PRO-95 Dual Trunk-Tracking Handheld Scanner

20-525 OWNER'S MANUAL — Please read before using this equipment.

! 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
— Caution
! — Important
— Hint
— **Note**

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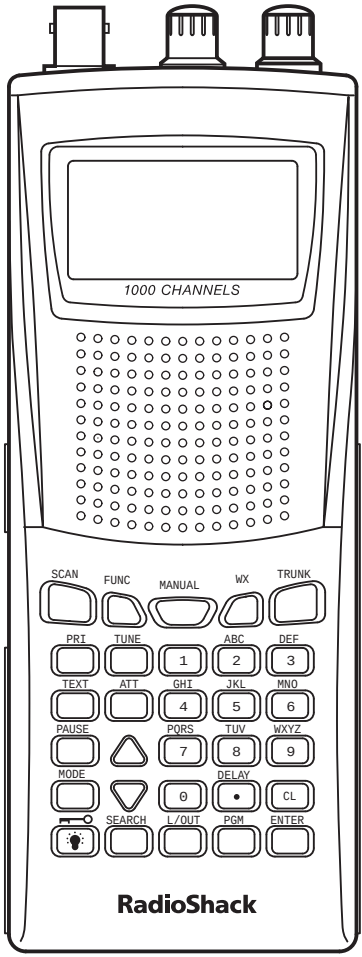

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FEATURES

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

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

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

The scanner also lets you scan conventional transmissions, and is preprogrammed with service search banks for convenience. By pressing a single button, you can quickly search those frequencies

most commonly used by public service and other agencies.

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

Your scanner includes these features:

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

Automatic Channel Programming — automatically determines the group trunking frequencies, for Motorola trunking systems only, once the control channels are programmed.

10 Channel-Storage Banks — let you store 100 channels in each bank (1,000 channels) to group channels so calls are easier to identify.

10 ID-Storage Banks — let you store 1,000 IDs in 10 ID banks that have 5 sub-ID banks. 20 IDs are programmed in each sub-ID bank and let you easily identify the ID code.

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

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

Data Cloning — lets you transfer the programmed data to another PRO-95, PRO-93, or PRO-2053 scanner. You can also upload or download the programmed data to or from a PC using an optional PC interface kit.

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.

Priority Channel — lets you set the scanner to check one channel every 2 seconds so you do not miss transmissions.

Attenuate — lets you program your scanner to reduce the scanner's sensitivity to strong local signals, to reduce interference or noise caused by these signals.

Text Input — lets you input a text label for each channel, talk group ID, bank, or other memory location so you can easily 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.

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).

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

Your scanner can receive these frequencies:

- 25 – 54 MHz
- 108 – 136.9875 MHz
- 137 – 174 MHz
- 216.0025 – 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 69 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:

1. This device may not cause harmful interference.
2. 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.

We encourage responsible, legal scanner use.

In some areas, mobile use of this scanner is unlawful or requires a permit. Check the laws in your area.

PREPARATION

Power Sources

You can power your scanner from any of three sources:

- internal non-rechargeable batteries or rechargeable batteries (not supplied — see “Using Batteries”).
- standard AC power (with an optional AC adapter — see “Using AC Power” on Page 11)
- vehicle power (with an optional DC adapter — see “Using Vehicle Battery Power” on Page 12)

Using Batteries

You can power the scanner with four AA batteries (not supplied). For the longest operation and best performance, we recommend alkaline batteries, available at your local RadioShack store.

You can use either the supplied non-rechargeable battery holder (black), or the supplied rechargeable battery holder (yellow). If you use the rechargeable battery holder, we recommend RadioShack nickel-metal hydride (Ni–MH) batteries.

NOTE

- Connecting an AC or DC adapter to the scanner disconnects internal batteries when you use the supplied non-rechargeable battery holder, but it does not disconnect internal batteries when you use the supplied rechargeable battery holder.
- If you install the rechargeable battery holder, you can operate the scanner and recharge the rechargeable batteries at the same time. See “Using Batteries” and “Charging Rechargeable Batteries” on Page 11.
- If the scanner stops working properly after connecting it to power, try resetting it. See “Resetting/ Initializing the Scanner” on Page 83.
- You must charge rechargeable batteries before you use them the first time. See “Charging Rechargeable Batteries” on Page 11.

⚠ 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.

CAUTION

- The battery holder fits only one way. Do not force it.
- Use only fresh batteries of the required size and recommended type.
- Always remove old or weak batteries. Batteries can leak chemicals that destroy electronic circuits.
- Do not mix old and new batteries, different types of batteries (alkaline or rechargeable), or rechargeable batteries of different capacities.
- If you do not plan to use the scanner with batteries for a month or longer, remove the batteries. Batteries can leak chemicals that can destroy electronic parts.

You must charge rechargeable batteries before you use them the first time. See “Charging Rechargeable Batteries” on Page 11. ⚠

Follow these steps to install the batteries:

1. Press in on 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!** appears and the scanner beeps continuously. When battery power is depleted, the scanner turns itself off. Replace all four non-rechargeable batteries, or recharge the rechargeable batteries. See “Charging Rechargeable Batteries” on Page 11. ⚠

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) 1500mAh batteries.

To charge batteries with a DC adapter from a DC power source, you must use a 9V, 300 mA DC adapter 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 1600mAh 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.

WARNING

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

CAUTION

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

NOTE

- The scanner can also charge Ni-Cd batteries. 600mAh batteries require 6 hours and 850mAh 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. Then fully charge the rechargeable batteries.

CAUTION

You must use a Class 2 power source that supplies 9V DC and delivers at least 300 mA. Its center tip must be set to positive and its plug must fit the scanner's **PWR DC 9V** jack. Using an adapter that does not meet these specifications could damage the scanner or the adapter.

- Always connect the AC or DC adapter to the scanner before you connect it to AC power or power source. When you finish, disconnect the adapter from AC power or the power source before you disconnect it from the scanner.

NOTE

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.

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.

Connecting the 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 tabs 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 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 lengths over 50 feet, use RG-8 low-loss dielectric coaxial cable. If your antenna's cable does not have a BNC connector, you will also need a BNC adapter (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. ⚠

⚠ 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.

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 🎧 jack on top of your scanner. This automatically disconnects the internal speaker.

Listening Safely

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

- Set the volume to zero before putting on the 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 could be illegal in some 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!

Connecting an Extension Speaker

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

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

Using the Belt Clip

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

Transferring Data to and from Another Scanner or a PC

You can transfer the programmed data to and from another PRO-95, PRO-93, or PRO-2053 scanner using a connecting cable which has 1/8-inch phone plugs on both ends (not supplied). Connect the cable between each scanner's **PC/IF** jacks. See “Cloning the Programmed Data” on Page 53. You can also upload or download the programmed data to or from a PC using an optional PC interface kit available through your local RadioShack store.

About Your Scanner

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

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

You can also search the SEARCH banks, which are preprogrammed frequencies in the scanner's memory (see “Searching a Preprogrammed Frequency Range” on Page 32 for the frequency list). You can even change the frequency range on one of the SEARCH banks (SR5) to limit the search.

When you find a frequency, you can store it into a programmable memory location called a *channel*, which is grouped with other channels in a channel-storage bank. You can then scan the channel-storage banks to see if there is activity on the frequencies stored there. Each time the scanner finds an active frequency, it stays on that channel until the transmission ends.

ABOUT THE KEYPAD

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

SCAN — scans through the programmed channels.

FUNC (function) — lets you use various functions by pressing this key in combination with other keys.

MANUAL — 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 (Priority) — sets and turns the priority function on or off.

TEXT — lets you input text.

PAUSE — stops search.

MODE — changes the receive mode (AM, FM, MOT, ED).

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

TUNE — lets you input a frequency and allows you to fine tune a frequency along with ▲ or ▼ .

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

▲ or ▼ — selects the scan or search direction.

SEARCH — lets you search the six search banks.

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

PGM — programs frequencies into channels.

ENTER — 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 ., -, #, _, @, +, *, &, /, ', $, %, !, ^, (,), ?, ->, ` or <-.

./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).

CL — clears an incorrect entry.

QUICK START

To help familiarize yourself with the scanner's functions, keypad, and available frequencies, you can utilize one of these three features before you begin programming the scanner.

Preprogrammed Search Banks — allow you to listen to frequencies and decide which frequencies you want to store when you are ready to program the scanner. See "Searching a Preprogrammed Frequency Range" on Page 32.

Manual Tuning — allows you to manually scan through the entire range of available frequencies without programming. (See "Specifications" on Page 84 for a list of the available frequency ranges.) Also, see "Deleting Frequencies from Channels" on Page 44.

Weather Radio — allows you to listen to NOAA weather broadcasts without programming. See "Listening to the Weather Band" on Page 39.

UNDERSTANDING BANKS

CHANNEL STORAGE BANKS

A bank is a storage area for a group of channels. Channels are storage areas for frequencies. Whereas a channel can only contain one frequency, a bank can hold numerous 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 100 (00 to 99) channels each, a total of 1,000 channels. You can use each channel-storage bank to group frequencies, such as those used by Motorola trunking, EDACS trunking, Marine, CB, Police, Fire, Aircraft and Ham (see “Typical Band Usage (in MHz)” on Page 71).

For example, a police department might use four frequencies, one for each side of town. 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). The first digit identifies the bank (0 to 9). The second and third digits identify the channel within the bank (00 to 99).

NOTE
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.

Search Banks

Your scanner has five preprogrammed search banks and one limit search bank. You can set the lower and higher frequency limit in the limit search bank.

For the default setting, see “Searching a Preprogrammed Frequency Range” on Page 32).

UNDERSTANDING YOUR SCANNER'S MODES

You can program each channel with any of four receive modes (AM, FM, MOT, and ED).

However, you cannot program MOT (Motorola), or ED (EDACS) mode in VHF. Each receive mode affects how your scanner operates when scanning and receiving transmissions, and also affects what transmissions you receive when you set the scanner to the closed mode. See “Changing the Receive Mode” on Page 49.

NOTE
Your scanner’s closed mode lets you hear only those talk groups you specify. For more information, see “Open and Closed Modes” on Page 25.

AM Mode

The AM mode sets the scanner to receive transmissions using amplitude modulation (AM), primarily used for aircraft, military, some amateur radio, and some government transmissions. (Refer to “Specifications” on Page 84 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 Mode

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

Motorola Mode

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

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

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

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

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

FFF=Fleet ID

SS=Subfleet ID

Type I systems are usually organized with different user groups assigned to different fleets.

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

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

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

EDACS Mode

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

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

EDACS frequencies are organized in a specific order. Each frequency

NOTE

Motorola Mode
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.

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

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

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

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

Open and Closed Modes

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

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

In open mode, the scanner scans signals transmitted in all systems. The scanner stops on any ID code and only uses the ID list to look up ID text tags.

In closed mode, the scanner stops only on signals that have an ID code which is found in the ID list for the bank. Also, the scanner scans signals transmitted only under the following conditions:

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

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

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

NOTE

- In open mode, you hear all active talk groups except those you specifically exclude, making it easy to hear everything going on. In closed mode, you hear only those talk groups you specify. This makes it easy to listen only to talk groups you are interested in and exclude others.
- When you select a channel manually, any transmission opens squelch, regardless of the current mode.

storage bank's number while scanning. **OPEN** or **CLOSED** appears while the scanner is in manual mode or while the scanner is receiving a signal during scanning. See “Changing the Open/Closed Mode” on Page 68 for more information about setting the open and closed modes.

NOTE

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

OPERATION

Turning on the Scanner and Setting Squelch

1. To turn on the scanner, turn **VOLUME** clockwise. **Welcome To Dual Trunking** appears. After about 3 seconds, you might hear a hissing sound. Then adjust **VOLUME** to a comfortable listening level.

2. Turn **SQUELCH** fully counterclockwise until the indicator points to **MIN**, then turn **SQUELCH** clockwise until the hissing sound stops.

3. To turn off the scanner, turn **VOLUME** counterclockwise to **OFF**.

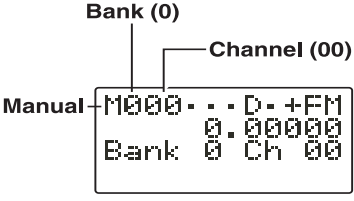
Storing Known Frequencies into Channels

Good references for active frequencies are *RadioShack's Police Call, Aeronautical Frequency Directory*, and *Maritime Frequency Directory*. We update these directories every year, so be

sure to get a current copy. Also see the supplied *Trunking Guide*.

Follow these steps to store frequencies into channels.

1. Press **MANUAL**, enter the bank (0–9) and channel number (00–99) where you want to store a frequency, then press **MANUAL** again. **m** and the bank and channel number appear at the upper left corner of the display (for example: **m000**).



   - Press **FUNC**. Then press ▲ or ▼. The bank number moves in the direction of the arrow pressed.
   - Press **FUNC**. Then hold down ▲ or ▼. The bank number moves continuously in the assigned direction.
   - Press ▲. The channel number moves upward one by one. Or, press ▼. The channel number moves downward one by one.

2. Press **PGM**. **m** changes to **P**.

3. Use the number keys and **./DELAY** to enter the fre-

NOTE

- If you are storing frequencies for an EDACS system, you must store them in order, with the first frequency in channel 1 for the current bank. For example, if you want to store frequencies of 150.0100, 150.0200, 150.0300, and 150.0400 MHz, you must store them in Channels 1, 2, 3, and 4 respectively.
- When **m** is on the display, you can also select your desired bank and channel number with the **FUNC** and arrow keys.

NOTE

- If you made a mistake in Step 3, **Invalid Freq** briefly appears and the scanner beeps when you press **ENTER**. Start again from Step 3.
- Your scanner automatically rounds the entered frequency to the nearest valid frequency. For example, if you enter a frequency of 151.553, your scanner accepts it as **151.550**.
- After a transmission, to have the scanner pause for 2 seconds on this channel before proceeding to the next active transmission, press **./DELAY** to turn the delay function on. See "Using the Delay Function" on Page 45. The scanner stores this setting in the

quency (including the decimal point) you want to store.

If you make a mistake, press **CL** to delete a single digit or press and hold **CL** about 2 seconds to delete all digits.

4. Press **ENTER** to store the frequency into the channel.
5. If necessary, press **MODE** to change the receiving mode.
6. If desired, program a text tag for the channel (see "Assigning a Text Tag to a Channel" on Page 29).
7. The next channel in sequence is ready for programming. Press **PGM** and then repeat steps 3 through 6.

Storing Trunking Frequencies into Channels

1. Press **PGM** and **FUNC** then ▲ or ▼ to select the desired bank to program.
2. Press **TRUNK** to enter into trunking mode.
3. Repeatedly press **MODE** to select **MOT** (Motorola) or **ED** (EDACS).
4. Press **PGM** and select the channel number using ▲ or ▼.
5. Enter the UHF trunking frequency and press **ENTER**.
6. Repeat Steps 4 and 5 to enter the other trunking group

frequencies for EDACS or additional control channel frequencies for Motorola systems.

7. If necessary, press **MODE** to change the receiving mode.

Storing Text Tags

You can customize your scanner by storing text tags (up to 12 characters) for easy identification of channel transmissions, trunk IDs, or banks.

Assigning a Text Tag to a Channel

1. Press **MANUAL**, enter the channel number where you want to enter the text, then press **MANUAL** again. m and the bank and channel number appear at the upper left corner of the display (for example: m100).

2. Press **PGM**. m changes to P.

3. Press **TEXT**. The cursor appears at the third line.

4. Enter the text using the numeral keys (see “Finding and Storing Active Frequencies” on Page 32).

   For example, to identify amateur (ham) radio transmissions in the 6 meter range, input “HAM 6m” as follows:

   - “H” is the second letter associated with 4 on the keypad. Press **4** then **2**.

NOTE
If you make a mistake, press ▲ or ▼ to move to the character you want to change.

- “A” is the first letter associated with 2 on the keypad. Press **2** then **1**.
- “M” is the first letter associated with 6 on the keypad. Press **6** then **1**.
- “Space.” Press **./DELAY**.
- “6” is the sixth number associated with 1 on the keypad. Press **1** then **6**.
- “m” is the first letter associated with 6 on the keypad. Press **6** and **FUNC** (for the lower case set), then press **1**.

5. Press **ENTER** to input the text.

Assigning a Text Tag to a 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 tag using the keypad. (See “Finding and Storing Active Frequencies” on Page 32).
7. Press **ENTER** to store.

Assigning a Text Tag to a Bank

1. Select a channel within the desired bank by pressing

MANUAL and entering the bank number (**000** for bank 0 or **200** for bank 2, for example). Press **MANUAL** again.

2. Press **PGM**.

3. Press **FUNC** then **7**. The cursor appears at the third line of the display. Enter the text using the keypad. (See “Text Input Chart”).

4. Press **ENTER** to store.

Text Input Chart

Press	Character
1	0123456789
2	ABC
2 then **FUNC**	abc
3	DEF
3 then **FUNC**	def
4	GHI
4 then **FUNC**	ghi
5	JKL
5 then **FUNC**	jkl
6	MNO
6 then **FUNC**	mno
7	PQRS
7 then **FUNC**	pqrs
8	TUV
8 then **FUNC**	tuv
9	WXYZ
9 then **FUNC**	wxyz
0	.-#_@+*+/ ,
0 then **FUNC**	$%!^()?->`<-

NOTE

- To access the numbers, after you press **TEXT** (when you assign the text tag to a channel) or you press **FUNC** and **7** (when you assign the text tag to a bank), press **1**. Then press the desired number you want to enter.
- To enter a lowercase character or a character from the second set for key 0, press **FUNC** after pressing the first numeral key.

NOTE

- You can use the scanner's delay feature while searching the search bank. See “Using the Delay Function” on Page 45.
- The scanner does not search locked-out frequencies while searching ranges. See “Locking Out Channels or Frequencies” on Page 45.

Press	Character
/DELAY	space
CL	backspace

Finding and Storing Active Frequencies

You can search for transmissions in the scanner’s preprogrammed search bank. The search bank is divided into six search bands. You can change the search range of Bank SR5 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 – SR5).

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

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

1. Repeatedly press **SEARCH** to select your desired search

bank (SR0, SR1, SR2, SR3, SR4, or SR5).

Current Search Bank

```
SR0 ...D..FM
M  156.80000
Channel 16
Marine Band
```

2. In the marine and CB bands, you can directly select a channel or search through the band. When M appears at the left most position of the second line, you can directly select a channel (refer to “Band Charts” on Page 34). Press the desired channel number while M appears to select it. You can also change the channels by pressing ▲ or ▼.

3. Press **FUNC** then **SEARCH** while M appears. M changes to S and now you can search through the band. Press **FUNC** then **SEARCH** again to return to the previous mode.

4. Rotate **SQUELCH** clockwise and leave it set to a point just after the hissing sound stops. After 2 seconds (if the delay feature is on), the received frequency appears and the scanner starts searching.

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

Band Charts

Search bank: SR0 Marine band

Receive mode: FM

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

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

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
37	27.3750	38	27.3850
39	27.3950	40	27.4050

Search bank:
SR2 Police/Fire band

Receive Mode: FM

Group	Frequency (MHz)	Step (kHz)
0	33.420–33.980	20
	37.020–37.420	20
	39.020–39.980	20
	42.020–42.940	20
	44.620–45.860	40
	45.880	
	45.900	
	45.940–46.060	40
	46.080–46.500	20
1	153.770–154.130	60
	154.145–154.445	15
	154.650–154.950	15
	155.010–155.370	60
	155.415–155.700	15
	155.730–156.210	60
	158.730–159.210	60
	166.250	
	170.150	
2	453.0375–453.9625	12.5
	458.0375–458.9625	12.5
	460.0125–460-6375	12.5
	465.0125–465.6375	12.5
3	856.2125–860.9875	25
	866.0125–868.9875	12.5

Search bank:
SR3 Aircraft

Receive mode: AM

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

Search bank:
SR4 Ham band

Receive mode: FM

Group	Frequency (MHz)	Step (kHz)
0	28.0000–29.7000	5
1	50.0000–54.0000	5
2	144.0000–148.0000	5
3	222.0000–225.0000	5
4	420.0000–450.0000	12.5
5	1240.0000–1300.0000	6.25

Search bank:
SR5 Programmable limit search

Receive mode:
FM (Default setting)

Searching Active Frequencies in Your Desired Frequency Range

You can program the desired frequency range for a search.

1. Repeatedly press **SEARCH** to select **SR5**.

2. Press **PGM** then **SEARCH**. **PSR** (Program Search) appears in the top line and the cursor

NOTE

- 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 41 to save the frequency. The frequency copy works only in search banks 2, 3, 4 and 5.
- While the scanner is searching, you can use the seek search by pressing **FUNC** then **7**. **Seek ON** appears on the bottom line. The scanner stops at an active frequency for five seconds and restarts searching automatically. The scanner repeats this operation.

blinks **L** on the second line for the lower-end limit frequency.

3. Use the number keys and **./DELAY** to enter the desired lower-end limit frequency (including the decimal point).
4. Press **ENTER** to set the frequency. The cursor moves to **H**. If the entered frequency is incorrect, **Invalid Freq** briefly appears.
5. Enter your desired higher-end frequency and press **ENTER**.
6. Rotate **SQUELCH** clockwise and leave it set to a point just after the hissing sound stops.
7. Press **SEARCH** to start searching. When the scanner finds an active frequency, it stops searching.

You can set Zeromatic on or off by pressing **FUNC** then **0**. Press **FUNC** then **0** again to reverse the Zeromatic setting. Whenever this feature is turned on, **Zeromatic ON** briefly appears then **z** appears at the first digit of the second line and the scanner stops at the correct frequency. When you turn this feature off, **z** disappears and the scanner stops when it detects an active signal. Zeromatic functions only in search banks 2, 3, 4 and 5.

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 turn off **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.

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 appears. 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**.
4. Press ▲ or ▼ to move up or down. When the scanner finds an active frequency, it stops on the frequency.

NOTE
If you press **PAUSE** while tuning, the scanner stops tuning and **** PAUSED **** appears. Press **PAUSE** again, and the scanner resumes tuning.

Listening to the Weather Band

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

NOAA and your local weather reporting authority broadcast your local forecast and regional

weather information on one or more of these channels.

Listening to a Weather Channel

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

Displaying Weather Messages

The weather service precedes each weather alert with a digitally-encoded SAME (Specific Area Message Encoding) signal, then a 1050 Hz tone. You can set the scanner to decode and display the SAME message when an alert is broadcast. Then if you are monitoring a weather channel with a digitally-encoded SAME signal when an alert is broadcast, the scanner will show the type of alert being broadcast such as **Warning**, **Watch**, **Statement**, or **Test Message**. The scanner will also sound alternating alert tones and display **Weather ALERT** when the scanner receives a 1050 Hz tone.

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

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

WX Alert and Beep Tone Confirmation

1. To test the WX alert, press **WX** for more than 2 seconds while **DIG WX STBY** appears.

   The display indicates the type of message, and the scanner sounds an alert or series of beeps. The beeps automatically change every 3 seconds.

2. Press any key except to stop test sound mode.

Using Frequency Copy

You can copy a frequency into a specified channel, a vacant channel in a specified bank, or a priority channel. However, you cannot copy a frequency from the Marine and CB 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.

1. Press **FUNC** 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. After about 1

NOTE

- The scanner does not display the actual area affected by SAME messages. It uses only the message portion of the SAME signal (**Warning**, **Watch**, **Statement**, or **Test Message**).
- Your scanner can also receive weather alert tones (see “Priority” on Page 47). The scanner sounds an alert or beep when it receives the SAME code. If you do not stop the alert, it sounds the alert (or beep) for five minutes. Then 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 .

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. The scanner automatically returns to search mode.

   If you try to copy a frequency which 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 **CL** to cancel.

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** then **ENTER** when you find a frequency you want to copy. **Bank9 Store?** appears.

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**. **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.

3. If you try to copy a frequency which 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 **CL** to cancel.

Copying a Frequency into the Priority Channel

You can copy a frequency into the priority channel (see “Priority” on Page 47) when the scanner stops on the frequency during Search, Scan, Manual, Tune, or WX mode.

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

Scanning the Channels

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

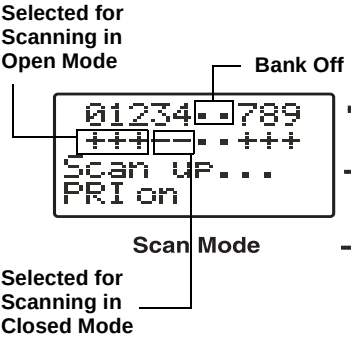
The scanner scans through all channels (except those you have locked out) in the active banks (see “Turning Channel-Storage Banks Off and On” on Page 44 and “Locking Out Channels or Frequencies” on Page 45).

NOTE

- 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 ▼.

Turning Channel-Storage Banks Off and On

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

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

Deleting Frequencies from Channels

1. Press **MANUAL**.
2. Use the number keys to enter the channel with the frequency you want to delete.
3. Press **MANUAL** again.
4. Press **PGM** to enter the program mode. **m** changes to **P**.
5. Press **FUNC**.
6. Press **CL**. The frequency number changes and **0.0000** appears.

SPECIAL FEATURES

USING THE DELAY FUNCTION

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

To turn delay on or off, press **. /DELAY**.

LOCKING OUT CHANNELS OR FREQUENCIES

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

Locking Out Channels

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

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

NOTE

Using the Delay Function

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

Locking Out Channels

You can still manually select locked-out channels.

Reviewing the Lock-Out Channels

To review all locked out channels, press **MANUAL**. Then repeatedly alternate between pressing **FUNC** and then **L/OUT** to view each locked-out channel. When you finish reviewing locked-out channels, press **MANUAL**.

Locking Out Frequencies

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

Reviewing Locked-Out Frequencies

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

1. Press **SEARCH** to set search mode.

2. Press **FUNC** then **L/OUT**. The locked-out frequency and **Lockout list** appear. Press ▲ or ▼ to review the list. The locked-out number and the total locked-out number also appear as **L/O XX of YY**. (The tenth of thirty locked out numbers would appear as **L/O 10 of 30**.) If the search bank has no locked-out frequencies, **Empty. Lockout list** appears. Press **FUNC** then **L/OUT** again to cancel reviewing locked-out frequencies.

NOTE

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

Locked-out

```
SL-2......FM
    42.44000
L/O 01 of 07
Lockout list
```

Clearing a Locked-Out Frequency

To clear a locked-out frequency, select that frequency (see “Reviewing Locked-Out Frequencies” on Page 46), then press **CL**.

If all locked-out frequencies are cleared within a bank, **Empty. Lockout list** appears.

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** then press **L/OUT**. **Lockout list** appears.
4. Press **FUNC** then **6**. **Confirm list clear? 1=YES. Press other key for NO.** appears. Press **1** to clear all locked-out frequencies. **List cleared** appears for about 2 seconds. Press any key other than **1** to cancel clear.

NOTE
If all frequencies in a bank you selected are locked out, you cannot clear all locked-out frequencies in that bank at the same time.

PRIORITY

In addition to the 1,000 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 a specific channel. When priority is turned on, the scanner checks that channel every 2 seconds, and stays on the channel if there is activity until the activity stops.

NOTE

- The priority feature does not operate while the scanner receives a trunking voice channel or during trunking delay time. Therefore, the priority check seems random during peak hours.
- If you program a weather channel as the priority channel, the scanner stays in the priority channel only when the scanner detects the weather alert tone
- This scanner cannot set a channel as the priority channel if the channel's receive mode is MOT or ED.

To program a frequency in the priority channel:

1. Press **MANUAL**.
2. Use the number keys to enter the channel number which contains the frequency you want to program as the priority channel. Then press **MANUAL** again.
3. Press **FUNC** then **PRI**. **Pri Channel** blinks on the bottom line.

To program 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**.

To program a weather channel as the priority channel:

1. Press **WX**.

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

3. Press **FUNC** then **PRI**. **Pri Channel** flashes on the bottom line two times.

To turn on the priority feature, press **PRI** so **P** appears on the top line while scanning. **PRIon** (or **PRIwx** if you set the priority to a weather frequency) appears on the bottom line. If the scanner detects activity on the priority channel, **Pri Channel** appears. Or if the scanner detects a weather alert tone in Priority WX mode, **Pri Channel** appears for 3 seconds then changes to **Weather ALERT** and the scanner sounds an alert tone (see "Displaying Weather Messages" on Page 40).

To turn off the priority feature, press **PRI**.

Changing the Receive Mode

The scanner is preset to the most common AM or FM receive mode for each frequency range. The preset mode is 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.

If you want to listen to trunking transmissions in closed mode, you

NOTE

- Priority WX is only for receiving a weather alert.
- When the scanner detects a 1050 Hz alert tone, priority WX activates and you receive a weather alert.
- If you program a weather frequency into the priority channel and the scanner detects a weather alert tone on that frequency, the scanner sounds the alert tone.

might have to change the receive mode.

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

AM — accesses the AM mode

FM — accesses the FM mode

MO — accesses the FM Mode, Motorola Trunking System (with a 4- or 5-digit ID code)

ED — accesses the FM Mode, EDACS Trunking System (with 4-digit decimal ID code or 5-digit AFS code)

Using the Attenuator

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

There are two attenuator modes in your scanner. One is normal attenuator mode in which you set the attenuator in each channel or each band/group in the search and tune mode. The other is global mode in which you set the attenuator only once. This setting is applied all the time in every mode.

Press **ATT** to turn on or off the attenuator while the channel number is indicated or while the scanner is searching through bands/groups. When the attenuator is on, **A** appears at the seventh digit in the top line.

NOTE
MO (MOT) and ED modes are not available when the scanner tunes up or down through the frequency ranges in which the trunking operation is not used.

When you turn it off, **A** changes to ".". You cannot set the attenuator while the scanner is scanning.

Press **FUNC** and then **ATT** to set the attenuator to its global mode. **Global ATT.** appears for 2 seconds at the bottom line and **a** or **-** appears. **a** means the attenuator is on and **-** means it is off. Press **ATT** to turn the attenuator on or off. **ATTon** or **ATT–** appears on the bottom line while scanning.

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. To turn the scanner's key tone off or on:

1. If the scanner is on, turn **VOLUME OFF/MAX** counterclockwise until it clicks to turn the scanner off.
2. Turn **VOLUME OFF/MAX** clockwise to turn the scanner on. **Welcome To Dual Trunking** appears.
3. While **Welcome To Dual Trunking** appears, press **1** to turn on the key tone or **2** to turn it off.

Using the Display Backlight

You can turn on the display's backlight for easy viewing in dimly

NOTE
If you turn on the attenuator, the scanner might not receive weak signals.

lit areas. Press 💡 to turn on the backlight for 5 seconds. To turn off the backlight before it automatically turns off, press 💡 again.

To turn on the backlight so it does not turn off automatically, hold down 💡 for about 1 second. Press 💡 while the backlight is on to turn it off.

You can select the amount of time the light stays on. Follow these steps to change the illuminated time:

1. If the scanner is on, turn it off and back on again. **Welcome to Dual Trunking** appears.
2. While **Welcome to Dual Trunking** appears, press 💡.
3. **Use Up/Down keys to set Lit off time 5 seconds** appears
4. Press ▲ or ▼ to select **3**, **5**, **10** or **20 seconds** then press **ENTER**.

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.

To turn on the key lock, press **FUNC** then 🔑/💡. **Key locked.** appears for about 1 second. **Key**

locked. appears when you press any key after locking the keypad.

To turn off the key lock, press **FUNC** then 🔑/ 💡. The scanner beeps three times and **Key unlocked** appears.

Changing the Display Contrast

1. Press **MANUAL**.
2. Press **FUNC** then **9**. **Use Up/ Down keys to set contrast.** appears.
3. Press ▲ or ▼ to select the contrast.
4. Press **ENTER** to set the display contrast.

Cloning the Programmed Data

You can transfer the programmed data to and from another PRO-95, PRO-93, or PRO-2053 scanner using an optional connecting cable with 1/8-inch phone plugs on both ends (not supplied, 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.
3. Press ▲. **Confirm send data? 1=YES Press other key for NO.** appears.

NOTE

"CLONE MODE" Incorrect Model appears if the scanner receives data from another scanner other than a PRO-95.

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

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

TRUNKING

Trunking Operation

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

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

To receive trunking signals, you must store all the trunking *control* frequencies for Motorola systems or all the trunking *group* frequencies for EDACS in one bank (see “Storing Known Frequencies into Channels” on Page 26) and input ID codes in the ID memory (see “Storing Talk Group IDs” on Page 62).

Your PRO-95 automatically calculates Motorola voice channel frequencies when it decodes the control channel. This eliminates

the need to enter all the Motorola group frequencies.

The control channels are subject to change depending on the day. Therefore enter all the control frequencies in the same bank. If you do not know which is the control channel, it is better to enter all the system frequencies into the same bank. (Refer to the supplied *Trunking Guide*.)

When the scanner decodes the Motorola control channel and finds the 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 ID number on the bottom line. **!**

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

Understanding Trunking

In the past, groups that transmit frequently, such as police departments, could transmit on only a few frequencies. This resulted in heavy traffic and often required 2-way radio users to wait for a specific frequency to clear before transmitting. Trunked systems allow more groups of 2-way radio users to use fewer frequencies. Instead of selecting a

! IMPORTANT !
To listen to the transmission, the mode of the programmed channel must be the same as that of the trunking channel (MOT, or ED).

NOTE

- There might be more than one talk group transmitting at a time in some Motorola trunking systems. If you set the scanner to manually tune in Motorola trunking mode, you will hear the talk group on that channel, but the display will alternate between all active IDs.
- Trunking group frequencies are included in the supplied *Trunking Guide*. Frequency fleet map and talk group information are also widely available on the Internet, (for example, at *www.trunkscanner.com*).

NOTE

- You can scan only one type of trunked frequency, either EDACS or Motorola in a bank at one time. You can, however, mix conventional channels and frequencies in a bank.
- If you are programming trunked frequencies for Motorola Type I and hybrid systems, you must first program the fleet map (see “Programming Fleet Maps” on Page 60).
- If you are programming frequencies for an EDACS system you must store them in the Logical Channel Number order (usually listed as LCN#). For example, LCN1 would go into channel 01 for the current bank, and LCN2 would go into channel 02.

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 conversation. For EDACS and Motorola (above 406 MHz range), the scanner monitors the control channel between each transmission to identify talk groups.

Setting Squelch for the Trunking Mode

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

Programming Trunking Frequencies

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

Follow these steps to program trunked frequencies:

1. Press **PGM** and press (or hold down) ▲ or ▼ to select the bank.

```
P000⚡.. D.+FM
      0.00000
Bank 0 Ch 00
```

2. Press **TRUNK** to enter the ID program mode.

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

```
Bank 0–0  ON
ID NO. 00
MOT: none
```

4. Press **PGM** to enter the program mode.

```
P000⚡.. D.+FM
      0.00000
Bank 0 Ch 00
```

5. Enter the desired trunking frequency then press **ENTER** to store.

```
P000⚡.. D.+FM
     866.3875
Bank 0 Ch 00
```

Frequency

NOTE

- To move through the bank selection faster, press **PGM** then **FUNC** and hold down ▲ or ▼. To move through the banks one at a time, repeat the sequence of **PGM**, **FUNC** then ▲ or ▼ until you reach the desired bank.
- If you select **Not trunked** instead of **MOT**, or **ED**, the scanner does not scan trunked frequencies. Instead, **Not trunked. Press mode** appears.

```
Bank 0

Not trunked
Press mode.
```

NOTE

Programming Trunking Frequencies

- If you enter a frequency that has already been entered, 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 **CL** 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.

Programming Motorola Trunking Systems (UHF-Lo)
Base and offset frequencies vary for each type of trunking system. You can get information about these frequencies for the trunking system you want to scan using *www.trunkscanner.com*, other Internet sources, or locally-published guidebooks.

6. To enter additional trunking frequencies as subsequent channels in the same bank, press **PGM** or ▲ to access the next open channel then enter the frequencies. (See “Storing Known Frequencies into Channels” on Page 26).

7. Press **SCAN** to start scanning.

If you make an error in the entry process, press **CL** as often as needed to erase the incorrect data.

Programming Motorola Trunking Systems (UHF-Lo)

You can program the scanner to receive transmissions in the UHF-Lo band (406-512 MHz) of the Motorola trunking system. You can receive these transmissions by checking the trunking system's control channel. You must program the system's base frequency and offset frequency to do this.

If you try to program an offset frequency in the UHF-Hi bands (806-960 MHz), the scanner ignores the entry.

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

1. Press **PGM** then **TRUNK** to enter the ID program mode.

2. Press **FUNC** and press (or hold) ▲ or ▼ to select the bank.

3. Press **MODE** and select **MOT**.

4. Press **FUNC** then **2**. The display indicates **Base freq.:** on the first line, **406.0000** on the second line, **Offset: 380** on the third line and **Step: 25.0kHz** on the bottom line.

5. While **B** in **Base** blinks, if necessary, press the desired Base frequency with the number keys and press **ENTER**. Confirm the entry. If it is incorrect, press the number keys again to set the base frequency. After you confirm the input, press **ENTER** again.

6. While **O** in **Offset** blinks, if necessary, enter the offset number and press **ENTER**. Confirm the entry. If it is incorrect, then press the number keys again to set the frequency. After you confirm the input, press **ENTER** again.

7. While **S** in **Step** blinks, repeatedly press ▲ or ▼ to select the step number, **25.0**, **50.0** or **12.5 kHz**, then press **ENTER**.

8. Press **PGM** to enter the program mode. Store the trunking IDs into the sub-bank in the same bank.

NOTE

- On the 800 MHz trunking band, you can select a base frequency (normal or offset).
- On the 900 MHz trunking band, you do not need to set the base frequency (base, offset, step).

Programming Motorola Trunking System (800 MHz)

Follow these steps to program 800 MHz band Motorola trunking.

1. Press **PGM** then **TRUNK** to enter the ID program mode.
2. Press **FUNC** then ▲ or ▼ to select the desired bank.
3. Press **MODE** and select Motorola trunking mode.
4. Press **FUNC** then **3. Use Up/ Down keys to set 800MHz base. Normal** appears.
5. Press ▲ or ▼ to select **Normal** or **Offset** and press **ENTER**.

- If you are uncertain about the base frequency, use the default setting. The default setting is **Normal**.
- If you cannot receive with the **Normal** setting, change to **Offset**. The base frequency in **Normal** is 851.0125 MHz. The base frequency in **Offset** is 851.0000 MHz.

Programming Fleet Maps

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

Follow these steps to program a fleet map.

1. Press **PGM** then **TRUNK**.

2. For each bank you want to program, repeatedly press **FUNC**. Then ▲ or ▼ to select the bank.

3. Press **FUNC**. Then press **8**. **Block 0 size code. Use 15 for type II. S-00** appears.

```
Block 0 size
code. Use 15
for type II.
S-00
```

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

Block	Size Code							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
0	S11	S4	S4	S12	S4	S3	S10	S1
1	S11	S4	S4	—	S4	S10	S10	S1
2	S11	S4	S4	S4	S12	S4	S11	S2
3	S11	S4	S4	S4	—	S4	S4	S2
4	S11	S4	S4	S4	S4	S12	S4	S3
5	S11	S4	S4	S4	S4	—	S4	S3
6	S11	S4	S12	S4	S4	S12	S4	S4
7	S11	S4	—	S4	S4	—	S4	S4
	9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
0	S4	S0	S4	S0	S3	S4	S4	S3
1	S4	S0	S0	S0	S3	S3	S4	S10
2	S0	S0	S0	S0	S11	S10	S4	S10
3	S0	S0	S0	S0	S4	S4	S11	S11
4	S0	S0	S0	S0	S4	S4	S11	S0
5	S0	S0	S0	S0	S0	S4	S0	S0
6	S0	S4	S0	S0	S0	S12	S12	S12
7	S0	S4	S0	S4	S0	—	—	—

NOTE

- The default setting of the bank is for Motorola Type II. However, if you set Type I and you want to return to Type II, enter 15 at Step 5.
- To confirm the input, repeat Steps 1–5 and press **ENTER**. Each time you press **ENTER**, you confirm the size code. If you find an error, press **CL** and begin again at Step 1.

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

6. Press **SCAN** to start scanning.

Talk Group IDs

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

Storing Talk Group IDs

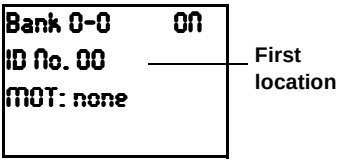
To store a talk group ID, press **TRUNK** when the scanner stops on a voice channel transmission or when a talk group ID is indicated in the manual mode. The bottom line indicates where the ID was stored as **ID save X–XX** and then changes to **ID#XXXX**.

The first **X** in **ID save X–XX** is the sub-bank number (**0–4**) in the bank. **XX** is the number of IDs from (**00–19**) in each sub-bank.

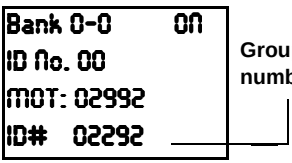
If the ID has already been stored when you press **TRUNK**, **ID was saved** appears.

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

1. Press **PGM**.
2. Press **TRUNK**.
3. To select the bank where you want to store the ID, repeatedly press **FUNC** then ▲ or ▼ until you reach the desired bank.



4. Press **MODE** to select **MOT** or **ED**.
5. Repeatedly press **TRUNK** to select the sub-bank.
6. Press ▲ or ▼ to select the location where you desire to store the ID number.
7. Enter the talk group ID and press **ENTER**. If necessary, use the decimal point for a hyphen.



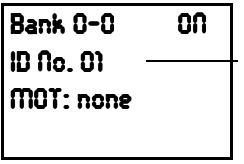
NOTE
When you try to store more than 100 talk group IDs in a bank, **Memory full!** appears. Clear some talk group IDs in order to store new ones (see “Clearing Talk Group IDs” on Page 67).

NOTE

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

8. If you want to tag the ID, press **TEXT**, enter the desired text tag for the ID. Then press **ENTER** (see “Finding and Storing Active Frequencies” on Page 32.)

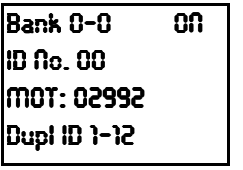
9. To store the next ID memory in sequence, press ▲ and repeat Step 4.



Next location

10. Press **SCAN** to start scanning.

If you entered an ID code that is already stored in another ID channel, **Dupl ID** appears. If you want to store the ID code, press **ENTER.** To cancel the operation, press **CL**.



Duplication

Talk Group 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), hold down **TRUNK** until **ID hold On.** appears.

When ID hold is activated and the scanner receives a voice channel,

the scan indication **S** at the first digit in the top line is changed to **H**.

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 turn the sub-bank on if it is off or off if it is on.

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

1. Press **FUNC** while the scanner is stopped on a voice channel transmission.
2. Press **TRUNK**. The display indicates which sub-bank is turned on or off, and the active sub-bank number flashes.
3. Press **FUNC** and the number of the sub-bank you desire to turn on or off. For example to turn sub-bank 4 on or off, press **FUNC**. Then **4**.

Locking Out Talk Group IDs

1. Press **PGM**.
2. Press **TRUNK**.

NOTE
You can only lock out talk group IDs when the scanner is in the closed mode (see "Open and Closed Modes" on Page 25).

3. Press **FUNC**, ▲ or ▼ to move to the desired bank.

4. Press ▲ or ▼ to select the ID memory.

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

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

You can confirm the ID code while the scanner shows the text when the received signal is a voice channel.

1. Press **TEXT** while the scanner is receiving the voice channel and indicating the text name. The ID code appears as **MOT:XXXXXXX** or **ED:XXXX**.

2. Press **TEXT** again to cancel.

Delay Function in ID Indication Mode

You can set the ID delay function separate from the channel delay.

1. Press **FUNC** then **./DELAY** while you are programming the trunked ID. **Use Up/Down keys to set ID delay. 2.0 seconds** appears.

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**.

NOTE
When activated, ID delay watches the control channel command for the delay time when the signal disappears from the voice channel.

Reviewing Locked-Out Talk Group IDs

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

1. Press **PGM** then **TRUNK**.
2. Press **FUNC**. Then **L/OUT**. The locked out ID appears. If the ID memory bank has no locked-out ID, you hear the low beep tone.
3. Press **FUNC** then ▲ or ▼ to select a search bank. Or, just press ▲ or ▼ to search for any locked out IDs in a bank.

Clearing Talk Group IDs

1. Press **PGM** then **TRUNK**.
2. Press **FUNC**, ▲ or ▼ to select ID memory.
3. Press **FUNC** then **CL**.

Clearing All Talk Group IDs in One Bank

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

1. Press **PGM**.
2. Press **TRUNK** to enter a talk group ID memory mode.
3. Select a talk group ID bank using **FUNC**, ▲ or ▼ .

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

5. Press **1** to clear all talk group IDs within a bank. **List cleared** appears.

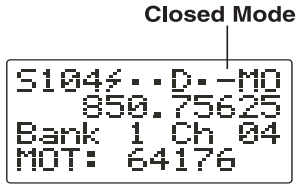
To cancel the deletion, press any key except **1**. The scanner returns to the talk group ID memory mode.

Changing the Open/Closed Mode

1. Press **MANUAL**.

2. Press **FUNC** then ▲ or ▼ to select the channel storage bank.

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



4. Repeat Steps 2 and 3 for each bank.

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

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

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

Birdie Frequencies

Every scanner has birdie frequencies. Birdies are signals created inside the scanner's

receiver. These operating frequencies might interfere with transmissions on the same frequencies. If you program one of these frequencies, you hear only noise on that frequency. If the interference is not severe, you might be able to turn **SQUELCH** clockwise to omit the birdie.

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

UHF Low Band (MHz)		
408.0000	420.7500	433.5000
446.2500	459.0000	471.7500
482.3065	484.5000	497.2500
	510.0000	

VHF High Band (MHz)		
114.7500	116.7375	119.8125
121.1250	123.9750	124.2000
125.9500	126.8250	126.9000
126.9750	127.0500	127.5000
129.0250	129.1500	132.1000
134.7625	135.6750	137.7000
140.2500	140.3850	146.0050
	168.9800	

VHF Low Band (MHz)		
25.5000	38.2500	41.8900
	51.000	

UHF High Band (MHz)		
867.2065	930.6437	1246.1750
1246.2500	1268.7750	1246.2500

To find the birdies in your scanner, begin by disconnecting the antenna and moving it away from the scanner. Make sure that no

other nearby radio or TV sets are turned on near the scanner. Use the search function and scan every frequency range from its lowest frequency to the highest. Occasionally, the searching will stop as if it had found a signal, often without any sound. This is a birdie. Make a list of all the birdies in your scanner for future reference.

GUIDE TO THE ACTION BANDS

TYPICAL BAND USAGE (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
New Mobile Narrow Band	220.000–222.000
1¼-Meter Amateur	222.000–225.000

UHF Band

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

Primary Usage

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

VHF Band	
Activities	**Frequencies (MHz)**
2-Meter Amateur Band	144.000 – 148.000
Government, Police, and Fire	153.785 – 155.980
Emergency Services	158.730 – 159.460
Railroad	160.000 – 161.900

UHF Band	
Activities	**Frequencies (MHz)**
70-Centimeter Amateur Band	420.000 – 450.000
FM Repeaters 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

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

Band Allocation

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

Abbreviation	Service
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)

10-Meter Amateur Band
(28.0-29.7 MHz)

29.000-29.700 ..... 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

NOTE
Some cities use the 470-512 MHz band for land/mobile service.

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	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 (MHz) x 1,000 = 30,620 kHz

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

127.800 (kHz) / 1,000 = 127.8 MHz

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

300/50 MHz = 6 meters

TROUBLESHOOTING

Problem	Possible Cause	Remedy
Scanner is totally inoperative.	The AC or DC adapter is not connected.	Be sure the adapter's barrel plug is fully inserted into the **PWR DC 9V** jack.
	Batteries have failed	Recharge the rechargeable batteries or replace the standard batteries
Poor or no reception.	An antenna is not connected or is connected incorrectly. Programmed frequencies are the same as “birdie” frequencies.	Be sure an antenna is properly connected to the scanner. Avoid programming frequencies listed under “Birdie Frequencies” on Page 69 or only listen to them manually.
The keypad does not work.	Keylock is turned on. The scanner might need to be reset or initialized.	Turn off keylock. Turn the scanner off then on again, or reset/ initialize the scanner (see “Resetting/ Initializing the Scanner” on Page 83).
The scanner is on but will not scan.	**SQUELCH** is not correctly adjusted. Only one channel or no channels are stored.	Turn **SQUELCH** clockwise. Store frequencies into more than one channel.
During scanning, the scanner locks on frequencies that have an unclear transmission.	Programmed frequencies are the same as “birdie” frequencies.	Avoid programming frequencies listed under“Birdie Frequencies” on Page 69, or only listen to them manually.

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.

Pressing the reset button does not clear the scanner's memory.

INITIALIZING THE SCANNER

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

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

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.

! 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 can save the information in your scanner's memory into your computer or another scanner before trying to initialize it. See "Transferring Data to and from Another Scanner or a PC" on Page 15.
- This procedure clears all information you stored in the scanner's memory. Initialize the scanner only when you are sure the scanner is not working properly.

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.

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

SPECIFICATIONS

Frequency Coverage (MHz)

25–54 ..... (in 5 kHz steps)

108–136.9875 ..... (in 12.5 kHz steps)

137–174 ..... (in 5, 6.25, or 7.5 kHz steps)

216.0025–221.9975 .. (in 5 kHz steps)

220.0000–225.0000 .. (in 5 kHz steps)

406–512 ..... (in 6.25 kHz steps)

806–823.9875 ..... (in 6.25 kHz steps)

849–868.9875 ..... (in 6.25 kHz steps)

894–960 ..... (in 6.25 kHz steps)

1240–1300 ..... (in 6.25 kHz steps)

Memory channels..... 1,000

Channel memory banks 10

Number of memory channels per bank 100

Talk group ID memories 1,000

ID memory banks..... 10

Sub-banks per bank..... 5

Number of memory IDs per sub-bank

..... 20

Sensitivity (20 dB S/N):

FM:

25–54 MHz ..... 0.3 µV

108 –136.9875 MHz ..... 0.3 µV

137–174 MHz ..... 0.5 µV

216–225 MHz ..... 0.5 µV

406–512 MHz ..... 0.5 µV

806–960 MHz ..... 0.7 µV

1240–1300 MHz ..... 0.7 µV

AM:

25–54 MHz ..... 1 µV

108–136.9875 MHz ..... 1 µV

137–174 MHz ..... 1.5 µV

216–225 MHz ..... 1.5 µV

406–512 MHz ..... 2 µV

806–960 MHz ..... 2 µV

1240–1300 MHz ..... 3 µV

Selectivity:

25 – 27.995 MHz at AM mode

-6 dB ..... +/-5 kHz

-50 dB ..... +/-6 kHz

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

-6 dB ..... +/-10 kHz

-50 dB ..... +/-18 kHz

Spurious Rejection (at 154.1 MHz FM) 40 dB

Scanning Rate ..... Up to 60 Channels per Second

Search Rate..... Up to 75 Steps per Second

Delay Time..... 2 seconds

Intermediate Frequencies (IF):

1st ..... 380.8 MHz

2nd..... 21.4 MHz

3rd..... 455 kHz

Priority Sampling..... 2 seconds

Operating Temperature... -14 to 140° F (-10 to 60° C)

IF Rejection

380.8 MHz at 154.1 MHz ..... 60 dB

21.4 MHz at 154.1 MHz ..... 100 dB

Squelch Sensitivity:

Threshold (FM and AM)..... 0.5µV

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 Ni-MH Batteries

External Power..... 9V DC

Current Drain (Squelched)..... 90 mA

Battery Charge Current..... 150 mA

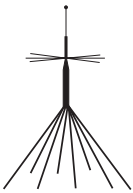
Dimensions (HWD) ..... 6 3/16 × 2 7/16 × 1 3/4 Inches (157 × 62 × 41 mm)

Weight (without antenna and batteries) 8.5 oz.(240 g)

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

PARTS AND ACCESSORIES

Parts and accessories are available at your local RadioShack store. Accessories are also available online at *www.radioshack.com*. Parts and accessories are available but not limited to the following. Visit your local RadioShack store or obtain a RadioShack catalog for a more complete listing of available accessories.



External Antenna

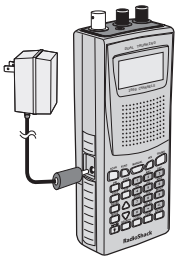
Connect to your scanner's external antenna jack for clear, crisp reception.

RG-8/RG-58 50-Ohm Coaxial Cable

Use to connect your scanner to an external antenna.

9V, 300 mA AC Adapter

Use to connect your scanner to AC power.



Connecting Cable

Use to connect your scanner to another scanner so you can transfer data between them.

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.

In the event of a product defect during the warranty period, take the product and the RadioShack sales receipt as proof of purchase date to any RadioShack store. RadioShack will, at its option, unless otherwise provided by law: (a) correct the defect by product repair without charge for parts and labor; (b) replace the product with one of the same or similar design; or (c) refund the purchase price. All replaced parts and products, and products on which a refund is made, become the property of RadioShack. New or reconditioned parts and products may be used in the performance of warranty service. Repaired or replaced parts and products are warranted for the remainder of the original warranty period. You will be charged for repair or replacement of the product made after the expiration of the warranty period.

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.

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

RadioShack Customer Relations, 200 Taylor Street, 6th Floor,
Fort Worth, TX 76102

12/99

RadioShack Corporation
Fort Worth, Texas 76102

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