z
0	. - # _ @ + * & / ,	0 FUNC	\$ % ! ^ () ? -> ' <-
./DELAY	Space	CL	Backspace

OPERATING YOUR SCANNER

INITIAL PREPARATION

Turning on the Scanner and Setting Squelch

1. To turn on the scanner, turn **VOLUME** clockwise. **DSP** loading message and **Welcome To Digital Trunking** appears in the display. After about 5 seconds, you might hear a rushing sound. Then adjust

VOLUME to a comfortable level.

2. Turn **SQUELCH** fully counterclockwise until the indicator points to **MIN**, then turn **SQUELCH** clockwise until the rushing sound stops.
3. To turn off the scanner, turn **VOLUME** counterclockwise to **OFF**.

Scanning

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

The scanner scans through all channels (except those you have locked out) in the active channel storage banks (see “Turning Channel Storage Banks Off and On” on Page 49 and “Locking Out Channels or Frequencies” on Page 67).

Turning Channel Storage Banks Off and On

To turn off channel storage banks while scanning, press the bank's number key so the bank's number disappears. For example, to turn off bank 1, press **1**. The scanner does not scan any of the channels within the banks you turned off.

To turn on channel storage banks while scanning, press the number key until the bank's number appears. For example to turn bank 1 on again, press **1**.

You cannot turn off all channel storage banks. There must be at

NOTES

- The scanner will not enter scan mode if there are no frequencies stored in channels, or if all channels are locked out in the channel storage bank(s) that you are attempting to scan. In either of these cases, the scanner will display **All channels Locked out!** See “Programming Your Scanner” on Page 30.
- If **SQUELCH** is adjusted so you always hear a rushing sound, the scanner will not scan properly. Rotate the squelch control until the rushing sound stops.
- If **SQUELCH** is adjusted precisely at the threshold where the rushing sound stops, the radio will be most sensitive to very weak signals. The radio may also receive unwanted noise or signals that are too weak to understand. Most users prefer to position the squelch control a little bit past the point of threshold to avoid receiving noise or signals that are too weak to understand.
- You must store frequencies into channels before the scanner can scan them. The scanner does not scan through empty channels.
- To change the scanning direction, press **▲** or **▼** while scanning.

NOTES

- You can use the scanner's delay feature while searching the search bank. See "Using the Delay Function" on Page 66.
- You can set CTCSS or DCS mode when searching any search range, except for SR0, SR1, and SR4. The scanner will display detected CTCSS or DCS codes depending on the mode setting. See "Using CTCSS and DCS" on Page 50.
- The scanner does not search locked-out frequencies while searching ranges. See "Locking Out Channels or Frequencies" on Page 67.
- You can use the **PAUSE** key to temporarily pause the search operation. The scanner will remain on the frequency that was active when **PAUSE** was pressed until you press **PAUSE** again. You can simply listen to the radio traffic on the paused frequency, or perform copy operations to save the frequency to a channel before you resume your search (see "Using Frequency Copy" on Page 61).

least one active channel storage bank.

You can manually select any channel in a channel storage bank, even if the bank is turned off.

Monitoring a Single Channel/Battery Save Circuit

You can monitor a single channel with your scanner by navigating to that channel while in manual mode. The scanner will receive traffic on the selected frequency.

Your scanner features a battery save circuit that is automatically activated any time you manually select a channel. The battery save mode works by allowing the receiver to "sleep" briefly while waiting for a call on the selected channel. The battery save circuit is disabled when the scanner is tuned to a channel in program mode.

Using CTCSS and DCS

Your scanner's advanced, DSP based CTCSS and DCS decoder allows you to listen only to the group that is of interest to you by specifying the group's specific CTCSS or DCS code for a certain frequency. CTCSS and DCS can also help reduce instances where interfering signals cause your scanner to stop on one channel.

When your scanner stops on a conventional frequency that is configured for CTCSS or DCS, it checks for a match between the

transmitted CTCSS or DCS code and the code that is stored with the channel memory. If the transmitted and stored codes match, the scanner stops on the transmission and allows the audio to pass to the speaker. If the codes do not match, the scanner resumes scan operation. If the special “search” code is in use, the scanner will instantly display any detected CTCSS code if programmed for CTCSS mode, or DCS code if programmed for DCS code. You can store the detected code into the channel memory by pressing **ENTER** while the code is displayed.

For more information about your scanner’s receive modes, including CTCSS and DCS, see “Understanding Your Scanner’s Channel Receive Modes” on Page 19. For information on programming memory channels for CTCSS or DCS operation, see “Programming channels for CTCSS and DCS operation” on Page 42.

Deleting Frequencies from Channels

In certain circumstances you may wish to completely clear the contents of a channel. One example would be to create empty channels in a selected channel storage bank so the frequency copy function has empty channels available for copied frequencies. (See “Copying a Frequency into a Vacant Channel in a Specified Bank” on Page 63.)

1. Press **PGM**.

2. Use the number keys and press **PGM** to select the channel with the frequency you want to delete, or use the **▲** or **▼** keys to navigate to the desired channel.
3. Press **FUNC**, and then **CLR**. The frequency is cleared, 0.0000 appears in the display.

SEARCHING AND TUNING

Finding and Storing Active Frequencies

You can search for transmissions using the scanner's preprogrammed search banks. The search banks include six preprogrammed search ranges, SR0 to SR5. You can change the search range of Bank SR6 manually by setting the lower and higher ends of the search range.

SEARCHING A PREPROGRAMMED FREQUENCY RANGE

The scanner contains these preprogrammed search ranges, stored in the search bank (SR0-SR6).

Bank	Band
SR0	Marine
SR1	CB
SR2	FRS/GMRS/MURS
SR3	Police/Fire
SR4	Aircraft
SR5	Ham

SR6_____Limit search (User configurable)

Follow these steps to select preprogrammed search bands and search them for active frequencies:

1. Repeatedly press **SRCH** to select your desired search bank (SR0, SR1, SR2, SR3, SR4, SR5, or SR6).
2. In the marine and CB bands, you can directly select a channel or search through the band. When ff appears at the left most position of the second line, you can directly select a channel (refer to "Search Band Charts" on Page 54). Use the numeric keypad to select a specific two digit channel number (for example, press **1 6** to select Channel 16, or **0 5** to select channel 5). You can also change the channels by pressing **▲** or **▼**.

There are several group banks in SR2 Police/Fire and SR4 ham bands. You can turn on the groups by pressing the group numbers. For example, to turn off group 0, press **0**.

3. Press **FUNC**, and then **SRCH** while ff is displayed. ff changes to 5 and now you can search through the band. Press **FUNC**, and then **SRCH** again to return to the previous mode.
4. Rotate **SQUELCH** clockwise and leave it set to a point just

after the rushing sound stops. After 2 seconds (if the delay feature is on), the received frequency appears and the scanner starts searching.

- When the scanner finds an active frequency, it stops searching, and resumes when the transmission ends. If delay is programmed with the search range the scanner will pause for a reply before search resumes.

NOTE

Two frequencies are assigned in one channel in some Marine frequencies. For example, 157.000 and 161.600 are assigned in Channel 20.

Search Band Charts

Search bank:

SR0 Marine band

Receive mode: FM/Digital

Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	156.0500	05	156.2500
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 160.8250	65	156.2750
66	156.3250	67	156.3750
68	156.4250	69	156.4750

Channel	Frequency (MHz)	Channel	Frequency (MHz)
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		

**Search bank:
SR1 CB band**

Receive mode: AM

Channel	Frequency (MHz)	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

Channel	Frequency (MHz)	Channel	Frequency (MHz)
37	27.3750	38	27.3850
39	27.3950	40	27.4050

**Search bank:
SR2 FRS/GMRS/MURS**

**Receive Mode:
FM/Digital, CT or DC**

Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	462.5625	02	462.5875
03	462.6125	04	462.6375
05	462.6625	06	462.6875
07	462.7125	08	467.5625
09	467.5875	10	467.6125
11	467.6375	12	467.6625
13	467.6875	14	467.7125
15	462.5500	16	462.5750
17	462.6000	18	462.6250
19	462.6500	20	462.6750
21	462.7000	22	462.7250
23	151.8200	24	151.8800
25	151.9400	26	154.5700
27	154.6000		

**Search bank:
SR3 Police/Fire band**

**Receive Mode:
FM/Digital, CT or DC**

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
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: SR4 Aircraft

Receive mode: AM

Frequency (MHz)	Step (kHz)
108.000 – 136.9875	12.5

Search bank: SR5 Ham band

**Receive mode:
FM/Digital, CT, DC or AM
(depending on group)**

Group	Frequency (MHz)	Step (kHz)
0	28.0000 – 2937000	5
1	50.0000 – 54.0000	5
2	144.0000 – 148.0000	5
3	222.0000 – 225.0000	5
4	420.0000 – 450.0000	12.5
5	1240.0000 – 1300.0000	6.25

**Search bank:
SR6 Programmable limit search**

**Receive mode:
FM/Digital, AM, CT or DC**

Searching Active Frequencies in
Your Desired Frequency Range

You can search a specific range of
frequencies by programming SR6
with lower and upper frequency
limits.

1. Press **PGM** then **SRCH**. PSR
(Program Search) appears in
the top line and the cursor
blinks L on the second line for
the lower limit frequency.
2. Use the number keys and
/DELAY to enter the desired
lower limit frequency
(including the decimal point).

3. Press **ENTER** to set the lower limit frequency. The cursor moves to upper frequency field. If the entered frequency is incorrect, **Invalid Freq** briefly appears in the scanner's display.
4. Enter your desired upper frequency and press **ENTER**.
5. Rotate **SQUELCH** clockwise and leave it set to a point just after the rushing sound stops.
6. Press **SRCH** to start searching. When the scanner finds an active frequency, it stops searching.

USING ZEROMATIC

You can set Zeromatic on or off by pressing **FUNC** then **0**. Press **FUNC**, and then **0** again to toggle the Zeromatic setting. When this feature is turned on, **Zeromatic On** briefly appears in the display, then **z** appears at the first digit of the second line. When searching with Zeromatic on, the scanner will automatically tune to the correct center frequency (or the step increment closest to the correct center frequency). When searching with Zeromatic off, the scanner will unmute faster on a detected signal but the frequency may not be exact. If the scanner stops on a signal before it reaches the correct center frequency, you can step up or down to the correct frequency using the **▲** or **▼** keys. Zeromatic functions only in search banks 2, 3, 4, 5 and 6.

USING SEEK SEARCH

While the scanner is searching, you can activate seek search by pressing **FUNC** then **7**. **Seek On** appears on the bottom line. The scanner stops on each active frequency for five seconds and resumes searching automatically. Seek functions only in search banks 1, 2, 3, 4, 5, and 6.

- You can copy and save a frequency into a specified bank, channel, or priority channel when the scanner finds an active frequency. See “Using Frequency Copy” on Page 61 to save the frequency. The frequency copy works only in search banks 1, 2, 3, 4, 5, and 6.
- There are several group banks in SR2 Police/Fire and SR4 ham bands. You can turn off or on the groups by pressing the group numbers. For example, to toggle group bank 0, press **0**.
- In the Air and Limit search bands, press **FUNC** then press **▲** to start searching up from the lowest frequency or press **▼** to start searching down from the highest frequency.
- You can press **▲** or **▼** at any time to change the search direction, or force a search resume while stopped on an active frequency.
- Use **▲** or **▼** while paused to increment the frequency one step at a time.

MANUALLY TUNING A FREQUENCY

You can manually set the scanner to move through all receivable frequencies, or select a specific frequency as a starting point.

1. Press **TUNE**. **TUNE** and the current frequency appear in the display. The scanner automatically begins tuning up or down.
2. Use the number keys to enter the frequency where you want the scanner to start.
3. Press **ENTER**. After two seconds the scanner will automatically tune from the entered frequency.
4. Press **▲** or **▼** to change the direction of the tune. When the scanner finds an active frequency, it stops on the frequency. ↙

USING FREQUENCY COPY

You can easily copy a frequency into a specified channel, a vacant channel in a specified bank, or a priority channel. This feature provides an easy method of storing frequencies of interest you encounter while searching or tuning. ↙

NOTES

Manually Tuning a Frequency

If you press **PAUSE** while tuning, the scanner stops tuning and ****PAUSED**** appears in the display. Press **PAUSE** again, and the scanner resumes tuning. While tune mode is paused, you can step up or down one frequency at a time by using the **▲** or **▼** keys.

Using Frequency Copy

You cannot copy a frequency from the Marine search bands.

COPYING A FREQUENCY INTO A SPECIFIED CHANNEL

You can copy a frequency into a specified channel when the scanner stops on that frequency during search mode or manual tuning. If a CTCSS or DCS code is detected on the transmission, the detected code will be copied into the channel memory as well.

NOTE

If you try to copy a frequency that is already stored, the scanner sounds the notice tone 3 times after you press **ENTER**. **Dupl.f Chxxx** appears at the bottom line. If you want to copy the duplicate frequency anyway, press **ENTER**, or if not, press **CLR** to cancel.

1. Press **FUNC**, and then **PGM** when you find a frequency. **Chan Store?** appears on the bottom line. After about 1 second, the frequency to be copied flashes on the indicator.
2. Press the desired bank and the channel number where you want to store the frequency. The display indicates the bank and channel number, and briefly displays the frequency that is currently programmed into the selected channel. You can repeat this step as needed until you find an acceptable destination channel. After about 1 second, the frequency to be copied flashes.
3. Press **ENTER**. All the conditions such as receive mode and delay condition are copied onto the channel. **Chan Store!** briefly appears in the scanner's display. The scanner automatically returns to search mode.

COPYING A FREQUENCY INTO A VACANT CHANNEL IN A SPECIFIED BANK

You can copy a frequency into a vacant channel in a specified bank when the scanner stops on the frequency during search or tune mode. ↙

1. Press **FUNC**, and then **ENTER** when you find a frequency you want to copy. **Bank9 Store?** appears in the scanner's display.
2. If you want to copy the frequency into bank 9, press **ENTER**. It is stored in the first available vacant channel in the bank. Or, press your desired bank number to store, then press **ENTER** to store the frequency in the selected bank. **Chan Store!** appears for 2 seconds. All the conditions such as receiving mode and delay condition are copied on the channel. After about 2 seconds, the scanner automatically returns to search mode.

COPING A FREQUENCY INTO THE PRIORITY CHANNEL

You can copy a frequency into the priority channel (see "Programming the Priority Channel" on Page 40) when the scanner stops on the frequency during Search, Scan, Manual, Tune, or WX mode.

NOTE ↙

If you try to copy a frequency that is already stored in the same bank, the scanner sounds the notice tone 3 times after you press **ENTER**. **Dupl.f Chxxx** appears at the bottom line. If you want to copy the duplicate frequency anyway, press **ENTER**, or if not, press **CLR** to cancel.

Press **FUNC**, and then **PRI** when the frequency is on the display. The display flashes twice and the frequency is copied to the priority channel.

SPECIAL FEATURES

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 on the first active weather frequency. Press **WX** repeatedly to find the strongest weather frequency for your location. If necessary, use **ATT** to apply attenuation to weather channels with interference.

SAME Standby Mode

The National Weather Service precedes each weather alert with

a digitally encoded SAME (Specific Area Message Encoding) signal, then a 1050 Hz tone. The SAME signal includes a FIPS (Federal Information Processing Standard) area code, and an event code that corresponds with the type of alert being sent. You can configure your scanner to operate in SAME Standby mode, where it monitors a selected weather radio station for SAME alerts for areas you specify. You can program your scanner with up to 10 FIPS codes for the areas you desire. The National Weather Service maintains a current list of FIPS codes at [http:// www.nws.noaa.gov/nwr/](http://www.nws.noaa.gov/nwr/) .

To configure your scanner for SAME Standby mode, follow these steps:

1. Press **WX** until you identify the weather station with the strongest signal for your location.
2. Press **FUNC**, and then **PROG** to access the FIPS code entry table.
3. Use the **▲** or **▼** keys to select the desired FIPS code storage location.
4. Use the numeric keys to enter the desired FIPS code, and then press **ENTER** to store the code. Press **TEXT** to label the code entry with an alphanumeric text table if desired. Repeat this process for all the FIPS codes that you wish to store.

NOTES

- Press **WX**, then the numeric keys **0-9** to quickly review stored FIPS codes. Press **L/OUT** to toggle lockout status.
- Your scanner can also detect the 1050 Hz weather alert tone when a weather channel is set as the priority channel and weather priority operation is enabled. (see "Programming a Weather Channel as Priority" on Page 41). In this mode all alerts are received. FIPS settings are ignored.
- The scanner sounds an alert or beep when it receives the SAME code. If you do not stop the alert (or beep) for five minutes, the alert stops and the scanner beeps every ten seconds. If the scanner receives a new message after five minutes, it sounds the alert or beep. To stop the sound and ready the scanner to receive a new alert signal before the five minute time out, press any key except **LIGHT**.

5. Press **L/OUT** to lock out or enable specific FIPS entries.
6. Press **WX** to exit the FIPS code entry table.
7. Press **FUNC**, and then **WX** to initiate SAME standby. The scanner will monitor the selected weather radio station for alerts with FIPS codes that match the codes you entered in the FIPS entry table. To exit SAME standby, press **FUNC**, and then **WX**.

Weather Alert Alarm Demonstration

To hear the SAME weather alert alarms, press **WX** for more than 2 seconds while **SAME Standby** is active.

The display indicates the type of message, and the scanner sounds the alarm associated with that type of message. The alarm sound changes automatically every 3 seconds.

Press any key except **LIGHT** to end the alarm demonstration mode.

USING THE DELAY FUNCTION

You can configure your conventional, non-trunked channels for a 2 second delay to avoid missing reply traffic on the same channel. When delay is set for a conventional channel, the scanner will pause for reply traffic before resuming the scan operation.

To toggle the delay setting for a channel, press **/DELAY**.

LOCKING OUT CHANNELS OR FREQUENCIES

You can lock out channels to force the scanner to skip and ignore any traffic while scanning. You can also lock out up to 50 frequencies while searching to skip undesired transmissions.

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** so **L** appears in the scanner's display.

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

Reviewing the Lock-Out Channels

To review all locked out channels, press **MAN**, and then repeatedly press **FUNC** and then **L/OUT**. The scanner will advance to the next locked out channel each time you press **FUNC**, and then **L/OUT**.

Locking Out Search Frequencies

To lock out a frequency during a search, press **L/OUT** when the scanner stops on that frequency. The scanner will lock out the frequency and continues searching.

NOTES

Using the Delay Function

- Delay is automatically set as the default for each channel when you turn on the scanner.
- The delay function operates differently when monitoring trunked radio systems. For more information, see "Trunked Delay Function" on Page 90.

Locking Out Channels

- You can still manually select and monitor locked-out channels.
- Locking out a channel with an active trunking control channel will disable monitoring of that trunking system.

Locking Out Search Frequencies

- You can lock out as many as 50 frequencies in each search bank. If you try to lock out more, **Memory full!** will appear in the display, and you will be unable to lock out any more frequencies until some have been cleared. See "Clearing a Locked-Out Search Frequency" on Page 68".
- If you lock out all frequencies in one search bank and only this search bank is activated, **All ranges Locked out!** appears in the display and the scanner will not search.

Reviewing Locked-Out Search Frequencies

To review the frequencies within a search bank that you locked out:

1. Press **SRCH** to set search mode, and select the desired search bank to review its locked out frequencies.
2. Press **FUNC** and then **L/OUT**. The last locked-out frequency and **Lockout list** appear. Press **▲** or **▼** to scroll through the list. The locked-out number and the total locked-out number also appears as **L/O XX of YY**. (The tenth of twenty five locked out frequencies would appear as **L/O 10 of 25**). If the search bank has no locked-out frequencies, **Empty. Lockout list** appears in the scanner's display. Press **SRCH** to cancel reviewing locked-out frequencies.

Clearing a Locked-Out Search Frequency

To clear a locked-out frequency, select that frequency (see ““Reviewing the Lock-Out Channels”), and then press **CLR**.

If all locked-out frequencies are cleared within a channel storage bank, **Empty. Lockout list** appears in the scanner's display.

Clearing All Locked-Out Frequencies in a Search Bank

1. Press **SEARCH**.

2. Select the search bank in which you want to clear all locked-out frequencies.
3. Press **FUNC** and then press **L/OUT**. Lockout list appears in the scanner's display.
4. Press **FUNC** and then **6**. The scanner will display **Confirm list clear? 1=YES Press other key for NO**. Press **1** to clear all locked-out frequencies. **List cleared** appears for about 2 seconds. Press any key other than **1** to cancel clear.

CHANGING THE RECEIVE MODE



The scanner defaults to the commonly used AM or FM/Digital receive mode for each frequency range. The preset mode is correct 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.

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


AM – configures the channel for AM mode.

FM/DIGITAL– configures the channel for the FM/DIGITAL mode.

CT – configures the channel for CTCSS mode.

 **NOTE** 
MO and ED modes are not available when performing service searches, limit searches and the TUNE function.

DC – configures the channel for DCS mode.

MO – configures the channel for the MO mode for analog or digital Motorola trunking system channels, or APCO-25 trunking system channels. 

ED – configures the channel for the ED mode for EDACS trunking system channels.

USING THE ATTENUATOR

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

There are two attenuator modes in your scanner. Normal attenuator mode allows you to set the attenuator on a per-channel basis. Normal mode is useful when individual channels are found to be prone to interference.

Global attenuator mode applies attenuation to every channel in the scanner, and overrides any normal mode attenuator settings that you may have entered

To assign attenuation to a channel in the scanner:

Press **ATT** when the scanner is stopped on a channel, or by manually navigating to a channel by using direct channel entry or pressing the ▲ or ▼ arrow keys. **R** will appear in the top line of the display. Press **ATT** again to toggle attenuation off.

To assign attenuation to a search bank:

Press **ATT** while searching. Attenuation will be applied to the active search bank, or search group within a search bank. Press **ATT** again to turn attenuation off. ↙

To use the global attenuator:

1. Press **FUNC** and then **ATT** to set the attenuator to global mode. **Global ATT** will appear for 2 seconds at the bottom line, and then **ATT-** appears in the scanner's display while scanning.
2. Press **ATT** to activate the attenuator. **ATTon** appears in the bottom line of the display. When the scanner is stopped on a channel or searching, **a** will appear in the top line of the display. Press **ATT** to toggle global attenuation off. **ATT-** appears on the bottom line of the display while scanning.
3. Press **FUNC** and then **ATT** again to turn off the global attenuation mode. **Normal ATT** appears on the bottom line for about 2 seconds.

TURNING THE KEY TONE ON AND OFF

Each time you press any of the scanner's keys, the scanner sounds a tone. You can turn the scanner's key tone off or on.



NOTES

- The attenuator is very effective at reducing strong signal overload interference when using the scanner in areas close to cellular telephone transmitting facilities.
- If you turn on the attenuator, the scanner might not receive weak signals.
- Activating the normal attenuator mode on a Motorola or APCO Project 25 trunking control channel will apply attenuation to all calls received on that trunking system. You can press **ATT** during a trunking call or while manually tuned to a system control channel to toggle attenuation on or off for the trunking system.

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 Digital Trunking** appears in the scanner's display.
3. While **Welcome To Digital Trunking** appears, press **1** to turn on the key tone or **2** to turn it off.


USING THE DISPLAY BACKLIGHT



Your PRO-96 features a backlit keypad and display for easy viewing and use in dark environments. There are three backlight modes you can choose from to control backlight activation, Normal mode, Keypress mode, and first keypress ignore mode.

In Normal mode, press  to activate the backlight. The backlight will activate and remain on for the factory default setting of 5 seconds. The backlight continues to remain on while you are operating the keypad. To turn off the backlight before it automatically turns off, press  again.

In Keypress mode, the backlight will light automatically when you press any key on the keypad, and function as described above in Normal mode. This mode is useful if you want the backlight to come on automatically when you

perform an operation using the keypad.

In Ignore mode, the backlight functions as described in Keypress mode, except that the scanner ignores the first keypress. This mode is useful when you wish to quickly illuminate the display and keypad without having to search for the  key. The first keypress is ignored, and the scanner sounds the low pitched error beep to remind you that the first key pressed to activate the backlight is ignored by the scanner.

In any backlight mode, you can press and hold  for about 1 second to force the backlight on full time. Press  while the backlight is on to turn it off.



You can also change the backlight mode and duration.

1. If the scanner is on, turn it off and back on again. **Welcome To Digital Trunking** appears in the scanner's display.
2. While **Welcome To Digital Trunking** appears, press **LIGHT**.
3. Press **▲** or **▼** to select the desired backlight mode and duration. Selecting 3, 5, 10 or 20 sets the backlight mode for normal operation for the selected duration. Selecting K3, K5, K10 or K20 sets the backlight mode for Keypress operation for the selected duration. Selecting I3, I5, I10 or I20 sets the backlight mode





for Ignore operation for the selected duration.

4. Press **ENTER** to store your selection.

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**,  / , **SQUELCH**, and **VOLUME**.

You cannot activate the key lock while you are entering a frequency into a channel.

1. To turn on the key lock, press **FUNC** and then  / . **Key locked** appears for about 1 second. **Key locked.** appears when you press any key after locking the keypad, and the scanner sounds the low pitched Invalid tone.
2. To turn off the key lock, press **FUNC** and then  / . The scanner beeps three times and **Key unlocked** appears in the scanner's display.

CHANGING THE DISPLAY CONTRAST

1. Press **MANUAL**.
2. Press **FUNC** and then **9**. **Use Up/Down keys to set contrast.** appears in the scanner's display.
3. Press **▲** or **▼** to adjust the contrast.

4. Press **ENTER** to set the display contrast.

WORKING WITH V-SCANNERS

The PRO-96 V-Scanner (Virtual Scanner) feature allows you to edit, store, recall and use up to eleven full sets of scanner memory profiles. With V-Scanners it is possible to create separate scanner memory profiles for different areas you visit or different ways that you use the scanner.

Your scanner contains two types of storage memory. **Working memory** is the memory that your scanner uses while you are programming, cloning, or using your scanner. **V-Scanner memory** is the memory that your scanner uses to store saved configurations in **V-Scanner folders** for later recall and use. Your scanner features ten V-Scanner folders (0-9) for configuration storage. An additional "scratchpad" V-Scanner folder can be accessed with the decimal point (.) key and is indicated in the display with the "#" symbol. The scratchpad folder offers a convenient location to temporarily store the contents of working memory when managing the V-Scanner memory.

Working with V-Scanner folders is much like working with computer application files, such as spreadsheets and word processing documents. Any programming changes you make to the scanner's working memory

P708===D=+CT
Welcome Ln-4

—

can be saved to one of the ten V-Scanner folders, or the scratchpad folder. When you save working memory to a V-Scanner folder, all settings contained in working memory are saved, including channels, talkgroups, lockout status, contrast settings, etc. Previously saved V-Scanner folders can be recalled and loaded into working memory. You can also erase the contents of V-Scanner folders, or move the contents of one folder to another using working memory. V-Scanner folder names are stored in Line 4 from the Welcome screen that appears when you first power on the scanner. You can change the contents of line 4 from the current working memory configuration. This information is saved when you store the V-Scanner.

Follow these steps to edit the V-Scanner name stored in Line 4 of the Welcome screen:

1. Press **PGM**
2. Press **FUNC, TEXT**. The scanner will display the Line 4 edit screen with a flashing cursor:
3. Use standard text entry procedures to enter a V-Scanner name, up to 12 characters long. Press **ENTER** when finished. Refer to the "Text Input Chart" on Page 48 for more information on text entry.

You can only change the name of a V-Scanner while it is loaded into

working memory. It is not possible to change the V-Scanner folder name from the V-Scanner menus. Always use **FUNC**, **TEXT** while in program mode to assign a V-Scanner folder name to the current working memory. This name will be stored with the V-Scanner when it is saved, and will appear while you are performing V-Scanner operations. If you press **TEXT** while in a V-Scanner operations menu, you will be prompted to use **FUNC,TEXT** while in program mode to assign or change the name of the V-Scanner folder.

Follow these steps to perform V-Scanner operations:

1. Press **PGM**
2. Press **FUNC**, **PGM**. The scanner will display the V-Scanner menu:

Select the option that corresponds with the function that you wish to execute.

3. If you want to save the contents of the scanner's working memory to a V-Scanner folder, press 1. The scanner will display:

Press the number key that corresponds with the V-Scanner folder you wish to save the current configuration to, or press **CLR** to return to the V-Scanner menu. Your selected folder location and the name of any previously stored V-Scanner will appear in the display. For example,

V-Scanner
1-SAVE
2-LOAD 3-DEL
CL to EXIT

Save to
V-Scanner:
ENTER if YES
CL to EXIT

Save to
V-Scanner: 1
ENTER if YES
My V-Scanner

Save to
V-Scanner: 1
ENT= CONFIRM
My V-Scanner

Saving to
V-Scanner: 1
Please Wait

Load from
V-Scanner:
ENTER if YES
CL to EXIT

Load from
V-Scanner: 1
ENTER if YES
My V-Scanner

assume you are saving to V-Scanner folder 1, and have previously stored a V-Scanner configuration with the name "My V-Scanner" in that location. If you choose V-Scanner Folder 1, the scanner will display:

Press **ENTER** to accept the choice, another number key to change your selection, or CLR to abort and return to the V-Scanner menu. The scanner gives you one final opportunity to abort before proceeding:

Press **ENTER** to confirm your choice and proceed with the V-Scanner save operation.

While saving, the scanner will display:

The contents of the selected V-Scanner folder will be replaced with your current working memory data.

4. To load the contents of a V-Scanner folder to the scanner's working memory, press 2. The scanner will display:

Press the number key that corresponds with the V-Scanner folder you wish to load into the scanner's working memory, or press **CLR** to return to the V-Scanner menu. If you select a V-Scanner folder, the scanner will prompt you to verify your choice. For example, if you

choose V-Scanner Folder 1, the scanner will display:

Press **ENTER** to accept the choice, another number key to change your selection, or **CLR** to abort and return to the V-Scanner menu. The scanner gives you one final opportunity to abort before proceeding:

While loading, the scanner will display:

The contents of the scanner's current working memory will be replaced with the data from the selected V-Scanner folder.

5. To delete the contents of a V-Scanner folder, select 3. The scanner will display:

Press the number key that corresponds with the V-Scanner folder you wish to clear, or press **CLR** to return to the V-Scanner menu. If you select a V-Scanner folder, the scanner will display the name of the V-Scanner currently stored in that folder, and prompt you to verify your choice. For example, if you choose V-Scanner Folder 1, the scanner will display:

Press **ENTER** to accept the choice, another number key to change your selection, or **CLR** to abort and return to the V-Scanner menu. The scanner gives you one final opportunity to abort before proceeding:

**Load from
V-Scanner: 1
ENT= CONFIRM
My V-Scanner**

**Loading from
V-Scanner: 1
Please Wait**

**Delete
V-Scanner:
ENTER if YES
CL to EXIT**

**Delete
V-Scanner: 1
ENTER if YES
My V-Scanner**

**Delete
V-Scanner: 1
ENT = CONFIRM
My V-Scanner**

Clearing
V-Scanner: 1
Please Wait

V-Scanner
Operation
Complete
Press ENTER

V-Scanner
Operation
Failure
Press ENTER

While the folder is being cleared, the scanner will display

This display appears after each V-Scanner operation. Pressing **ENTER** will return to the main V-Scanner menu. Press **CLR** to exit the V-Scanner main menu.

This display appears if a failure is encountered while performing a V-Scanner operation. Press **ENTER** to try again.

If you wish to create a new configuration based on your current one, save the current working memory to a V-Scanner folder, then edit the working memory with your changes. When you are finished with your edits, save your updated working memory to a new V-Scanner folder, leaving the V-Scanner folder with your original configuration intact. You may then use either your original configuration or the modified one.

Be sure to assign a name to each V-Scanner before you save it to a V-Scanner folder. You assign a V-Scanner name while using the configuration in working memory by pressing **PGM**, and then **FUNC**, **TEXT**. The text you enter here is stored in line 4 of the welcome message and saved with the contents of the V-Scanner when you write it to a folder.

You can use the V-Scanner feature to back up your work. Save your configuration to a V-Scanner folder after you make changes to a

working memory configuration. If for any reason your scanner's working memory is accidentally altered or lost, you can recall the backup configuration data from the V-Scanner folder.

There will be an approximately 13 second pause after you select the desired V-Scanner and press the ENTER key to confirm your choice when saving or loading V-Scanner data. During this period the scanner is transferring V-Scanner data to or from working memory. It is important not to interrupt power to the scanner while this is taking place. Loss of power while performing V-Scanner operations may result in lost data. The scanner will not allow you to perform a V-Scanner operation when a low battery condition exists. If you attempt to perform a V-Scanner operation with low battery power, the scanner will display:



**V-Scanner
Battery Low
Aborted
CL-EXIT**

USING THE DIGITAL AGC FUNCTION

You may find that the audio level varies greatly among different users on digital systems that you monitor. Many analog conventional and trunked radio systems include components with automatic gain control to help normalize the audio levels of analog transmissions in the system. Digital radio systems typically do not include any automatic gain control functionality and tend to reproduce a user's voice audio signal more faithfully with regard to audio levels. This

can result in a low level audio signal if a user on the system is not speaking close enough to their radio microphone.

Your PRO-96 features Digital AGC, which can compensate for these low audio levels when they occur. By default, Digital AGC is turned on. If desired, you can toggle the Digital AGC function on or off by pressing **FUNC**, and then **MAN** at any time. The display will briefly show **DSP AGC Off** or **DSP AGC On** accordingly.

 **NOTES** 

Using the Digital AGC Function

- Digital AGC has no effect on analog transmissions.
- You may notice more background noise with Digital AGC on.

Cloning the Programmed Data

CLONE MODE Incorrect Model appears if the scanner receives data from another scanner other than a PRO-96.

CLONING THE PROGRAMMED DATA

You can transfer the contents of the current scanner working memory to and from another PRO-96 scanner using an optional connecting cable with 1/8-inch (3.5 mm) phone plugs on both ends (use Radio Shack part number 42-2420 available at your local RadioShack store), or to a computer application designed to work with this scanner using a PC interface cable (use Radio Shack part number 20-289, available at your local RadioShack store).

Follow these steps to clone the data.

1. Turn on both scanners.
2. Connect the connecting cable to each scanner's PC/IF jack. **CLONE MODE UP to send, remove cable to exit** appears in the scanner's display.
3. Press **▲**. **Confirm send data?**
1=YES Press other key for NO.

appears in the scanner's display.

4. Press 1 to send the data to the other unit or press any other key to cancel the operation.
5. The scanner sends the data. Do not disconnect the PC/IF cable or interrupt power to either scanner while the transfer is taking place.
6. To exit the clone mode, remove the cable.

TRUNKING SPECIAL FEATURES

TRUNKING OPERATION

Your scanner tracks transmissions from Motorola Type I, II and III analog trunked systems, Motorola digital trunked systems, and APCO 25 digital trunked systems. Your scanner also follows transmissions on GE/Ericsson/M/A-COM (EDACS) type systems.

Trunking systems allocate a few frequencies to many different users, and use a control channel to send system activity data to all of the mobile units operating on the system. When a mobile unit wishes to place a call, it sends a call request signal to the trunking system. The system chooses one frequency from allocated system channels in that trunking system and announces the start of the call on the control channel. Your scanner uses the control channel

data to follow activity on the talkgroups you wish to monitor.

Traditional conventional radio systems operate using a single radio frequency for each group of radio users, and in some cases, multiple groups sharing the same radio channel in the same geographical area. This frequently results in heavy traffic and often requires that radio users wait long periods for the frequency to clear before they can place their calls. Trunked systems allow large groups of radio users to use radio frequencies more efficiently. 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.

Your scanner lets you easily hear both the call and response transmissions for that 2-way radio user and therefore follow the entire conversation. For Motorola, APCO-25 and EDACS trunking systems, the scanner monitors the control channel between each transmission to determine active talkgroups.

Your PRO-96 automatically calculates Motorola and APCO-25 trunking system voice channel frequencies while decoding the control channel. This eliminates the need to enter all the Motorola system frequencies.

NOTES

To receive trunking signals from a trunked radio system, you must:

- Store all the trunking *control* frequencies for Motorola or APCO-25 systems in one channel storage bank, *or*
- Store all the trunking *system* frequencies for EDACS in one channel storage bank, *and*
- Configure the channel storage bank ID list for the type of trunking system being monitored, *and*
- Enter ID codes into the ID memory for the bank
- For detailed trunked system programming instructions, see "Programming Trunked Systems" on Page 32 and "Storing Talkgroup IDs" on Page 38.

The control channels for some Motorola trunked radio systems may change on a day-to-day basis. To ensure that you will not miss traffic when the control channel changes, enter all the known control channel frequencies into the channel storage bank. If the control channel changes, your scanner will automatically lock on to the new control channel. If you do not know which system channels are used for the control channel operation, we recommend that you enter all the system frequencies into the same bank. ↙

When the scanner decodes the Motorola control channel and finds talkgroup activation on a voice channel, the scanner displays the control channel memory location on the top line, the received frequency with VC (voice channel) on the second line, the bank and control channel memory location number on the third line and the Motorola talkgroup ID number on the bottom line.!

Setting Squelch for Trunking

For optimal receiver performance when scanning both trunked and conventional systems, we recommend that you set the squelch close to threshold. Navigate to a programmed channel in manual mode. While the channel is idle, turn the squelch control fully counterclockwise. You will hear a loud rushing noise from the speaker. Turn the squelch control

NOTE

Frequency fleet map and talkgroup information are also widely available on the Internet. For example, at www.trunkscanner.com.

! IMPORTANT !

To listen to the transmission, the mode setting of the trunking control or system channels must match the mode setting of the associated ID list (MOT for Motorola and APCO-25, or ED for EDACS). 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 in the scanner's display. If not found, scanning resumes immediately unless the bank is in open trunking mode.

clockwise until the noise stops. You may find it necessary to set the control a bit further in the clockwise direction to prevent very weak signals or interference from stopping the scan operation.

Talkgroup ID Hold

You can set your scanner to follow a trunking signal that you want to track during scanning.

While the scanner is stopped on a voice channel (**VC** appears next to the frequency in the display), hold down **TRUNK** until **ID hold ON** appears in the scanner's display.

To manually activate ID hold mode on a selected ID, enter the ID list, scroll to the desired ID, then press **FUNC TRUNK**. The scanner will initiate ID hold operation on the selected talkgroup.

When ID hold is activated and the scanner receives a voice channel, the scan indication **S** at the first digit in the top line changes to **H** to indicate that the call is being monitored while the scanner is in ID hold.

To release ID hold, press **SCAN** or **TRUNK**.

Turning an ID Sub-Bank On or Off

Follow these steps to turn the ID sub-bank on or off during the program mode:

1. Press **TRUNK** repeatedly to select the desired sub-bank.
2. Press **FUNC** then **1** to toggle the sub-bank on or off. The

on/off state of the sub-bank will appear in the scanner's display.

Follow these steps to turn the ID sub-bank on or off during the scan mode:

1. The channel storage bank must be set to Closed Mode to change the state of a sub-bank while scanning.
2. Press **FUNC** and then **TRUNK** while the scanner is stopped on a voice channel transmission. The bank text display is replaced with a sub-bank status display, **T IDbk 01234**. The flashing cursor will indicate the current active sub-bank.
3. Press **FUNC** and the number of the sub-bank you wish to turn on or off (0-4). For example, to toggle sub-bank 4 on or off, press **FUNC**, then **4**.

Open and Closed Mode Operation

You can set your scanner to change the way it receives transmissions on Motorola, APCO-25 and EDACS trunked radio systems. These settings, called Open Mode and Closed Mode, control whether the scanner monitors all traffic from a trunked radio system, or only traffic from talkgroups you specify. Unlike the channel mode settings described above, Open/Close mode settings apply to a trunking system programmed into a single bank.

NOTE

In Open Mode, you hear all active talkgroups except those you specifically exclude, making it easy to hear everything going on. In Closed Mode, you hear only those talkgroups you specify. This makes it easy to listen only to talkgroups you are interested in and exclude others

Each scanner bank can be programmed with one trunked system. You can set each of the scanner's channel storage banks to Open or Closed Mode.

Conventional modes (AM, FM/Digital, CT and DC) are not affected by the Open/Closed Mode setting of a bank.

When you set a channel storage bank to Open Mode, + appears under the bank's number while scanning. When you set a channel storage bank to Closed Mode, - appears under the channel storage bank's number while scanning.

Traffic on locked out talkgroup IDs is ignored when the scanner is operating in Open and Closed Modes.

In Open Mode, the scanner will stop on all talkgroup traffic, except for traffic on talkgroups that are entered in the ID list and locked out. In Closed Mode, the scanner will only stop on talkgroup traffic if the ID is entered in the ID list and not locked out.

Open Mode scanning is useful in cases where you wish to monitor all traffic on the trunked system, except for certain talkgroups which you specify by entering them into the ID list and locking them out. Open Mode scanning allows you to search the trunking system for new or previously unknown talkgroup activity while ignoring traffic on undesired talkgroups.

Closed Mode scanning is useful in cases where you wish to restrict the traffic you monitor to a certain set of talkgroups only these talkgroups are specified in the ID list and not locked out.

Toggling Open and Closed Modes

To toggle Open or Closed Mode state for a bank, press **FUNC, 5** while stopped on a channel in the bank in SCAN, MAN or PGM modes. The scanner will briefly display **Bank OPEN** or **Bank CLOSED** to indicate the new Open or Closed state for the bank.

Manual ID Lockout Toggle

1. Press **PGM**.
2. Press **TRUNK**.
3. Press **FUNC**, and then **▲** or **▼** to move to the desired bank.
4. Press **▲** or **▼** to select the ID memory.
5. Press **L/OUT** to toggle the lock out status of the selected ID.

ACTIVATING ID LOCKOUT WHILE SCANNING

When scanning a trunked radio system in Open Mode, you can lock out a trunked ID by pressing **L/OUT** while the scanner is stopped on a voice call. If the ID has not been previously entered into the ID list for that bank, it will be added and locked out automatically.

When scanning a trunked radio system in Closed Mode, it is possible to lock out an ID by pressing **L/OUT** while the ID is active with a voice call.

Reviewing Locked-Out Talkgroup IDs

You can easily review and clear locked talkgroup IDs in the ID list. This process is similar to finding and clearing locked out conventional channels, except it is performed while in a trunked ID list.

1. Press **PGM** and then **TRUNK**.
2. Press **FUNC**, and then **L/OUT**. The first locked out ID in the ID list is displayed.
3. Press **L/OUT** to unlock the selected ID, or press **FUNC**, and then **L/OUT** again to continue reviewing locked IDs.

Changing from ID Text Tag Display to ID Code Display

By default, your scanner displays the stored alphanumeric text tag when receiving a trunked voice call. You can toggle the display to show the text tag or the talkgroup ID code by pressing **TEXT** while the scanner is stopped on a trunked talkgroup call.

TRUNKED DELAY FUNCTION

The trunking ID delay is set separately from the channel delay on a per channel storage bank

basis. Trunking ID delay specifies the amount of time the scanner dwells on the control channel looking for reply traffic on the previous talkgroup before resuming scan operation. Customizing the trunked ID delay may be useful if you are missing a lot of reply traffic on a particular system. We recommend starting with the default value of 2.0 seconds.

1. While in the desired ID list, press **FUNC**, and then **./DELAY**.
2. Press **▲** or **▼** to select None, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, or 4.0 seconds.
3. Press **ENTER**.💡

CLEARING TALKGROUP IDs

You can clear IDs from the ID list to make room for new IDs.

1. Press **PGM** and then **TRUNK**.
2. Press **FUNC**, **▲** or **▼** to select an ID memory.
3. Press **FUNC** and then **CLR** to clear the contents of the selected ID.

Clearing All Talkgroup IDs in One Bank

You can clear all talkgroup IDs within a bank. This lets you quickly delete all talkgroup IDs from a bank if you want to use the bank to store different data (such as a new set of talkgroup IDs).

💡 HINTS 💡

- Most Motorola trunking systems include a “hang time” where the channel remains assigned to a talkgroup for a short period after the user unkeys their microphone. This hang time is typically 1.5 seconds but can vary among different systems. The scanner’s trunked delay function begins after this hang time expires. Therefore, the total amount of delay present after a user unkeys their microphone equals the trunking system hang time, plus any trunked ID delay that you have programmed into the scanner. For example, if you wish to wait a total of two seconds for a reply trunked call, and the system you are monitoring is using 1.5 seconds of hang time, you should set the trunked delay for that system to 0.5 seconds. EDACS systems do not employ hang time.
- Conventional channel delay is fixed at 2 seconds and is controlled independently of trunked ID delay. Refer to “Using the Delay Function” on Page 66 for more information.

1. Press **PGM**.
2. Press **TRUNK** to enter a talk group ID memory mode.
3. Select a talkgroup ID bank using **FUNC**, **▲** or **▼**.
4. Press **FUNC** and then **6**. **Confirm list clear? 1=YES Press other key for NO.** appears in the scanner's display.
5. Press **1** to clear all talkgroup IDs within a bank. List cleared appears in the scanner's display.

To cancel the delete operation, press any key except **1**. The scanner returns to the talkgroup ID memory mode.

DIGITAL OPERATION

Your scanner is equipped with advanced Digital Signal Processing circuitry to receive and decode Phase 1 APCO-25 C4FM (four level FM) digital voice transmissions. This section of the manual will help you understand the differences between traditional analog and digital modulation.

For ease of use, your scanner is designed to automatically detect digital modulation on any conventional channel programmed for FM/Digital (FM) modulation. It is not necessary to configure individual channels for digital operation.

Many digital trunked radio systems are actually mixed mode systems

that support both analog and digital modulation. Certain user groups on these systems may use analog modulation, while others use digital modulation. Your scanner will automatically detect the type of modulation being used and switch to the correct modulation mode without special programming or user intervention.

Your scanner also features Intelligent Adaptive Digital Tracking for optimal reception of digital signals from a variety of digital conventional and trunked radio system types. No special sound quality settings or adjustments are needed for different C4FM system types.

Digital modulation represents a breakthrough in public safety communications technology. Digital modulation typically provides a clear, distortion free audio signal throughout the service area of the system you are monitoring. However, there are some important differences between analog and digital voice performance that you should be aware of while scanning.

In most cases, digital voice transmissions will be surprisingly crisp and clear, and without noise or distortion, even when corresponding analog signals from the same system contain some static. However, if you are in a location with marginal reception, you may find that the voice quality of digital signals deteriorates very rapidly, resulting in missing syllables or entire words. If this

happens, try reorienting the scanner or antenna for better reception. You may also try pressing the **ATT** key and apply attenuation to reduce the overload effects of nearby strong transmitters.

Under certain very weak digital signal conditions, the scanner may lose synchronization with the digital signal and briefly revert to analog FM, resulting in the reception of the raw, undecoded digital signal. This is a normal indication of a digital signal that is too weak to decode.

UPDATING THE DSP FIRMWARE

If necessary, the firmware for the DSP module can be updated by the user in the field by downloading a file from the Internet and transferring it to the scanner.

From time to time, improvements may be incorporated into the DSP firmware. These improvements will typically be designed to address issues that may be present with decoding the digital audio signals, and audio quality improvements. With updateable DSP firmware, you can ensure that your scanner is using the most recent DSP version available.

To update your scanner's DSP firmware, you will need the following items:

- The PC to scanner interface cable
- A personal computer running Windows 95 or greater
- A firmware update file from www.radioshack.com

Follow these steps to update your scanner's DSP firmware:

1. Go to <http://www.radioshack.com>
2. Click on the Support button.
3. Click on Scanner Firmware Downloads.
4. Click on PRO-96 DSP Firmware
5. Full download and upgrade instructions are provided on the Firmware Upgrade page.
6. To check the DSP version number, turn on the scanner and press **3** while **Welcome to Digital Trunking** appears in the scanner display. The scanner will display version information as follows:

Version
CPU: F1.0
DSP-App: F1.0
DSP-Voc: F1.0

The "CPU" and "DSP-Voc" firmware versions are permanently installed at time of manufacture and cannot be updated in the field. The "DSP-App" version is field upgradeable. The original factory version is indicated by "F" preceding the version number. The DSP-App version number will be preceded by "U" after the DSP version is updated via Internet download.

A GENERAL GUIDE TO FREQUENCIES

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.

US Weather Frequencies (in MHz)

162.400	162.425	162.450
162.475	162.500	162.525
162.550		

Ham Radio Frequencies

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
23-cm	1240.000 — 1300.000

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.

Birdie Frequencies

Every scanner has birdie frequencies. Birdies are signals created inside the scanner’s receiver. On rare occasions, birdies can cause interference to channels you want to listen to.

Birdies typically occur with approximately equal strength with and without the scanner's antenna attached. If you receive an interfering signal and suspect that it is a birdie, try removing the scanner's antenna. If the interference disappears, the interference may be the result of other electronic equipment in the vicinity of the scanner. If the interference remains, it is likely a birdie signal.

It may be possible to adjust the squelch control and/or attenuator to minimize the effects of a birdie signal on scanning operation. Both of these methods will likely have some effect on the signal you are trying to monitor as well.

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

30.7200	38.25000	41.89000	43.00500
51.00000	110.80000	125.95000	127.50000
129.01250	132.08750	134.20000	134.27500
135.16250	138.23000	140.25000	141.30500
146.0050	147.45000	148.95000	149.02500
152.99750	153.59000	154.10000	157.22000
159.93000	165.75000	216.85250	216.85750
219.99750	220.07250	221.18750	414.71875
414.72500	420.84375	431.47500	431.55000
440.81250	442.36875	451.00000	451.07500
451.15000	451.22500	459.52500	459.60000
470.01875	477.26250	484.37500	484.45000
489.52500	489.60000	489.67500	497.66250
812.70000	813.50000	816.08750	816.15000
820.2250	820.23125	852.96875	857.09375
867.20625	867.21875	867.22500	895.92500
912.38750	921.65000	921.72500	940.03125

940.9437	950.07500	950.15000	1244.16250
1251.30000	1251.37500	1262.59375	1268.77500
1271.80000	1282.10000	1282.17500	1282.25000
1282.32500	1299.46250		

Though your scanner's receiver is an advanced, triple conversion design engineered to minimize birdie interference, some birdie signals cannot be avoided and may impair your ability to monitor certain frequencies.

GUIDE TO THE ACTION BANDS

TYPICAL BAND USAGE (IN MHZ)

HF Band

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

VHF Band

Low Range	29.700–50.000
6-Meter Amateur	50.000–54.000
2-Meter Amateur	144.000–148.000
High Range	148.000–174.000

220 MHz Band

Narrow Band	220.000–222.000
1 1/4 – Meter Amateur	222.000–225.000

UHF Band

U.S. Government	406.000–420.000
70-cm Amateur	420.000–450.000
UHF-Low Band	450.000–470.000
UHF-T Band	470.000–512.000

800MHz Band

System Inputs	806.000–824.000
System Outputs	851.000–869.000
Trunked Private / General	894.000–960.000
25-cm Amateur	1240.000–1300.000

PRIMARY USAGE

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

VHF Band

Activities	Frequencies (MHz)
Government, Police and Fire	153.785–155.980
Emergency Services	158.730–159.460
Railroad	160.000–161.900
Land-Mobile “Paired” Frequencies	220.000–222.000

UHF Band

Activities	Frequencies (MHz)
Land-Mobile “Paired” Frequencies	450.000–470.000
Base Stations	451.025–454.950
Mobile Units	456.025–459.950
Repeater Units	460.025–464.975
Control Stations	465.025–469.975

Remote control stations and mobile/portable units operate at 5 MHz higher than their associated base stations and relay repeater units in the UHF band.

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.

Abbreviation	Service
AIR	Aircraft
BIFC	Boise (ID) Interagency Fire Cache
BUS	Business
CAP	Civil Air Patrol
CCA	Common Carrier
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, Forest Products)
MAR	Military Amateur Radio
MARI	Maritime Limited Coast (Coast Guard, Marine Telephone, Shipboard Radio, 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, Forestry Conservation)
PSB	Public Safety

Abbreviation	Service
PTR	Private Trunked
ROAD	Road & Highway Maintenance
RTV	Radio/TV Remote Broadcast Pickup
TAXI	Taxi Services
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) —
(3 MHz-30 MHz)**

CB Band
(26.965-27.405 MHz)

10-Meter Amateur Band
(28.0-29.7 MHz)

28.000-29.700 HAM

**VERY HIGH FREQUENCY (VHF)
— (30 MHz-300 MHz)**

VHF Low Band
(29.7-50 MHz-in 5 kHz steps)

29.700-29.790..... IND
 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
 36.230-36.990..... Oil Spill Cleanup,
 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)**

50.00-54.00..... HAM

Aircraft Band (108-136 MHz)

108.000-121.490..... AIR
 121.500.....AIR Emergency
 121.510-136.000..... AIR

**U.S. Government Band
 (137-144 MHz)**

137.000-144.000..... GOVT, MIL

**2-Meter Amateur Band
 (144-148 MHz)**

144.000-148.000..... HAM

VHF High Band (148-174 MHz)

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
 152.270-152.480.....IND, TAXI, BUS
 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
 158.130-158.460.....BUS, IND, OIL,
TELM, UTIL
 158.730-159.465..... POL, PUB, ROAD
 159.480..... OIL
 159.495-161.565..... TRAN
 161.580-162.000..... OIL, MARI, RTV
 162.0125-162.35.... 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
 169.55-169.9875... 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
 173.60-173.9875..... GOVT

**ULTRA HIGH FREQUENCY
(UHF) — (300 MHz-3 GHz)**

U. S. Government Band (406-420 MHz)

406.125-419.975..... GOVT, USXX

70-Centimeter Amateur Band
(420-450 MHz)

420.000-450.000 HAM

Low Band (450-470 MHz)

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
 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)

(Channels 14 through 20 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

Conventional Systems Band —
Locally Assigned (in 6.25 kHz steps)

Frequency Range	Service
851.0125–855.9875 MHz	CSB

Conventional/Trunked Systems
Band —

Locally Assigned
(in 6.25 kHz steps)

Frequency Range	Service
856.0125–860.9875 MHz	CTSB

Trunked Systems Band —
Locally Assigned
(in 6.25 kHz steps)

Frequency Range	Service
861.0125–865.9875 MHz	TSB

Public Safety Band —
Locally Assigned
(in 6.25 kHz steps)

Frequency Range	Service
866.0125–868.9875 MHz	PSB

33-Centimeter Amateur Band
(902-928 MHz in 6.25 kHz steps)

Frequency Range	Service
902.000–928.000 MHz	HAM

Private Trunked Band (in 6.25 kHz
steps)

Frequency Range	Service
935.0125–939.9875 MHz	PTR

General Trunked Band (in 6.25
kHz steps)

Frequency Range	Service
940.0125–940.9875 MHz	GTR

23-Centimeter Amateur Band (in
6.25 kHz steps)

Frequency Range	Service
1240.000–1300.000 MHz	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:

$$30.62 \text{ (MHz)} \times 1,000 = 30,620 \text{ kHz}$$

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

$$127.800 \text{ (kHz)} / 1,000 = 127.8 \text{ MHz}$$

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

$$300/50 \text{ MHz} = 6 \text{ meters}$$

TROUBLESHOOTING

If you have problems with your scanner, please refer to the following chart for some suggestions that might help you eliminate the problem. If the scanner is still not operating correctly after trying these tips, take your scanner to your local RadioShack store for assistance.

TROUBLESHOOTING CHART

Problem	Possible Caus	Remedy
Poor reception	Weak signals from distant stations	Reposition radio for best reception.
	Attenuator is in use on weak signals.	Check performance with and without attenuator activated, use setting with best reception.
	Strong signal overload from nearby transmitter(s)	Check performance with and without attenuator activated, use setting with best reception.
Scanner will not power on	AC or DC power supply is not properly connected.	Check connection to AC or DC power source.
	Dead batteries	Replace batteries.
The keypad does not work	Keypad lock is activated.	Press FUNC LOCK to disable keypad lock.
	The scanner may need to be reset or initialized.	See "Resetting / Initializing the Scanner" on Page 108.
Scanner will not scan when SCAN is pressed.	Possible "birdie" frequency programmed	Tighten squelch, apply attenuator or lock out the "birdie" frequency.
	The scanner may need to be reset or initialized.	See "Resetting / Initializing the Scanner" on Page 108.
	No channels programmed, or only one channel programmed, or all channels locked out	Ensure that the scanner has more than one channel programmed and enabled for scanning.
	SQUELCH is not adjusted properly.	Turn SQUELCH clockwise until scanning resumes.

Problem	Possible Caus	Remedy
The scanner does not receive digital transmissions on digital frequencies or trunking systems	The digital channel or talkgroup is not using APCO-25 digital modulation	The scanner can only receive APCO-25 C4FM IMBE digital signals.
	The digital channel or talkgroup is encrypted	The scanner will not receive encrypted traffic.
	The digital channel or talkgroup is being transmitted from a distant location	Reposition the scanner or use an outdoor antenna to improve reception.

! 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.


You may be able to save the information in your scanner's memory into your computer, a V-Scanner folder or another scanner before trying to initialize it. See "Cloning the Programmed Data" on Page 82 and "Working with V-Scanners" on Page 75.

Initialilzing the Scanner clears all information you stored in the scanner's working memory. Initialize the scanner only when you are sure the scanner is not working properly. V-Scanner memory is not affected when the scanner is initialized.


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.!

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. 

Initializing the Scanner

1. Turn off the scanner, then turn it on again. !The scanner briefly displays the DSP boot version, and then **Welcome To Digital Trunking** appears. 
2. Press **0**. The scanner displays:

System Tests

Select Test

Exits if no
Key Press

3. Press 1. The scanner displays:

Factory Init
Erase Memory
ENTER if Yes
CL to Exit

4. Press **ENTER**. The scanner displays:

Initializing
Clr Main Mem
V-Scan is OK
Please Wait

CARE

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 carefully; do not drop it. Keep the scanner away from dust and dirt, and wipe it with a damp cloth occasionally to keep it looking new.

SERVICE AND REPAIR

If your scanner is not performing as it should, take it to your local RadioShack store for assistance. To locate your nearest RadioShack, use the store locator feature on RadioShack's website (www.radioshack.com), or call 1-800-The Shack (843-7422) and follow the menu options. Modifying

NOTE **Resetting the Scanner**

Pressing the reset button does not clear the scanner's working memory or the V-Scanner folders.

Initializing the Scanner

- Do not turn off the scanner until the initialization is complete. When the initialization is complete, **m000** appears on the top line of the display. **Bank 0 Ch 00** appears on the bottom line.
- It may be possible to save your working memory to a V-Scanner folder prior to performing initialization. See "Working with V-Scanners" on Page 75.

or tampering with the [product]'s internal components can cause a malfunction and might invalidate its warranty and void your FCC authorization to operate it.

SPECIFICATIONS

Frequency Coverage:

Frequency Range (MHz)	Programming/Search Step Value
25–54	5 kHz
108–136.9875	12.5 kHz
137–174	5, 6.25 or 7.5 kHz
216.0025–221.9975	5 kHz
222.0000 –225.0000	5 kHz
406–512	6.25 kHz
806–823.9875	6.25 kHz
849–868.9875	6.25 kHz
894–960	6.25 kHz
1240–1300	6.25 kHz

Memory Organization :

V-Scanners..... eleven 500 channel virtual scanners
 Memory channels 500
 Channel storage banks 10
 Number of channels per channel storage bank..... 50
 Talkgroup ID memories 1500
 ID memory banks 10
 Sub-banks per bank 5
 Number of memory IDs per sub-bank 30

Sensitivity (20 dB S/N):

FM:

25–54 MHz 0.3 μ V
 108–136.9875 MHz 0.3 μ V
 137–174 MHz 0.5 μ V
 216–225 MHz 0.5 μ V
 406–512 MHz 0.5 μ V
 806–960 MHz 0.7 μ V

1240–1300 MHz 0.7 μ V

AM:

25–54 MHz 1 μ V

108–136.9875 MHz 1 μ V

137–174 MHz 1.5 μ V

216–225 MHz 1.5 μ V

406–512 MHz 2 μ V

806–960 MHz 2 μ V

1240–1300 MHz 3 μ V

Selectivity:

25 – 27.995 MHz in AM mode

-6 dB +/-5 kHz

-50 dB +/-6 kHz

All frequencies at AM and FM mode except 25 – 27.995 MHz at AM

-6 dB +/-10 kHz

-50 dB +/-18 kHz

IF Rejection

380.8 MHz at 154.1 MHz 60 dB

21.4 MHz at 154.1 MHz 100 dB

Spurious Rejection

(at 154.1 MHz FM) 40 dB

Scanning Speed and Delay

Scanning Rate Up to 60 Channels per Second

Search Rate Up to 75 Steps per Second

Conventional Channel Delay Time 2 seconds

Priority Sampling 2 seconds

Trunking Talkgroup Delay Time User configurable

Intermediate Frequencies (IF):

1st 380.8 MHz

2nd 21.4 MHz

3rd 455 kHz

Squelch Sensitivity:

Threshold (FM and AM) 0.5 μ V

Tight (FM) 25 dB

Tight (AM) 20 dB

Antenna Impedance 50 Ohms

Audio Output Power (10% THD)170 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 Batteries
External Power9 V/300 mA DC
Current Drain (Squelched) 90 mA
Battery Charge Current 150 mA

Physical

Dimensions (HWD)6 3/16 × 2 7/16 × 1 3/4 inches
.....(157 × 62 × 41 mm)
Weight (without antenna and batteries)..... 8.8 oz. (250 g)
Operating Temperature14 to 140° F (-10 to 60° C)

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

COMMAND QUICK REFERENCE GUIDE

Scan Mode

Keystrokes	Function
SCAN	Activates Scan Mode, resumes scan when stopped on a channel or talkgroup.
MAN	If scanning or monitoring a trunked call, stops scan operation, activates Manual Mode. If monitoring conventional call, stops scan operation, activates Manual Mode, holds on active channel.
PGM	If scanning or monitoring a trunked call, stops scan operation, activates Program Mode. If monitoring conventional call, stops scan operation, activates Program Mode, holds on active channel.
WX	Activates Weather Mode
TRUNK	If monitoring a trunking talkgroup, stores the ID into the next available ID list memory location.
TRUNK (hold)	If monitoring a trunking talkgroup, activates ID Hold Mode, scanner holds on the active talkgroup.
PRI	Toggles priority.
TUNE	Enters Tune Mode.
ATT	Toggles attenuation for active channel, or, if global attenuation is set, toggles global attenuation on or off.
TEXT	If monitoring a trunking talkgroup, toggles talkgroup alphanumeric text tag or trunking ID display.
L/OUT	If monitoring a trunking talkgroup, locks out the active talkgroup so it will not be monitored. If monitoring a conventional channel, locks out the active channel so it will not be monitored.
MODE	If monitoring a conventional channel, cycles through the valid modes, clears any stored CT or DC code.
SRCH	Activates Search Mode.
NUMBER KEYS 0-9	Toggle scan banks on or off.
DECIMAL POINT	When monitoring a conventional channel, toggles delay for that channel on or off.

Keystrokes	Function
ENTER	When monitoring a conventional channel that is programmed for CT or DC Search Mode, stores a detected CT or DC code with the channel memory.
▲ or ▼	Changes scan direction, up or down.
FUNC + MAN	Toggles digital AGC
FUNC + TRUNK	When monitoring a talkgroup call, toggles display of control channel text tag or Trunked ID sub-bank status.
FUNC + PRI	If monitoring a conventional channel, stores the frequency into the priority channel.
FUNC + TUNE	If monitoring a conventional channel, stores the frequency into the tune memory.
FUNC + ATT	Toggles attenuator mode, normal or global.
FUNC + 5	Toggles open or closed mode for current bank.
FUNC + 0-4	When Trunked ID sub-bank display is active, and while monitoring a talkgroup call, toggles ID sub banks 0-4 on or off.

Manual Mode

Keystrokes	Function
SCAN	Activates Scan Mode.
MAN	Increments to the next channel memory.
PGM	Activates Program Mode.
WX	Activates Weather Mode .
PRI	Toggles priority.
TUNE	Enters Tune Mode.
ATT	Toggles attenuation for selected channel, or, if global attenuation is set, toggles global attenuation on or off.
L/OUT	Toggles lockout on the selected channel.
MODE	Cycles through valid modes for the selected channel, clears any stored CT or DC settings.
SRCH	Activates Search Mode.
2, 3, MAN	Jumps to channel 23 in the current bank.
1, 2, 3, MAN	Jumps to bank 1, channel 23.
DECIMAL POINT	Toggles delay on selected channel on or off.

Keystrokes	Function
ENTER	When monitoring a conventional channel that is programmed for CT or DC Search Mode, stores a detected CT or DC code with the channel memory.
▲ or ▼	▲ steps to the next channel, ▼ steps to the previous channel. Hold down to scroll.
FUNC + MAN	Toggles digital AGC.
FUNC + TRUNK	Enters trunked ID list for current bank.
FUNC + PRI	Stores the frequency of the selected channel into the priority channel.
FUNC + TUNE	Stores the frequency of the selected channel frequency into the tune memory.
FUNC + ATT	Toggles attenuator mode, normal or global.
FUNC + 5	Toggles open or closed mode for current bank.
FUNC + 9	Adjust display contrast, use ▲ or ▼ then ENTER.
FUNC + L/OUT	Jumps to the next locked out channel.
FUNC + ▲ or ▼	▲ jumps forward to the next bank, ▼ jumps to the previous bank. Hold down to scroll.

Program Mode

Keystrokes	Function
SCAN	Activates Scan Mode.
MAN	Activates Manual Mode.
PGM	Increments to the next channel memory.
WX	Activates Weather Mode.
PRI	Selects priority channel for programming.
TEXT	Edits text tag for selected channel.
TRUNK	Enters ID List Edit for the selected bank.
TUNE	Enters Tune Mode.
ATT	Toggles attenuation for selected channel, or, if global attenuation is set, toggles global attenuation on or off.
L/OUT	Toggles lockout on the selected channel.
MODE	Cycles through valid modes for the selected channel, clears any stored CT or DC settings.

Keystrokes	Function
SRCH	Sets search range for programmable search range (PSR).
2, 3, PGM	Jumps to channel 23 in the current bank.
1, 2, 3, PGM	Jumps to bank 1, channel 23.
DECIMAL POINT	Toggles delay on selected channel on or off.
<frequency> ENTER	Enters a frequency into channel memory.
▲ or ▼	▲ steps to the next channel, ▼ steps to the previous channel, hold down to scroll.
FUNC + MAN	Toggles digital AGC.
FUNC + MODE	If selected channel mode is set to CT or DC, edits CT or DC code.
FUNC + PRI	Stores the frequency of the selected channel into the priority channel.
FUNC + TUNE	Stores the frequency of the selected channel frequency into the tune memory.
FUNC + ATT	Toggles attenuator mode, normal or global.
FUNC CLR	Clears all programming data in selected channel.
FUNC + 5	Toggles open or closed mode for current bank.
FUNC + 7	Edits bank text tag.
FUNC + L/OUT	Jumps to the next locked out channel.
FUNC + TEXT	Edits welcome screen line 4 (stored with V-Scanner as folder name).
FUNC + PGM	Enters V-Scanner function menu.
FUNC + ▲ or ▼	▲ jumps forward to the next bank, ▼ jumps to the previous bank. Hold down to scroll.

Search Mode

Keystrokes	Function
SCAN	Activates Scan Mode.
MAN	Activates Manual Mode.
PGM	Activates Program Mode.
WX	Activates Weather Mode.
PRI	Toggles priority.
TUNE	Enters Tune Mode.
ATT	Toggles attenuation for active search range, or, if global attenuation is set, toggles global attenuation on or off.
L/OUT	Locks out undesired search frequencies or search channels.
PAUSE	Pauses and resumes search operations.
MODE	Cycles through AM/FM/CT/DC modes for selected search range.
SRCH	Steps through the available search ranges.
DECIMAL POINT	Toggles delay on or off in selected search range or search channel.
▲ or ▼	Changes search direction.
FUNC + MAN	Toggles digital AGC.
FUNC + PRI	When searching SR1 to SR6, stores active search frequency in priority memory.
FUNC + TUNE	When searching SR3, SR4, SR5 and SR6, stores active search frequency in tune memory.
FUNC + ATT	Toggles attenuator mode, normal or global.
FUNC + L/OUT	In SR0, SR1, SR2, steps to next locked out search channel, must be in "M" state. In SR3, SR4, SR5 and SR6, enters Search Lockout Review. Use arrow keys to review locked frequencies, use CLR to clear locked frequencies, use FUNC + 6 to clear all locked frequencies.
FUNC + MODE	Sets mode to default for active search range.
FUNC + SRCH	Toggles Manual Channel Select or Search Channels for SR0, SR1 and SR2.

Keystrokes	Function
FUNC + PGM	When searching SR3, SR4, SR5 and SR6, stores active search frequency in desired bank and channel (e.g., "123 + ENTER" stores the active frequency in Bank 1, Channel 23).
FUNC + ENTER	When searching SR3, SR4, SR5 and SR6, stores active search frequency in next available channel in desired bank (e.g., "1 + ENTER" stores active frequency in next empty channel in Bank 1).
FUNC + 7	Toggles Seek on or off.
FUNC + 0	Toggles Zeromatic on or off.

Weather Mode

Keystrokes	Function
SCAN	Activates Scan Mode.
MAN	Activates Manual Mode.
PGM	Activates Program Mode.
WX	Steps to next weather channel.
WX, and then hold WX	Weather alert alarm demonstration. Press any key to exit.
TUNE	Enters Tune Mode.
ATT	Toggles attenuation for selected weather frequency, or, if global attenuation is set, toggles global attenuation on or off.
SRCH	Enters Search Mode.
NUMBER KEYS 0-9	Quick FIPS code review for FIPS memories 0-9. Press L/OUT to toggle lockout status.
FUNC + PRI	Stores active weather frequency in priority memory. Press PRI in Scan, Search, Manual, Program modes to activate WX Priority.
FUNC + ATT	Toggles attenuator mode, normal or global.
FUNC + PGM	FIPS code entry - Use ▲ or ▼ to scroll, key in FIPS code + ENTER to store. Press L/OUT to toggle lockout of FIPS code, press TEXT and enter text label for FIPS memory. Press WX to exit.
FUNC + WX	Activates FIPS/SAME weather alert mode. Press FUNC + WX to exit.

Tune Mode

Keystrokes	Function
SCAN	Activates Scan Mode.
MAN	Activates Manual Mode.
PGM	Activates Program Mode.
WX	Activates Weather Mode.
PRI	Toggles priority.
ATT	Toggles attenuation for active search range, or, if global attenuation is set, toggles global attenuation on or off.
PAUSE	Pauses and resumes tune operations.
MODE	Cycles through AM/FM/CT/DC modes.
SRCH	Activates Search Mode
DECIMAL POINT	Toggle tune delay on or off.
▲ or ▼	Changes tune direction, resumes tune operation after stopping on an active frequency.
FUNC + MAN	Toggles digital AGC.
FUNC + PRI	Stores active tune frequency in priority memory.
FUNC + ATT	Toggles attenuator mode, normal or global.
FUNC + MODE	Sets mode to default for active search range.
FUNC + PGM	Stores active tune frequency in desired bank and channel (e.g., "123 + ENTER" stores the active frequency in Bank 1, Channel 23).
FUNC + ENTER	Stores active tune frequency in next available channel in desired bank (e.g., "1 + ENTER" stores active frequency in next empty channel in Bank 1).


ID List Edit

Keystrokes	Function
SCAN	Activates Scan Mode.
MAN	Activates Manual Mode.
PGM	Activates Program Mode.
WX	Activates Weather Mode.
TEXT	Edits text tag for selected ID.

Keystrokes	Function
TRUNK	Steps to first ID in next ID sub bank.
TUNE	Enters Tune Mode.
L/OUT	Toggles lockout on the selected ID.
MODE	Cycles trunking mode through MO, ED and "not trunked".
SRCH	Activates Search Mode.
<id> ENTER	Stores ID into selected location.
▲ or ▼	▲ steps to the next ID, ▼ steps to the previous ID, hold down to scroll.
FUNC + MAN	Toggles digital AGC.
FUNC + DECIMAL POINT	Selects ID delay duration for selected bank.
FUNC CLR	Clears all programming data in selected ID.
FUNC + 1	Toggles active sub bank on or off.
FUNC + 2	Base/offset/step table entry for Motorola, toggles AFS or Decimal display for EDACS.
FUNC + 3	Motorola 3600 control channel mode select.
FUNC + 4	Motorola/P25 9600 control channel mode select.
FUNC + 6	Clears all ID entries in current ID list.
FUNC + 8	Sets Motorola Type I fleetmap.
FUNC + L/OUT	Jumps to the next locked out ID.
FUNC + TRUNK	Launches ID hold mode on selected ID.
FUNC + PGM	Enters V-Scanner function menu.
FUNC + ▲ or ▼	▲ jumps forward to the next ID bank, ▼ jumps to the previous ID bank. Hold down to scroll.

Startup keys

(Enter during welcome screen display.)

Keystrokes	Function
1	Turns key tones on.
2	Turns key tones off.
3	Displays CPU, DSP application and DSP vocoder versions.
	Adjust backlight properties.
0 then 1	Destructive - Initializes working memory to factory defaults. Does not affect V-Scanner memory.
0 then 2	Destructive - Loads test frequencies into working memory. Does not affect V-Scanner memory.
0 then 5	Destructive / EEPROM memory test #1 - Initializes working memory. Does not affect V-Scanner memory.
0 then 6	Destructive / EEPROM memory test #2 - Initializes working memory. Does not affect V-Scanner memory.
0 then PGM	Upgrade DSP application firmware.
0 then TEXT	DSP factory tests
0 then CLR	Destructive - Reverts to factory DSP application version, any DSP upgrades are lost.

NOTES

NOTES

Limited One-Year Warranty

This product is warranted by RadioShack against manufacturing defects in material and workmanship under normal use for one (1) year from the date of purchase from RadioShack company-owned stores and authorized RadioShack franchisees and dealers. EXCEPT AS PROVIDED HEREIN, RadioShack MAKES NO EXPRESS WARRANTIES AND ANY IMPLIED WARRANTIES, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE DURATION OF THE WRITTEN LIMITED WARRANTIES CONTAINED HEREIN. EXCEPT AS PROVIDED HEREIN, RadioShack SHALL HAVE NO LIABILITY OR RESPONSIBILITY TO CUSTOMER OR ANY OTHER PERSON OR ENTITY WITH RESPECT TO ANY LIABILITY, LOSS OR DAMAGE CAUSED DIRECTLY OR INDIRECTLY BY USE OR PERFORMANCE OF THE PRODUCT OR ARISING OUT OF ANY BREACH OF THIS WARRANTY, INCLUDING, BUT NOT LIMITED TO, ANY DAMAGES RESULTING FROM INCONVENIENCE, LOSS OF TIME, DATA, PROPERTY, REVENUE, OR PROFIT OR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, EVEN IF RadioShack HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

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This warranty does not cover: (a) damage or failure caused by or attributable to acts of God, abuse, accident, misuse, improper or abnormal usage, failure to follow instructions, improper installation or maintenance, alteration, lightning or other incidence of excess voltage or current; (b) any repairs other than those provided by a RadioShack Authorized Service Facility; (c) consumables such as fuses or batteries; (d) cosmetic damage; (e) transportation, shipping or insurance costs; or (f) costs of product removal, installation, set-up service adjustment or reinstallation.

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