PRO-97 Multi Trunk-Tracking
Handheld Scanner

20-527   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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Will add

FEATURES

Your RadioShack Handheld Scanner is one of a new generation of scanners designed to track Motorola® Type I and II (such as Smartnet® and Privacy Plus®) and hybrid analog trunking systems, GE-Ericsson (EDACS®) type systems, and EF Johnson (LTR) 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 65,000 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 three trunking systems (Motorola, EDACS and LTR) 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.

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

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

CTCSS and DCS Subaudible Encoded Squelch Modes – restricts conventional channel reception to transmissions using specified subaudible CTCSS tone or DCS data code when scanning or parked on a single chnanel. Code Search feature instantly displays the tone or code in use. Takes advantage of subaudible squelch tail elimination turn off codes when they are present.

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.

Signal Stalker – let you set the scanner so it detects then displays the frequency of a nearby strong radio transmission.

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

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.

Your scanner can receive these frequencies:
• 25 – 54 MHz
• 108 – 136.99166 MHz
• 137 – 174 MHz
• 216.0025 – 225 MHz
• 225.025 – 405.975 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 these 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 XX).
• vehicle power (with an optional DC adapter – see "Using Vehicle Battery Power" on Page XX).

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

"Resetting/Initializing the Scanner" on Page XX.

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

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.

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

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.

CAUTIONS:
• 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 of longer, remove the batteries. Batteries can leak chemicals that can destroy electronic parts.

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 XX.

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

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

Charging Rechargeable Batteries

Your scanner has a built-in charging circuit that lets you charge 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) 1600 mAh batteries.

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

To charge batteries with a DC adapter from a DC power source, you must use a 9V, 300 mA DC adapter such as RadioShack Cat. No. 273-1810 or 273-1815 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 1600 mAh NiMH rechargeable batteries. You can operate the scanner while recharging the rechargeable batteries, but charging takes longer.

Notes:
• The scanner can also charge Ni-Cd batteries. 600 mAh batteries require 6 hours and 850 mAh batteries require 8 hours to charge.
• When you charge Ni-Cd batteries, do not overcharge them. Overcharging shortens battery life.
• Rechargeable batteries last longer and deliver more power if you let them fully discharge once a month. To do this, use the scanner until Low battery! appears. Then fully charge the rechargeable batteries.

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.

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

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.

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.

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.

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.

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.

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, in the HEADPHONE 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 HEADPHONE 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-97 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 XX. 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 XX 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/Stalker — scans through the programmed channels, or signal stalker function activates.

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.

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

WX/Skywarn — scans through the seven preprogrammed weather channels, or moves skywarn channel (997 through 999 channel).

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, CT, DC, MO, ED, LT).

KEY symbol/LIGHT symbol — 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 v.

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

^ or v — 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 (Program) — 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 (Clear) — 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 four features before you begin programming the scanner.

Signal Stalker — allow you to listen to search strong signals quickly. See "Signal Stalker" on Page XX.

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 XX.

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

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

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, LTR trunking, Marine, CB, Police, Fire, Aircraft and Ham (see "Typical Band Usage (in MHz)" on Page XX).

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).

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.

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.

For the default setting, see "Searching a Preprogrammed Frequency Range" on Page XX.

UNDERSTANDING YOUR SCANNER'S MODES

You can program each channel with any of seven receive modes (AM, FM, CT, DC, MO, ED, and LT).

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

Notes:
. Trunked modes (MO, ED and LT) can only be selected for frequencies above 137 MHz.
. Your scanner's closed mode lets you hear only those trunking talkgroups you specify. For more information, see "Open and Closed Modes" on Page XX.

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 XX 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.

CTCSS Mode (CT)

CTCSS mode sets the scanner to receive transmissions using frequency modulation (FM) with Continuous Tone Coded Squelch System (CTCSS) subaudible tone codes. CTCSS allows multiple users to share a single radio frequency without hearing each other's transmissions. In your PRO-97 scanner, the CTCSS feature can be used to block the reception of transmissions on shared channel to only those that use the CTCSS mode also features a Code Search setting that allows you to instantly display and store unknown codes into the channel memory. CTCSS tones can sometimes be heard as a low "hum" in the background of a voice transmission. Many systems that use CTCSS transmit a special "turn off code" at the end of each transmission. The turn off code causes a properly equipped receiver to mute before the transmission ends, eliminating the "squelch tail" burst of noise the commonly occurs when the signal is lost. CTCSS turn off code performance can be affected by weak signals.

DCS Mode (DC)

DCS mode sets the scanner to receive transmissions using frequency modulation (FM) with Digital Coded Squelch (DCS) subaudible data signaling. DCS is very similar to CTCSS, except that a digital code is transmitted instead of an audio tone. Like CTCSS, DCS allows multiple users to share a single radio frequency without hearing each other's transmissions. In your PRO-97 scanner, the DCS feature can be used to block the reception of transmissions on a shared channel to only those that use the DCS tone that you have specified. DCS mode also features a Code Search setting that allows you to instantly display and store unknown codes into the channel memory. DCS data can sometimes be heard as a low "purring" sound in the background of a voice transmission. Some DCS systems transmit a special "turn off code" at the end of each transmission. The turn off code causes a properly equipped receiver to mute before the transmission ends, eliminating the "squelch tail" burst of noise the commonly occurs when the signal is lost.

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 II 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.

Notes:
. For example, a valid fleet-subfleet ID identifying all detectives within a police department might be 000-12, where 000 identifies all police users and 12 identifies the Detective division.
. Tuning the scanner to an active control channel while in Motorola mode will display the Motorola System. ID and the approximate control channel message decode success rate. This information can help you identify the Motorola trunking system that you are monitoring and the receive quality of the control channel signal.

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

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

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

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

EDACS Mode

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

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

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

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

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

LTR Mode

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

LTR systems are trunking systems used primarily by business or private communications service providers, such as taxicabs, delivery trucks, and repair services. There systems encode all trunking information as digital subaudible data that accompanies each transmission. Users on an LTR system are assigned to specific talk groups, which are identified by the radio as six-digit numbers. These numbers are in the form AHHUUU, where:

A = Area code (0 or 1)
H = Home repeater (01 through 20)
U = User ID (000 through 254)

When the scanner receives a transmission on a channel set to the LTR mode, it first decodes the LTR 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 LTR data matches a talk group ID that you have stored in the bank's talk group ID list and have not locked out.

LTR systems are frequently programmed so that each radio has a unique ID code.

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, EDACS, and LTR systems).

Notes:
• 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.
• When no ID code is programmed into the scanner, it receives the signal in MO, ED, or LT mode. In open mode, the scanner stops on any transmission. If the ID is stored, the text tag appears on the display. Otherwise, the talk group ID appears on the display. In closed mode, the scanner only stops on a transmission if the ID is stored.

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 MO, ED, or LT 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 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 XX for more information about setting the open and closed modes.

OPERATION

Turning on the Scanner and Setting Squelch

1. To turn on the scanner, turn VOLUME clockwise. Multi-system Trunking Scanner appears. After about 3 seconds, you might hear a hissing sound. Then adjust VOLUME to a comfortable level.

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

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

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

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 in to channels.

Notes:
• 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 frequency 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.

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).

Add illust

Notes:

• Press FUNC. Then press ^ or v. The bank number moves in the direction of the arrow pressed.

• Press FUNC. Then hold down ^ or v. The bank number moves continuously in the assigned direction.

• Press ^. The channel number moves upward one by one. Or, press v. The channel number moves downward one by one.

2. Press PGM. M changes to P.

3. Use the number keys and ./DELAY to enter the frequency (including the decimal point) you want to store.
If you make a mistake, press CL to delete a single digit or press and hold CL about 2 seconds to delete all signals.

4. Press ENTER to store the frequency into the channel.

Notes:

• 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 XX. The scanner stores this setting in 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 XX).

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 v to select the desired bank to program.

2. Press TRUNK to enter into trunking mode.

3. Repeatedly press MODE to select Motorola, EDACS, or LTR.

4. Press PGM and select the channel number using ^ or v.

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 16 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 XX).

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

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.
• "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 v to select the desired bank.

4. Press TRUNK to select the desired sub-bank.

5. Press or hold down ^ or v to select the desired group ID.

6. Press TEXT then enter the tag using the keypad. (See "Finding and Storing Active Frequencies" on Page XX).

7. Press ENTER to store.

Assigning a Text Tag to a Bank

1. Press FUNC then press bank number. Bank X (0 through 9) selected. Fn+CLR to delete all frequencies, TEXT to edit tag appears..

2. Press TEXT, then enter the text using the keypad.

3. Press ENTER to store.

Test Input Chart

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

PRESSED	CHARACTERS
1	0 1 2 3 4 5 6 7 8 9
2	A B C
2 then FUNC	a b c
3	D E F
3 then FUNC	d e f
4	G H I
4 then FUNC	g h I
5	J K L
5 then FUNC	j k l
6	M N O

6 then FUNC	m n o
7	P Q R S
7 then FUNC	p q r s
8	T U V
8 then FUNC	t u v
9	W X Y Z
9 then FUNC	w x y z
0	. - # _ @ + * & / '
0 then FUNC	$ % ! ^ ( ) ? ~ ' ^
•/DELAY	Space
CL	Back Space

Finding and Storing Active Frequencies

You can search for transmissions in the scanner's preprogrammed search bank. The search bank is divided into seven search bands. You can change the search range of Bank SR6 manually by setting the lower and higher ends of the search range.

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

Searching a Preprogrammed Frequency Range

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

Bank	Band
SR0	Marine
SR1	CB
SR2	FRS/GMRS/MURS
SR3	Police/Fire
SR4	Aircraft
SR5	Amateur Bands
SR6	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, SR5, or SR6).

Add illust

2. In the marine, CB, and FRS/GMRS/MURS bands, you can directly select a channel or search through the band. When MAN appears at the right position of the third line, you can directly select a channel (refer to "Band Charts" on Page XX). Press the desired channel number while MAN appears to select it. You can also change the channels by pressing ^ or v.

3. Press FUNC then SEARCH while MAN appears. MAN changes to SRCH 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	156.0500	05	156.2500
06	156.3000	07	156.3500
08	156.4000	09	156.4500
10	156.5000	11	156.5500
12	156.6000	13	156.6500
14	156.7000	15	156.7500
16	156.8000	17	156.8500
18	156.9000	19	156.9500
20	157.0000 161.6000	21	157.0500
22	157.1000	23	157.1500
24	157.2000 161.8000	25	157.2500 161.8500
26	157.3000 161.9000	27	157.3500 161.9500
28	157.4000 162.0000	63	156.1750
64	156.2250 160.8250	65	156.2750
66	156.3250	67	156.3750

68	156.4250	69	156.4750
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	85	157.2750
	161.8250		161.8750
86	157.3250	87	157.3750
	161.9250		161.9750
88	157.4250		

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

Search 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 FRS/GMRS/MURS band

Receive Mode: FM

Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	462.56250	02	462.58750
03	462.61250	04	462.63750
05	462.66250	06	462.68750
07	462.71250	08	467.56250
09	467.58750	10	467.61250
11	467.63750	12	467.66250
13	467.68750	14	467.71250
15	462.55000	16	462.57500
17	462.60000	18	462.62500
19	462.65000	20	462.67500
21	462.70000	22	462.72500
23	151.82000	24	151.88000
25	151.34000	26	154.57000
27	154.60000		

Search bank: SR3 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: SR4 Aircraft

Receive mode: AM

Frequency (MHz)	Step (kHz)
108.000-136.99166	8.33

Search bank: SR5 Amateur 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: SR6 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 SR6.

2. Press PGM then SEARCH. Enter SR6 Search Range Limits: appears in the top line and the cursor blinks L on the third 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.

Notes:
• 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 XX to save the frequency. The frequency copy works only in search banks 3, 4, 5, and 6.
• While the scanner is searching, you can use the seek search by pressing FUNC then 7. Seek Search 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.

You can set Zeromatic on or off by pressing FUNC then 0. Press FUNC the 0 again to reverse the Zeromatic setting. Whenever this feature is turned on, Zeromatic ON. briefly appears then ZM appears at the right of the second line and the scanner stops at the correct frequency. When you turn this feature off, ZM changes small caps (zm) and the scanner stops when it detects an active signal. Zeromatic functions only in search banks 3, 4, 5 and 6.

There are several group banks in SR3 Police/Fire and SR5 Amateur 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 v to start searching down from the highest frequency.

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

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. Fine Tune Mode 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 v to move up or down. When the scanner finds an active frequency, it stops on the frequency.

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.

SAME Standby Mode

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

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

1. Press WX until you identify the weather station with the strongest signal for your location.

2. Press FUNC, and the PROG to access the FIPS code entry table.

3. Use the ^ or v keys to select the desired FIPS code storage location.

4. Use the numeric keys to enter the desired FIPS code, and then press ENTER to store the code. Press TEXT to label the code entry with an alphanumeric text table if desired. Repeat this process for all the FIPS codes that you wish to store.

5. Press L/OUT to lock out or enable specific FIPS entries.

6. Press WX to exit the FIPS code entry table.

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

7. Press FUNC, and then WX to initiate SAME standby. The scanner will monitor the selected weather radio station for alerts with FIPS codes that match the codes you entered in the FIPS entry table. To exit SAME standby, press FUNC, and then WX.

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 LIGHT to stop test sound mode.

Skywarn

This function lets you move to the skywarn channel (channels 997 through 999) from any mode except SAME standby by press and hold WX about 1 second then the scanner displays SKYWARN-1 in fourth line. The scanner have 3 skywarn channels. Pressing ^ or v to move skywarn channels upward or downward.

Note: To activate the this function, you may program the skywarm frequency into skywarn channels.

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, CB, and FRS/GMRS/MURS 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.
Store in ChXXX ? 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 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. Channel Stored! 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.Freq. 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. Bank 9 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. Channel Stored! 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.Freq. ChXXX appears at the third lime. If you want to copy the duplicate frequency anyway, press ENTER, or if not, press CL to cancel.

Coping a Frequency into the Priority Channel

You can copy a frequency into the priority channel (see "Priority" on Page XX) 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.

SIGNAL STALKER

Your scanner's Signal Stalker feature lets you detect strong signals in a wide bandwidth of approx. 1 MHz to search transmission quickly.

Using the Signal Stalker

Your scanner's Signal Stalker functions when you press and hold SCAN more than 1 second. The Signal Stalker function has two kinds of bands, All Band and Police/Fire Band. You can turn on/off sub-band using numeral key.

Note: While the Signal Stalker functions, priority feature does not work.

Lock Out While Signal Stalker Functions

The scanner's lock out feature works while Signal Stalker functions. When the scanner has more than 2 lockout frequencies in a band stage, it does not detect and skips the band stage.

To lock out a signal, press L/OUT when the scanner stops on the frequency. To remove the lockout, review the lockout frequency and press L/OUT.

To review the lockout frequency, press FUNC then L/OUT during Signal Stalker. The scanner indicates "Review L/O" on the first line, and the locked-out frequency, group number, and band stage number on the third line. It is indicated whether it is the lockout of what number in the last line. You can move to the next lockout frequency using up or down key.

Scanning the Channels

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

Notes:
• 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 v.

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 XX and "Locking Out Channels or Frequencies" on Page XX).

Turning Channel-Storage Banks Off and On

To turn off banks while scanning, press the bank's number key 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.

Add illust

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.

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

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.

Deleting All Frequencies into a Channel Bank

1. Press PGM.

2. Press FUNC then ^ or v to select the bank you cleared.

3. Press FUNC then 1. Bank X selected. Fn+CLR to delete all frequencies. TEXT to edit tag appears.

4. Press FUNC then CL. Clear entire bank? Press 1 to clear all, any other key aborts appears.

5. Press 1 to clear the selected bank's all channel memory. please stand by. appears. Press any other than 1 to cancel clear.

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, DLY appears and the scanner continues to monitor the channel for 2 seconds after the transmission stops before it resumes scanning or searching.

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

To turn delay on or off, press ./DELAY. DLY (delay on) or dly (delay off) appears on the display

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 lo change LO on the display.

Note: You can still manually select locked-out channels.

To remove the lockout from a channel, manually select the channel and press L/OUT so LO changes to lo.

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.

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

Locked out! appears and the scanner does not search.

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 v to review the list. The locked-out number and the total locked-out number also appears as L/O XX of YY. (The tenth of thirty locked out number 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.

Add illust

Clearing a Locked-Out Frequency

To clear a locked-out frequency, select that frequency (see "Reviewing Locked-Out Frequencies" on Page XX), 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. Clear entire list ? Press 1 to clear all, any other key aborts 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.

Notes:
• 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, ED, or LTR.

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. Priority Channel blinks.

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. Priority Channel flashes two times.

To turn on the priority feature, press PRI so pri changes PRI on the display while scanning. If the scanner detects activity on the priority channel, Priority Channel appears. Or if the scanner detects a weather alert tone in Priority WX mode, Priority Channel! appears for 3 seconds then changes to Weather ALERT and the scanner sounds an alert tone (see "Displaying Weather Messages" on Page XX).

Notes:
• Priority WX is only for receiving a weather alert.
• When the scanner detects a 1050 Hz alert tone, priority WX activates and you receive a weather alert.
• 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.

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 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
CT – accesses the FM mode, CTCSS System
DC – accesses the FM mode, DCT System
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)
LT – accesses the FM mode, LTR Trunking System (with 6-digit ID code)

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

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, att changes to ATT.

When you turn it off, ATT changes to att. 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 atg appears. Press ATT to turn the attenuator on or off. ATG or atg appears on the second line.

Press FUNC and then ATT again to turn off the global attenuation mode. Normal ATT. appears on the bottom line for about 2 seconds.

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

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. Multi-system Trunking Scanner appears.

3. While Multi-system Trunking Scanner 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 lit areas. Press LIGHT to turn on the backlight for 5 seconds. To turn off the backlight before it automatically turns off, press LIGHT again.

To turn on the backlight so it does not turn off automatically, hold down LIGHT for about 1 second. Press LIGHT 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. Multi-system Trunking Scanner appears.

2. While Multi-system Trunking Scanner appears, press LIGHT.

3. Use Up/Down keys to set Lit off time 5 seconds appears

4. Press ^ or v 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, KEY/LIGHT, 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/LIGHT. 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 the KEY/LIGHT. 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 v 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-97 scanner using an optional connecting cable with 1/8-inch (3.5 mm) phone plugs on both ends (not supplied, available at your local RadioShack store).

Note: "CLONE MODE" Incorrect Model appears if the scanner receives data from another scanner other than a PRO-97.

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.

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) and EF Johnson (LTR) 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 and LTR in one bank (see "Storing Known Frequencies into Channels" on Page XX) and input ID codes in the ID memory (see "Storing Talk Group IDs" on Page XX).

Your PRO-97 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.

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.

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

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.

Notes:
• 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.
• Frequency fleet map and talk group information are also widely available on the Internet, (for example, at www.trunkscanner.com).

Understanding Trunking

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

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. For some Motorola (under 512 MHz range) and LTR systems, the scanner uses the subaudible data sent with 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 (MO, ED, or LT) with each frequency.

Notes:
• You can scan only one type of trunked frequency, either EDACS, Motorola, or LTR 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 XX).
• 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.
• If you are programming frequencies for an LTR system you must store them in the home repeater order. For example, home repeater order 1 would go into channel 01 for the current bank, and home repeater order 2 would go into channel 02.

Follow these steps to program trunked frequencies:

1. Press PGM and press (or hold down) ^ or v to select the bank.

Notes: To move through the bank selection faster, press PGM then FUNC and hold down ^ or v. To move through the banks one at a time, repeat the sequence of PGM, FUNC then ^ or v until you reach the desired bank.

2. Press TRUNK to enter the ID program mode.

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

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Note: If you select conventional mode instead of MO, ED, or LT, the scanner does not scan trunked frequencies. Trunking mode not selected, press Mode key. appears.

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4. Press PGM to enter the program mode.

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

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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 XX).

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7. Press SCAN to start scanning.

Notes:
• If you enter a frequency that has already been entered, the scanner sounds an error tone and displays Dupl.Freq. 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.

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.

Note: Base and offset frequencies vary for each type of trunking system. You can get information about these frequencies for the trunking system you want to scan using www.trunkscanner.com, other Internet sources, or locally published guidebooks.

If you try to 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 v to select the bank.

3. Press MODE and select MOT.

4. Press FUNC then 2. The display indicates Custom Range 1/3 on first line, Base Freq.: on the second 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 v to select the step number, 5.0, 6.25, 10.0, 12.5, 15.0, 18.75, 20.0, 25.0, 30.0, 31.25, 35.0, 37.5, 40.0, 43.75, or 50.0 kHz, then press ENTER.

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

Programming Motorola Trunking System (800 MHz)

Follow these steps to program 800 MHz band Motorola trunking

Notes:
• 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).

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

2. Press FUNC then ^ or v 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 Motorola ch plan NORMAL appears.

5. Press ^ or v to select NORMAL or SPLINTER 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 v to select the bank.

3. Press FUNC. Then press 8. Size Code Setting appears.

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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	—	—	—

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

Notes:
• 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 4.
• 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.

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 30 ID locations. You can program up to 150 talk group IDs in each bank, so you can program up to 1,500 talk group IDs in 10 banks. When the scanner stops on a transmission in the Motorola, EDACS, or LTR 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 (00-29) in each sub-bank.

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

Note: When you try to store more than 150 talk group IDs in a bank, Memory Full! appears. Clear some talk group IDs in order to store new ones (see "Clearing Talk Group IDs" on Page XX).

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

1. Press PGM.

2. Press TRUNK.

3. To select the bank where you want to store the ID, repeatedly press FUNC then ^ or v until you reach the desired bank.

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4. Press MODE to select MO, ED, or LT.

5. Repeatedly press TRUNK to select the sub-bank

6. Press ^ or v 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.

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8. If you want to tag the ID, press TEXT, enter the desired text tag for the ID. Then press ENTER (see "Text Input Chart" on Page XX).

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

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10. Press SCAN to start scanning.

Notes:
• If you made a mistake in Step 4, Invalid ID value 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 format.

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

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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 change 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 press 4.

Locking Out Talk Group IDs

1. Press PGM.

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

2. Press TRUNK.

3. Press FUNC, ^ or v to move to the desired bank.

4. Press ^ or v to select the ID memory.

5. Press L/OUT to lock out the ID. lo changes to LO.

6. To remove the lockout from a trunking ID, manually select the ID memory, and press L/OUT. LO changes to lo.

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:XXXXXX, etc.

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. ENTER key saves. 2.0 seconds appears.

2. Press ^ or v 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.

Clearing Talk Group IDs

1. Press PGM then TRUNK.

2. Press FUNC, ^ or v 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 v.

4. Press FUNC then 6. Clear entire list ? Press 1 to clear all, any other key aborts 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 v to select the channel storage bank.

3. Press FUNC then ./DELAY. Bank OPEN. or Bank CLOSED. appears. After that message disappears, the fifteenth digit on the second line of the display changes from + to – or vice versa.

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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:

Add birdie frequencies

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
1 1 /4 –Meter Amateur	222.000–225.000

UHF Band

U.S. Government	406.000–420.000
70-cm Amateur	420.000–450.000
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
Government, Police and Fire	153.785–155.980 MHz
Emergency Services	158.730–159.460 MHz
Railroad	160.000–161.900 MHz
Land-Mobile "Paired" Frequencies	220.000–222.000 MHz

UHF Band

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

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

BAND ALLOCATION

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

Abbreviations Services

AIR	Aircraft
BIFC	Boise (ID) Interagency Fire Cache
BUS	Business
CAP	Civil Air Patrol
CCA	Common Carrier
CB	Citizens Band
CSB	Conventional Systems
CTSB	Conventional/Trunked Systems
FIRE	Fire Department
HAM	Amateur (Ham) Radio
GOVT	Federal Government
GMR	General Mobile Radio
GTR	General Trunked
IND	Industrial Services (Manufacturing, Construction, Farming and Forest Products)

MAR   Military Amateur Radio

MARI   Maritime Limited Coast (Coast Guard, Marine Telephone, Shipboard Radio, and Private Stations)

MARS   Military Affiliate Radio System

MED   Emergency/Medical Services

MIL   U.S. Military

MOV   Motion Picture/Video Industry

NEW   New Mobile Narrow

NEWS   Relay Press (Newspaper Reporters)

OIL   Oil/Petroleum Industry

POL   Police Department

PUB   Public Services (Public Safety, Local Government, and Forestry Conservation)

PSB   Public Safety

PTR   Private Trunked

ROAD   Road & Highway Maintenance

RTV   Radio/TV Remote Broadcast Pickup

TAXI   Taxi Services

TELM   Telephone Maintenance

TOW   Tow Trucks

TRAN   Transportation Services (Trucks, Tow Trucks, Buses, Railroad, and Other)

TSB   Trunked Systems

TVN   FM-TV Audio Broadcast

USXX   Government Classified

UTIL   Power & Water Utilities

WTHR Weather

HIGH FREQUENCY (HF)

High Band-(25.00–27.63 MHz in 5 or 10 kHz steps)

Frequency Range	Service
25.020–25.320	IND
25.870–26.470	RTV
26.62	CAP
26.965–27.405	CB
27.430–27.630	BUS

10-Meter Amateur Band (in 5 kHz steps)

Frequency Range	Service
28.000–29.700 MHz	HAM

VERY HIGH FREQUENCY (VHF)

VHF Low Band-(29–50 MHz in 5 kHz steps)

Frequency Range	Service
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, IND, TELM, PUB
36.000–36.230	GOVT, MIL
36.250	Oil Spill Cleanup
36.270–36.990	GOVT, MIL
37.020–37.980	PUB, IND
38.000–39.000	GOVT, MIL
39.020–39.980	PUB
40.000–42.000	GOVT, MIL, MARI
42.020–42.940	POL
42.960–43.180	IND
43.220–43.680	IND, PUB
43.700–44.600	TRAN
44.620–46.580	POL, PUB
46.600–46.990	GOVT
47.020–47.400	PUB
47.420	American Red Cross
47.440–49.580	IND, PUB
49.610–49.990	MIL

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

Frequency Range	Service
50.000–54.000	HAM

Aircraft Band-(108–137 MHz in 12.5 kHz steps)

Frequency Range	Service
108.000–121.490	AIR
121.500	AIR Emergency
121.510–136.975	AIR

U.S. Government Band (137–144 MHz in 5 kHz steps)

Frequency Range	Service
137.000–144.000	GOVT, MIL

2-Meter Amateur Band (144–148 MHz in 5 kHz steps)

Frequency Range	Service
144.000–148.000	HAM

VHF High Band (148–174 MHz in 5, 6.25 or 7.5 kHz steps)

Frequency Range	Service
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
152.0075	MED
152.030–152.240	TELB
152.270–152.480	IND, TAXI, BUS
152.510–152.840	TELB
152.870–153.020	IND, MOV
153.035–153.725	IND, OIL, UTIL
153.740–154.445	PUB, FIRE
154.490–154.570	IND, BUS
154.585	Oil Spill Cleanup
154.600–154.625	BUS
154.655–156.240	MED, ROAD, POL, PUB
156.255–157.425	OIL, MARI
157.450	MED
157.470–157.515	TOW
157.530–157.725	IND, TAXI
157.740	BUS
157.770–158.100	TELB
158.130–158.460	BUS, IND, UTIL
158.490–158.700	TELB
158.730–159.465	POL, PUB, ROAD
159.480	OIL
159.495–161.565	TRAN
161.580–162.000	OIL, MARI, RTV
162.0125–162.350	GOVT, MIL, USXX
162.400–162.550	WTHR
162.5625–162.6375	GOVT, MIL, USXX

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

New Mobile Narrow Band (220–222 MHz in 5 kHz steps)

Frequency Range	Service
220.000–222.000	NEW

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

Frequency Range	Service
222.000–225.000	HAM

ULTRA HIGH FREQUENCY (UHF)

U. S. Government Band (406–420 MHz in 6.25 kHz steps)

Frequency Range	Service
406.125–419.975	GOVT, USXX

70-cm Amateur Band (420–450 MHz in 6.25 kHz steps)

Frequency Range	Service
420.000–450.000	HAM

Low Band (450–470 MHz- in 6.25 kHz steps)

Frequency Range	Service
450.050–450.925	RTV
451.025–452.025	IND, OIL, UTIL
452.0375–453.000	IND, TAXI, TRAN, TOW, NEWS
453.0125–454.000	PUB, OIL
454.025–454.975	TELB
455.050–455.925	RTV
457.525–457.600	BUS
458.025–458.175	MED
460.0125–460.6375	FIRE, POL, PUB
460.650–462.175	BUS
462.1875–462.450	BUS, IND
462.4625–462.525	IND, OIL, TELM, UTIL
462.550–462.925	GMR, BUS
462.9375–463.1875	MED
463.200–467.925	BUS

FM-TV Audio Broadcast, UHF Wide Band (470–512 MHz in 6.25 kHz steps) (Channels 14 through 69 in 6 MHz steps)

Frequency	Channel
475.750	14
481.750	15
487.750	16
493.750	17
499.750	18
505.750	19
511.750	20

Note: Some cities use the 470–512 MHz band for land/mobile service.

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

Frequency Range	Service
851.0125–855.9875 MHz	CTSB

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

Frequency Range	Service
856.0125–860.9875 MHz	TSB

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 1000 = 30,620 kHz

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

127,800 (kHz) / 1000 = 127.8 MHz

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

300/50 MHz = 6 meters

TROUBLESHOOTING

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

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.	Be sure an antenna is properly connected to the scanner.
	Programmed frequencies are the same as "birdie" frequencies.	Avoid programming frequencies listed under "Birdie Frequencies" on Page XX or only listen to them manually.
The keypad does not work.	Keylock is turned on.	Turn off keylock.
	The scanner might need to be initialize.	Turn the scanner off then on again, or initialize the scanner (see "Initializing the Scanner" on Page XX).
The scanner is on but will not scan.	SQUELCH is not correctly adjusted.	Turn SQUELCH clockwise.
	Only one channel or no channels are stored.	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 XX, or only listen to them manually. |

INITIALIZING THE SCANNER

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

Note: 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 XX.

1. Turn off the scanner, then turn it on again. Multi-system Trunking Scanner appears.

2. Press 0 then 1 while Multi-system Trunking Scanner appears. Initializing please stand by. appears for about 5 seconds.

Note: 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 third line.

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 an 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:
25–54 MHz .... (in 5 kHz steps)
108–136.99166 MHz .... (in 8.33 kHz steps)
137–174 MHz .... (in 5, 6.25, 7.5, or 12.5 kHz steps)

216.0025–225.0000 MHz .... (in 5 kHz steps)

225.025–405.975 MHz .... (in 25 kHz steps)

406–512 MHz...(in 6.25 kHz steps)

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

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

894– 960 MHz...(in 6.25 kHz steps)

1240–1300 MHz .... (in 6.25 kHz steps)

Memory channels 1000

Channel memory banks 10

Number of memory channels per bank 100

Talk group ID memories 1,500

ID memory banks 10

Sub-banks per bank 5

Number of memory IDs per sub-bank 30

Sensitivity (20 dB S/N):

FM:

25–54 MHz..... .... 0.3 uV

108 –136.99166 MHz .... 0.3 uV

137–174 MHz ... . 0.5 uV

216–225 MHz ....1 uV

406–512 MHz .... 0.5 uV

806–960 MHz... .... 0.7 uV

1240–1300 MHz .. ..0.7 uV

AM:

25–54 MHz ....1 uV

108–136.99166 MHz ....1 uV

137–174 MHz ... .1.5 uV

216–225 MHz ....3 uV

406–512 MHz .... 2 uV

806–960 MHz .... 2 uV

1240–1300 MHz .. .. 3 uV

Selectivity:

25 – 27.995 MHz at AM mode

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

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

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

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

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

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) .... 0.5 uV

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) .... 5 3 /4 x 2 9 /16 x 1 5 /8 Inches

(145 x 65 x 42 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.

Address and Warranty

Date Code & Vender Code (GE-04D-2310)