

OWNER'S MANUAL

Cat. No. 20-196

PRO-2067

Mobile Trunking Scanner

Please read **before** using this equipment.

## FEATURES

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Your RadioShack PRO-2067 500-Channel Mobile Trunking Scanner is one of a new generation of scanners designed to track Motorola(R) Type I and Type II (such as Smartnet and Privacy Plus) and hybrid analog trunking systems, plus GE/Ericsson (EDACS(R)) and EF Johnson (LTR(R)) 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 large range 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 (both as a sub audible code on that frequency and on a different frequency called a data channel) 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 PRO-2067 monitors the data sent with a 2-way radio transmission, so you can hear the call and response for that user and more easily "follow" the conversation.

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

The scanner gives you direct access to over 33,000 frequencies including those used by police and fire departments, ambulance services, government agencies, air and amateur radio services.

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Your scanner includes these special features:

Hyperscan™ and Hypersearch™ – let you set the scanner to scan at up to 25 channels per second and search at up to 50 steps per second, to help you quickly find interesting transmissions.

Simultaneous Trunking Operation – tracks three trunking systems: LTR, Motorola and EDACS at the same time, as well as conventional systems.

Text Input – lets you input the text on each channel, Trunk ID, Bank, or other memory so you can easily know about the transmission you are hearing.

Private Line Receiving – decodes and displays the Continuous Tone Coded Squelch System (CTCSS) tone signal being transmitted.

Digital Private Line Receiving – decodes and displays the Digital Coded Squelch (DCS) being transmitted.

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

10 Channel-Storage Banks – let you store 50 channels in each bank to group channels so calls are easier to identify.

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

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

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

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

ATT (Attenuate) Button – lets you program each memory to reduce the scanner's sensitivity to strong local signals, to reduce interference or noise caused by these signals.

Weather Alert – automatically sounds the alarm tone to advise of hazardous weather conditions when it detects the alert signal on the local NOAA weather channel.

Weather SAME – automatically sounds the alarm tone to alert you to hazardous weather conditions and displays the event text so you can see what the alert is for.

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.

DIN-E Size – you can install the scanner in the mounting space provided in many new vehicles.

Supplied Frequency Guide – lists the frequencies for many of the public safety systems you can listen to.

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

Data Cloning – lets you transfer the programmed data to another PRO-2067 scanner. You can also upload or download the programmed data to or from a PC using an optional interface kit.

We recommend you record your scanner's serial number here. This number is on the scanner's back panel.

Serial Number: \_\_\_\_\_

Your PRO-2067 scanner can receive these frequencies:

- . 29-54 MHz
- . 108-136.9875 MHz
- . 137-174 MHz
- . 380-512 MHz
- . 806-823.9875 MHz
- . 849-868.9875 MHz
- . 894-960 MHz

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

#### FCC NOTICE

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

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

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

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

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

## SCANNING LEGAALLY

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

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

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

CONTENTS

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## PREPARATION

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### INSTALLING AN ANTENNA

You must install an antenna before you can operate your scanner. Your local RadioShack store sells a variety of scanner antennas for both mobile and base-station use. Choose the one that best meets your needs.

#### Selecting an Antenna

When deciding on a mobile or base-station antenna and its location, consider these points:

- . The antenna should be as high as possible on a vehicle or the house.
- . The antenna and its cable should be as far as possible from sources of electrical noise (ignition systems, gauges, and so on).
- . The antenna should be vertical for the best performance.

#### Mounting an Antenna

Once you choose an antenna, follow the mounting instructions supplied with the antenna. Then route the antenna cable to the scanner.

Note: To connect the antenna, always use 50-ohm coaxial cable, such as RG-58 or RG-8. For lengths over 50 feet, use RG-8 low-loss dielectric coaxial cable. Your local RadioShack store carries a wide variety of coaxial antenna cable.

#### Cautions:

- . Do not run the cable over sharp edges or moving parts that might damage it.
- . Do not run the cable next to power cables or other antenna cables.
- . Do not run the cable through a vehicle's engine compartment or other areas that produce extreme heat.



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

## MOUNTING THE SCANNER IN YOUR VEHICLE

Before you install your scanner, read all the instructions in this owner's manual. You should be able to answer all of these questions about your vehicle's electrical and sound systems:

- . Which terminal in my vehicle's fuse box is for accessories?
- . How do I connect a wire to the fuse box?

Also, be aware that installation in your vehicle might require cutting or modifying your vehicle.

The most common mounting locations for this scanner are in the space provided in or under your vehicle's dashboard. If you use this scanner in a vehicle, you must mount it securely to avoid damage to the scanner or vehicle or injury to anyone in the vehicle during sudden starts or stops.

When you choose a mounting location, be sure:

- . you can easily reach the scanner
- . all wires and cables will reach their connection points
- . wires and cables will not interfere with the vehicle's pedals or other moving parts
- . the scanner is not directly in front of any heating vents

### Preparing the Mounting Area

Before you mount the scanner, make sure you have all the necessary materials. Then confirm that the scanner fits your vehicle's mounting area. This scanner is a DIN-E size unit that requires a 2-inch high by 6 11/16-inch wide by 5 1/2-inch deep (50 x 170 x 140 mm) mounting area.

Note: If the mounting area is too large, you might be able to mount the scanner with an in-dash installation kit, available at your local RadioShack store. Follow the installation kit's instructions to mount the scanner.

Caution: Be sure to avoid obstructions behind the mounting surface.

Follow these steps to mount the scanner in your vehicle.

1. Choose a mounting location, then use the supplied mounting bracket as a template to mark the positions for the mounting screw holes.

add illustration.

2. In the marked positions, drill holes slightly smaller than the supplied screws.

Caution: Be careful not to drill into objects behind the mounting surface.

3. Attach the mounting bracket to the mounting location using the supplied screws and lock washers.

add illustration.

4. Place the scanner into the bracket (as shown), slide a rubber washer between the bracket and each mounting hole, then attach the scanner to the mounting bracket using the supplied mounting knobs.

add illustration.

5. Connect the antenna's cable to the ANT jack on the back of the scanner.

add illustration.

Note: If the antenna cable's connector does not fit in the ANT jack, you might also need a Motorola-to-BNC antenna plug adapter, such as RadioShack Cat. No. 278-117.

#### Using Vehicle Battery Power

You can power your scanner using either the supplied DC power cord or an optional DC cigarette lighter power cable such as Cat. No. 270-1534 (not supplied)

Caution: Avoid routing power wires near moving parts or sharp edges.

Follow these steps to connect the supplied DC power cord.

1. Disconnect the cable from your vehicle's negative (-) battery terminal before you begin.

add illustration.

2. Connect the power cord's black wire to your vehicle battery's negative (-) terminal or to a metal part of the vehicle's frame that is not insulated from the frame by a plastic part.

3. Connect the power cord's red wire (with in-line fuse) to a source of voltage that turns on and off with the ignition switch, such as a spare accessory terminal in your vehicle's fuse box.

add illustration.

4. Insert the power cord's barrel plug into the DC 13.8V jack on the back of the scanner.

add illustration.

5. Reconnect the cable to the vehicle's negative (-) battery terminal.

To connect an optional DC cigarette lighter power cable, insert its barrel plug into the DC 13.8V jack on the back of the scanner, then plug the power cable into your vehicle's cigarette-lighter socket.

add illustration.

Caution: If you use a DC cigarette lighter power cable with the scanner, it must supply 12 volts and deliver at least 1 amp of DC automotive power. Its center tip must be set to positive, and its plug must correctly fit the DC 13.8V jack on the back of the scanner. The recommended power cable meets these specifications. Using a power cable that does not meet these specifications could damage the scanner or the power cable.

## USING THE SCANNER AS A BASE STATION

You can place this scanner on a desk, shelf, or table to use it as a base station.

### Using Standard Power

To power the scanner from an AC outlet, you need an AC adapter (not supplied), such as Cat. No. 273-1652.

Caution: You must use an AC adapter that supplies at least 12 volts DC power and delivers at least 500 milliamps. Its center tip must be set to positive, and its plug must properly fit the scanner's DC 13.8V jack. The recommended AC adapter meets these specifications. Using an adapter that does not meet these specifications could damage the scanner or the adapter.

1. Connect the adapter's 5.5 mm outer diameter/2.1 mm inner diameter tip to the adapter's cord and set the barrel plug's tip to positive.
2. Insert the adapter's barrel plug into the DC 13.8V jack on the back of the scanner.
3. Plug the adapter into a standard AC outlet.

add illustration.

4. Connect the antenna's cable to the ANT jack on the back of the scanner.

add illustration.

Note: If the antenna cable's connector does not fit in the ANT jack, you might also need a Motorola-to-BNC antenna plug adapter, such as Cat. No. 278-117.

## CONNECTING AN EXTERNAL SPEAKER

In a noisy area, an optional external speaker might provide more comfortable listening. You can connect an external speaker with a 1/8-inch (3.5 mm) plug to the scanner. Use an 8-ohm external speaker capable of handling 3 watts of power (such as Cat. No. 21-549).

Insert the speaker's plug into the EXT SP jack on the back of the scanner.

add illustration.

Note: Connecting an external speaker disconnects the scanner's internal speaker.

## CONNECTING AN EARPHONE/HEADPHONES

You can connect an optional earphone or pair of headphones with a 1/8-inch (3.5 mm) plug to the scanner. Use an 8-ohm earphone or pair of headphones capable of handling 3 watts of power (such as Cat. No. 33-178 or 20-210).

Insert the earphone's or headphones' plug into the EXT SP jack on the back of the scanner.

add illustration.

Note: Connecting an earphone or pair of headphones disconnects the scanner's internal speaker.

## Listening Safely

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

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

## Traffic Safety

Do not use an earphone or headphones with your scanner when operating a motor vehicle. Doing so can create a traffic hazard and could be illegal in some areas.

If you use an earphone or headphones with your scanner, be very careful. Do not listen to a continuous broadcast. Even though some earphones or headphones let you hear some outside sounds when listening at normal volume levels, they still can present a traffic hazard.

## CONNECTING THE CLONE CABLE

You can transfer the programmed data to and from another PRO-2067 using the supplied clone cable. Connect the cable between each scanner's PC/IF jacks. You can also upload or download the programmed data to or from a PC using an optional PC interface kit (see "Cloning the Programmed Data" on Page XX).

## ABOUT YOUR SCANNER

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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.

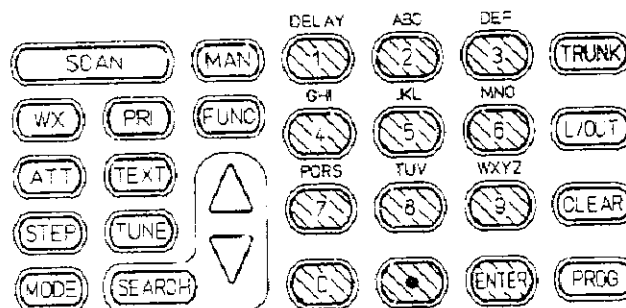
A frequency is the tuning location of a station (expressed in kHz or MHz). To **find** active frequencies, you can use the search function.

You can also search the search banks, which are **preprogrammed** frequencies in the scanner's memory (see "Guide To Frequencies" on Page XX for the frequency list). You can change the search frequency ranges.

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

### A LOOK AT THE KEYPAD

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



SCAN – scans through the programmed channels or ID code.

WX (weather) – scans through the 7 preprogrammed weather channels.

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

STEP – changes the frequency step or displays step frequency during search.

MODE – changes the receive mode.

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

TEXT – lets you input text.

TUNE – tunes to a frequency along with (UP key) or (DN key).

SEARCH – lets you search the ten search banks.

MAN (manual) – stops scanning and lets you directly enter a channel number.

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

(UP key) or (DN key) – selects the search direction during search or tuning to a frequency.

1/DELAY – enters a 1, or programs a 2-second delay for the selected channel/search bank, or inputs characters 0 through 9.

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

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

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

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

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

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



. – enters a decimal point (necessary when programming frequencies), space, or hyphen (in Motorola type I code setting).

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

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

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

ENTER – enters frequencies, text, and so on.

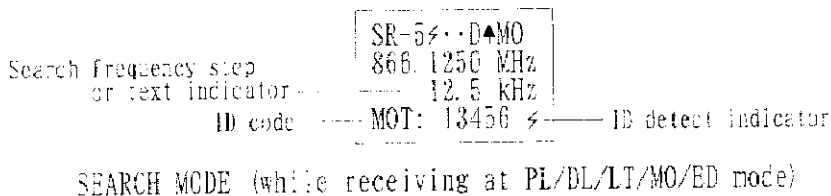
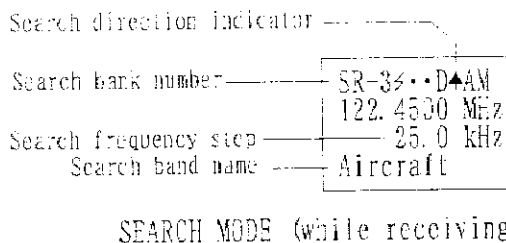
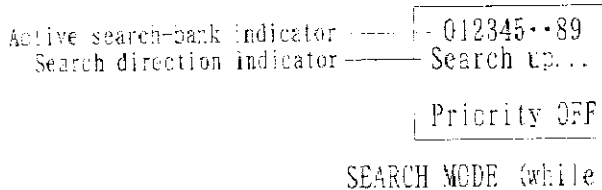
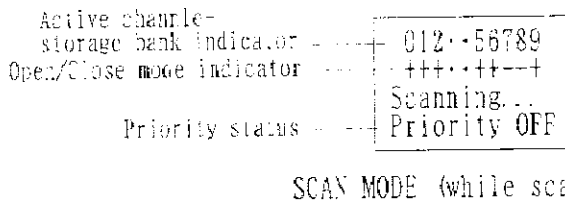
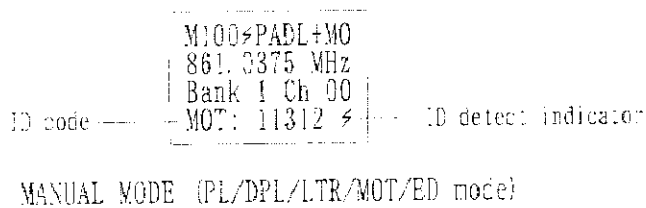
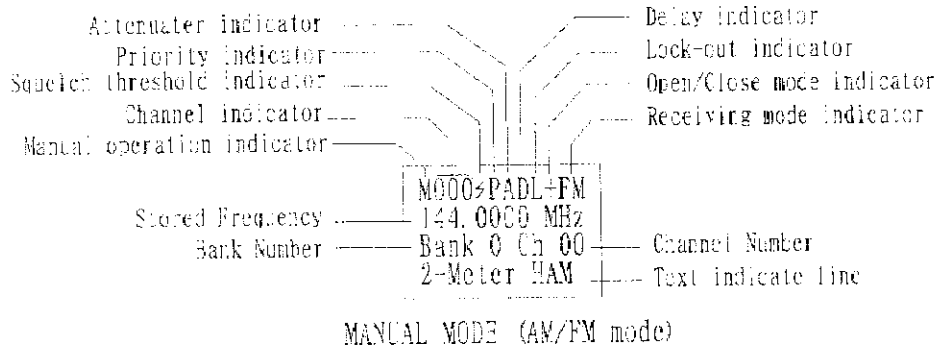
TRUNK – programs the trunking ID code or holds the trunking ID while scanning.

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

CLEAR – clears an incorrect entry.

PROG (program) – programs frequencies into channels.

A LOOK AT THE DISPLAY



## UNDERSTANDING BANKS

### Channel Storage Banks

To make it easier to identify and select the channels you want to listen to, channels are divided into 10 banks of 50 (00 to 49) channels each. Use each channel-storage bank to group frequencies, such as those used by the police department, fire department, ambulance services, or aircraft (see "Guide to the Action Bands" on Page XX). For example, the police department might use four frequencies, one for each side of town. You could program the police frequencies starting with Channel 000 (the first channel in bank 0) and program the fire department frequencies starting with Channel 100 (the first channel in bank 1).

### Search Banks

This scanner is able to search 10 search banks. You can also replace a bank with one of the 60 pre-programmed search bands. (For the default setting, see "Searching a Preprogrammed Frequency Range" on Page XX).

The following list shows the 60 pre-programmed search bands:

Low Freq. (MHz)	Hi Freq. (MHz)	Step (KHz)	Description
118.0000	136.9750	25	Air Band
108.0000	118.0000	25	Air Nav
460.6375	460.8625	25	Airlines
460.8750	460.9750	25	Alarms
944.0000	952.0000	12.5	Broadcast Links
42.9600	43.6800	20	Business
151.9850	153.7250	5	Business
450.9250	452.1875	25	Business
453.9875	454.9875	25	Business
460.9750	462.5500	25	Business
463.1750	465.0000	25	Business
851.0000	866.0000	12.5	Business
935.0000	944.0000	12.5	Business
33.0400	33.9800	20	Fire
29.7000	33.0400	5	Fixed/Mobile

33.9800	42.0200	20	Fixed/Mobile
46.6000	50.0000	20	Fixed/Mobile
928.0000	929.0000	12.5	Fixed
932.0000	935.0000	12.5	Fixed
952.0000	960.0000	12.5	Fixed
462.5500	462.7500	12.5	GMRS/FRS
467.5500	467.7500	12.5	GMRS/FRS
137.0000	144.0000	5	Government
148.0000	150.7750	25	Government
153.7250	156.2500	5	Government
158.6700	159.4650	5	Government
162.0000	173.2250	5	Government
173.4000	174.0000	5	Government
400.0000	420.0000	25	Government
453.0000	453.9875	25	Government
29.0000	29.7000	5	Ham 10 m
50.0000	54.0000	5	Ham 6 m
144.0000	148.0000	20	Ham 2 m
420.0000	450.0000	25	Ham 70 cm
902.0000	928.0000	12.5	Ham/ISM 33cm
150.9650	151.9850	5	Highways
462.9250	463.1750	25	Medical
156.2500	157.4250	25	Marine Band
161.7600	161.9150	25	Marine Band
380.0000	400.0000	50	Military
806.0000	823.9875	12.5	Mobile Units
894.0000	902.0000	2.5	Mobile Units
161.5650	161.7600	5	News Media
173.2250	173.4000	5	News/Film
450.0000	450.9250	12.5	News Media
452.9625	452.9875	25	Newspapers
462.7500	462.9250	25	Paging
929.0000	932.0000	12.5	Paging
42.0200	42.9600	20	Police
44.6000	46.6000	20	Police/Fire
460.0000	460.6375	25	Police/Fire

866.0000	868.9875	12.5	Police/Fire
160.2150	161.5650	15	Railroads
455.0000	460.0000	25	Reptr Inputs
465.0000	470.0000	25	Reptr Inputs
157.4250	158.6700	5	Taxi/Tow
159.4650	160.2150	5	Taxi
452.1875	452.9625	25	Taxi/Busses
470.0000	512.0000	12.5	T-Band
150.7750	150.9650	5	Tow Trucks

**Note:** The steps shown above are default values. You can select any desired step setting.

## OPERATION

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### TURNING ON THE SCANNER AND SETTING SQUELCH

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

add illustration.

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

add illustration.

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

#### Notes:

. To listen to a weak or distant station, turn SQUELCH counterclockwise. If reception is poor, turn SQUELCH clockwise to cut out weak transmissions.

. If SQUELCH is adjusted so you always hear a hissing sound, the scanner does not scan properly.

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

### STORING KNOWN FREQUENCIES INTO CHANNELS

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

Follow these steps to store frequencies into channels.

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

add illustration.

2. Press PROG. M changes to P on the display.

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

If you make a mistake, hold down CLEAR for about 0.5 seconds to delete a single digit and about 1.5 seconds to delete all digits.

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

Notes:

. If you made a mistake in step 3, Invalid Freq briefly appears and the scanner beeps when you press ENTER. 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 151.473, your scanner accepts it as 151.470.

. Press FUNC then press DELAY/1 to turn the delay function on or off. If you want the scanner to pause 2 seconds on this channel after a transmission ends before it proceeds to the next channel, see "Using the Delay Function" on Page XX. The scanner also stores this setting in the channel.

5. If necessary, change the receiving mode. If you select PL or DPL mode, enter the PL or DPL code by pressing STEP (to move through the codes upward) or FUNC then press STEP (to move through the codes downward).

6. To program the next channel in sequence, press PROG and repeat Steps 3 through 5.

## Text Input

You can enter 12 characters as text in each channel. To input the text, follow these steps:

1. Press **MAN**, enter the channel number where you want to enter the text, then press **MAN** again. **M** and the channel number appear at the upper left corner on the display (for example: **M100**).
2. Press **PROG**. **M** changes to **P** on the display.
3. Press **TEXT**. The cursor appears.
4. Enter the text using the numeral keys.

Note: For example input "HAM 6m" as follows:

- "H" Press 4 then press 2.
- "A" Press 2 then press 1.
- "M" Press 6 then press 1.
- "space" Press • .
- "6" Press 1 then press 6.
- "m" Press 6 and **FUNC**, then press 1.

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

## Text for Bank Name

1. Press **PROG** then select channel bank you wish.
2. Press **FUNC** then press 6. The cursor appears at the fourth line on the display.

add illustration.

3. Enter text as above step 4.

Press **ENTER** to shift the text to the fourth line and input the text. The scanner stops scanning and receives the signal, programmed bank name appears at the fourth line on the display.



Note: If the scanner detects ID code in PL, DL, LT, MO, and ED mode, the display changes to the ID number from the bank name.

#### Input List

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

Note: To enter the underlined characters, press FUNC after pressing the numeral key.

#### FINDING AND STORING ACTIVE FREQUENCIES

You can search for transmissions within ten ranges of frequencies, called a search bank. The search bank is divided into 10 search bands. You can change the bands with the 60 pre-programmed search bands in the scanner (see "Search Banks" on Page XX). You can also change the search bank's search ranges manually.

#### Notes:

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

## SEARCHING A PREPROGRAMMED FREQUENCY RANGE

The scanner contains these preprogrammed search ranges, stored in search banks (0-9).

Search Bank	Search Range (MHz)	Description
0	460–460.625	Police
1	153.725–156.000	Police/Fire
2	462.925–463.175	Medical
3	118.000–136.00	Aircraft
4	156.250–157.425	Marine
5	866.000–868.9875	800 MHz
6	50.000–54.000	6 Meter Ham
7	144.000–148.000	2 Meter Ham
8	440.000–450.000	70 cm Ham
9	462.550–462.725	User Bank

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

1. Press SEARCH. The scanner searches active search bank.

add illustration.

Note: To reverse a search direction, press (UP key) or (DN key).

2. Using the number keys, enter the search bank number for each search range you want to select or remove.

3. When the scanner finds an active frequency, it stops searching. To save the frequency into a channel in the channel storage bank (bank 9 only), press FUNC then press ENTER. Stored @ 9xx appears on the display (xx: channel number). Press (UP key) or (DN key) to continue searching for additional active frequencies.

## Notes:

. During search, you can manually change the band mode or frequency step. See "Changing the Receive Mode" on Page XX or "Changing the frequency step" on Page XX.

- . If bank 9 in the channel storage banks does not contain any empty channels, Bank 9 full, appears on the display's lower line.
- . To pause the search, press FUNC then press STEP. **\*\* PAUSED \*\*** appears on the display and the scanner stops frequency search. To start search again, press FUNC then press STEP again or just press SEARCH.

#### Storing a Frequency to a Specified Channel

Follow the steps to store a frequency into a specified channel.

1. When the scanner stops on the frequency, press FUNC.
2. Press TUNE.
3. Press MAN. And select specified channel using number key then press MAN again.
4. Press PROG.
5. Press FUNC, then press TUNE to store the frequency.
6. If desired, press SEARCH to return to the search mode.

#### Changing a Search Range with One of the 60 Preprogrammed Ranges

You can replace the search range with one of the 60 preprogrammed ranges.

1. Press FUNC then press SEARCH to enter search program mode. PSR and the search bank number of the **current range** appear at the display's upper left corner.

add illustration.

2. Press (UP key) or (DN key) to select the desired search bank you want to replace.

3. Press FUNC then press 5. ?SR and the search bank number appear at the display's upper left corner.

add illustration.

4. Press (UP key) or (DN key) key to select the preprogrammed search range.

5. Press ENTER to replace the search range.

### Changing a Search Range Manually

Follow these steps to change the search range manually:

1. Press FUNC then press SEARCH to enter search program mode. PSR and search bank number appear at the display's upper left corner.

2. Press (UP key) or (DN key) key to select the search bank number.

3. Use the number keys to enter the lower range you want to search and store, then press ENTER to store the frequency.

4. Use the number keys to enter the higher range you want to search and store, then press ENTER again to store the frequency.

#### Notes:

. If you enter a higher frequency first then enter a lower frequency, the scanner automatically exchanges the frequencies on the display. It displays the lower frequencies first and the higher frequency second.

. If necessary, press TEXT and the appropriate number keys to input the character.

### SCANNING THE CHANNELS

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

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

The scanner scans through all channels (except those you have locked out) in the active banks (see "Locking Out Channels, Frequencies and Trunking ID" on Page XX and "Turning Channel-Storage Banks Off and On" below).

#### Turning Channel-Storage Banks Off and On

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

#### Notes:

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

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

#### TUNING THE FREQUENCY MANUALLY

If desired, you can locate a frequency manually. The frequency found while searching can be watched.

To tune to the frequency, follow these steps:

1. Press TUNE.
2. Use the number keys to enter the frequency.
3. Press ENTER.
4. Press (UP key) to move 1 step up. Press (DN key) to move 1 step down. To move up or down in 1 MHz, press FUNC then press (UP key) or (DN key). To save the frequency into a channel (bank 9 only), press FUNC then press ENTER. Stored @ 9xx appears on the display (xx: channel number).

When the scanner stops on a frequency while searching, press FUNC then press TUNE. Press (UP key) or (DN key) to tune the frequency.

Notes:

- . The PRO-2067 cannot change the step frequency when it is in the TUNE mode.
- . You can change the receiving mode in the TUNE mode.

## DELETING FREQUENCIES

1. Press MAN.
2. Use the number keys to enter the channel has the frequency you want to delete.
3. Press MAN again.
4. Press PROG to enter the program mode. M changes to P on the display.
5. Press FUNC.
6. Press CLEAR. The frequency number changes and the display shows 0.0000 MHz.

## 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. Your scanner should stop within a few seconds on your local weather broadcast.

## WX Alert Feature

This scanner can detect the weather alert tone. The WX alert warns you of serious weather conditions by sounding an alarm if the weather service broadcasts the weather alert tone.

To listen to the alert tone, press FUNC then press WX while you are listening to the WX channel. The scanner scans WX channels and WX Standby appears on the display. If the scanner detects the weather alert, it sounds an alarm. Press any key to mute the alarm. To cancel the weather alert operation, press FUNC then press WX again.

## Receiving WX SAME

If there is Specific Area Message Encoding (SAME code) while receiving a weather channel, the scanner sounds an alarm and indicates the weather event on the display. Press any key to cancel the alarm and listen to the reports.

When the unit receives a message that does not conform to the listed codes, the message Tune to TV or Radio appears on the display.

To obtain SAME codes, you may visit the National Weather Service web site at:

<http://www.nws.noaa.gov/nwr/indexnw.htm#sametable>.

**Note:** When you receive a same alert always tune to a local TV or radio station for details on the nature, severity and time period of the alert.

## SPECIAL FEATURES

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## USING THE DELAY FUNCTION

Many agencies use a two-way radio system that 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 or frequencies. Then, when the scanner stops on the channel or frequency, D appears on the display and the scanner continues to monitor the channel/frequency for 2 seconds after the transmission stops before it resumes scanning or searching.

You can program a 2-second delay in any of these ways:

- . If the scanner is scanning and stops on an active channel, quickly press FUNC then press DELAY before it starts to scan again.
- . If the desired channel is not selected, manually select the channel then press FUNC then press DELAY.
- . If the scanner is searching and also stopped or paused, press FUNC then press DELAY to set a delay in a search bank.

Note: Delay ON is the default when entering channels.

## LOCKING OUT CHANNELS, FREQUENCIES AND TRUNKING ID

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

## Locking Out Channels

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



### Reviewing the Lock-Out Channels

To review the channels you locked out, press **MAN**. Press **FUNC** then press **L/OUT**. As you press **FUNC** then press **L/OUT**, the scanner displays all locked-out channels.

### Locking out Frequencies

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

#### Notes:

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

### Reviewing Locked-Out Frequencies

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

1. Press **SEARCH** to start search.
2. Press **FUNC** then press **L/OUT**. The locked-out frequency appear on the display. If the search bank has no locked-out frequency, **L/O list is empty.** appears on the display.
3. Select search bank pressing **FUNC** then press (**UP** key).
4. As you press (**UP** key), the scanner displays all locked-out frequencies within a bank.

add illustration.

### Clearing a Locked-Out Frequency

To clear the locked-out frequency, select the locked-out frequency to use the locked-out frequencies review function, then press CLEAR. The frequency unlock and Unlocked appear on the display about 2 seconds. Then next locked out frequency appears. If all locked out frequency clears within a bank, L/O list is empty. appears on the display.

### Clearing All Lock-Out Frequencies in One Search Bank

1. Press SEARCH.
2. Turn on only one search bank, the one in which you want to clear all locked-out frequencies.
3. Press FUNC, then press 4. Confirm list clear? 1=YES Press other key for NO. appears on the display. Press 1 to clear all lock-out frequencies and List cleared appears on the display for about 2 seconds. Press any key other than 1, to cancel clear.

### PRIORITY

With the priority feature, you can scan through programmed channels and still not miss an important or interesting call on a specific channel. When a channel is selected as the priority channel and 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.

The scanner is preset to select Channel 00 in Bank 8 as the priority channel. You can program a different channel as the priority channel. Also, you can program a weather channel as the priority channel.

Note: If you program a WX channel as the priority channel, the scanner stays the priority channel only when the scanner detects the weather alert tone.

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

1. Press MAN.

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

3. Press **FUNC** then press **PRI**. **Pri** appears on the display to the right of the frequency.

add illustration.

Notes:

- . Priority **does** not operate while **trunking** frequencies are being received.
- . This scanner **cannot** set the **priority channel** if the receive mode is **LT**, **MO**, or **ED**.

Follow these steps to program a **WX** 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 press **PRI**. **Pri** appears on the display to the right of the frequency.

To turn on the priority feature, press **PRI** while scanning. **Priority ON** (**Priority WX** if the priority channel is **WX** channel) appears about 3 seconds and **P** appear on the display. The scanner checks the priority channel every 2 seconds. It stays on the channel if there is activity. **Pri** appears and **S** or **M** changes to **P** on the display.

To turn off the priority feature, press **PRI**. **Priority OFF** appears on the display and **P** disappears from the display.

Note that the priority channel always acts if it was in close mode, regardless of the open closed setting for the bank. This means that if the priority channel is **PL**, and has **PL** code stored for it, the priority function will not activate unless the priority signal has the matching **PL** code.

#### ABOUT CTCSS/DCS

Continuous Tone Coded Squelch System (CTCSS) and Digital Coded Squelch (DCS) are two methods used to prevent interference by other radio communications.

CTCSS system is a.k.a. PL (Private Line) and DCS is a.k.a. DPL (Digital Private Line). Moreover, the DCS identifies the transmission by a three-digit digital code in the DPL mode instead of the tone.

PL

PL codes are low frequency audio tones that are used to differentiate different users on the same channel.

PL codes are displayed according to the EIA standard CTCSS tones. These tones range from 67.0 Hz to 254.1 Hz. PL codes are displayed directly as a frequency. The user cannot enter the code directly.

DPL (Indicated as DL on the display)

DPL works the same as PL but the difference is whether the tone or the digital code is used. DPL codes structure allows a maximum of 4096 codes. however, only about 100 codes are actually used.

DPL codes are displayed as:

Dxxx – where xxx is an octal code, for example: D411. This is the industry standard. The user does not enter the code directly. The STEP key is pressed in channel programming mode to scroll through the range of allowable values.

Open and Closed Mode

PL, DPL, LTR, MOT, and ED modes are communication systems that some type of closed squelch. The scanner scans signals of all the modes when it is set to open mode. When it is set to the closed mode, the scanner receives signals under the following conditions:

- . When the signal is in the AM or FM mode.
- . When the signal in the PL or DPL mode, the signal's ID code must match the programmed ID code. (When the ID code is set to NONE, the scanner receives all signals on the channel.)
- . When the signal is in the LT, MO or ED mode, the signal's ID code must match programmed ID code. (When ID code is set to NONE in LT and ED mode, the scanner receives all signals on the channel.)

- . Closed mode allows you to select which users or talk groups the scanner will receive.
- . When the signal is in the receive mode, the channel memory is not the same as the trunk memory's mode.

add illustration.

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

#### Open vs. Closed Mode

During scanning, the voice frequency band code is used in the PL, DL, LT, MO, and ED modes in addition to the normal squelch. When a bank is in closed mode, this scanner receives only transmissions with specified ID codes. When transmissions that have no ID code, or an ID code that does not match with the scanner's ID code, the scanner does not receive the signal. FM and AM mode operate in both Closed or Open mode. In open scanning mode, all transmissions are accepted. Decoded IDs are displayed.

To change the OPEN/CLOSE mode, follow these steps:

1. Press MAN.
2. To select the channel-storage bank, press FUNC and (UP key) or (DN key).
3. Press FUNC then press 2. The display shows the message: "Bank OPEN" or "Bank CLOSED."
4. After that message disappears, the 10<sup>th</sup> rightmost digit at the top line of the display changes from + to – or from – to +.

## 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 transmits and trunked systems do not operate in the preset mode. If you try to listen to a transmit when the scanner is not set to the correct receive mode, the transmit might sound weak or distorted.

If you want to listen to and watch the private line or trunking transmission in the closed mode, you need to change the receive mode.

You can change a receive mode by pressing MODE. The receive mode changes as follows:

Display	Description
AM	AM Mode
FM	FM Mode
PL	FM Mode, Private Line (with 67.0–254.1 Hz PL code).
DL	FM Mode, Digital Private Line (with 3-digit DPL code).
LT	FM Mode, LTR Trunking System (with 6-digit ID code).
MO	FM Mode, Motorola Trunking System (with 4 or 5-digit ID code).
ED	FM Mode, EDACS Trunking System (with 4-digit ID code).

## CHANGING THE FREQUENCY STEP

The scanner searches at a preset frequency step for each frequency range. Press STEP to change the step increment when moving between frequencies of a search band.

Changeable frequency steps your scanner uses for each frequency range.

Range (MHz)	Search Step (kHz)
29.000-54.000	5, 10, 15, 20, 25, 30, 50, 100
108.000-136.9875	12.5, 25, 50, 100
137.000-174.000	5, 10, 15, 20, 25, 30, 50, 100
380.000-512.000	12.5, 25, 50, 100
806.000-823.9875	12.5, 25, 50, 100
849.000-868.9875	12.5, 25, 50, 100
894.000-960.000	12.5, 25, 50, 100

## USING THE ATTENUATOR

To reduce interference or noise caused by strong signals, you can reduce the scanner's sensitivity to these signals. Press ATT until A appears on the display to reduce the scanner's sensitivity.

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

To turn off the attenuator, press ATT again. A disappears from the display.

## TURNING THE KEY TONE ON AND OFF

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

1. If the scanner is on, turn VOLUME OFF/MAX counterclockwise until it clicks to turn it off.
2. Turn VOLUME OFF/MAX clockwise to turn it on. Welcome To Multi-System Trunking appears on the display.
3. To turn on the key tone, press 1 while the display shows Welcome To Multi-System Trunking. To turn off the key tone, press 2 while the display shows Welcome To Multi-System Trunking.

## CHANGING THE DISPLAY CONTRAST

1. Press MAN.
2. Press FUNC then press 9. Use Up/Down keys to set contrast. appears on the display.
3. Press (UP key) or (DN key) key 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-2067 using the supplied clone cable. You can also upload or download the programmed data to or from a PC using an optional PC interface kit.

To clone the data, follow these steps.

1. Turn on the power of both scanners.
2. Connect the supplied clone cable to each scanner's PC/IF jack.
3. Press (UP key). Yes=1 and No=Other appear.
4. Press 1 to send the data to the other unit or press any other key to cancel the operation.
5. The scanner sends the data to the other.

To exit the clone mode, remove the cable. After the cable is removed, the scanner executes the software reset.



## TRUNK TRACKING

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Your scanner is designed to track Motorola(R) Type I and Type II (such as Smartnet and Privacy Plus) and hybrid analog trunking systems, plus GE/Ericsson (EDACS(R)) and EF Johnson (LTR(R)) type systems, which are extensively used in many communication systems.

Trunking systems allocate a few frequencies among many different users. When the mobile unit transmits a signal, one frequency is chosen from among the allocated frequencies in that trunking system. The ID code by which the user is identified is sent with the signal at the same time.

To receive trunking signals, you must store all the trunking group frequencies in one bank. (See "Storing Known Frequencies into Channels" on Page XX.) It is necessary to input ID codes in the ID memory. (See "Finding and Storing Active Frequencies" on Page XX and "Setting and Receiving Trunking Signals Without a Station ID Code" on Page XX.)

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

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

## TRUNKING ID MEMORY

### Programming Trunking ID Codes

You can program up to 100 trunking ID codes in each channel storage bank. (Total 1000 ID codes). If the scanner receives the signal in the LTR, Motorola, and EDACS, and its ID code matches with the programmed ID code in the scanner, it receives the signal in closed mode. However, in open mode you can receive the trunking signal without knowing its ID code.

If ID is stored with text name, name is displayed when ID code is received.

## LTR Trunking Codes

LTR trunking codes have a number of fields, but only the area code, home repeater, and user ID are significant in identifying the user. The talk group ID codes are displayed while receiving a transmission and you can save it in memory.

Area code – 0 or a 1

Home repeater – 01 through 20

User ID – 000 through 254

The LTR code is a six-digit numeric field:

AHHUUU

Where A is the area code, HH is the home repeater and UUU is the user code. Correct ranges are checked upon entry.

## Motorola Trunking Codes

Motorola sub-fleet number for Type I or talk group ID codes for Type II is displayed while receiving a transmission and you can save it in memory. Mainly Motorola Type II is used in the market. A 4- or 5-digit number is used for the Type I sub-fleet number. For example: 100-1, 100-2, and 100-10.

Type II code is a 5-digit number that must be divisible by 16.

### Examples of Type II Code

00016    00048    00272

16016    17616    19616

If you program an incorrect ID code, then the number is automatically rounded to the nearest correct number.

## EDACS Trunking Codes

EDACS talk group ID codes are also displayed while receiving a transmission and you can save it in memory. It is a decimal number from 0001 to 4095. If you enter an in-correct code, the scanner displays Invalid ID.

## RECEIVING THE TRUNKING SYSTEM

### How to Set Motorola Type I Systems

To receive Type I trunking systems, a fleet map is required to set the block number and size code. Your PRO-2067 has a Type II Talk Group ID's default setting. However, you can also scan the Type I Trunking System.

In the Type I System, the address information for all its talk group ID's is divided into 8 equal-size blocks, from 0 to 7, and a size code is assigned to each block.

When you set up your scanner to track a Type I System, you must choose the size code based on the block number. You can get the block number through the Internet or published books. Sometimes the size code does not come with the block code; however, normally the size codes are arranged by the block number from 0 to 7.

After you choose the size code you can start programming.

Note: If you select size code S-12, S-13, or S-14, these restrictions apply:

- S-12 can only be assigned to Blocks 0, 2, 4, or 6.
- S-13 can only be assigned to Blocks 0 and 4.
- S-14 can only be assigned to Block 0.

Since these size codes require multiple blocks, you will be prompted for the next available block when programming a fleet map. For example, if you assign Block 0 as an S-12, the scanner prompts you for Block 2, the next block available, instead of Block 1. And if you assign Block 0 as an S-14, you would not see another prompt because it uses all available blocks.

### Block and Size Codes

Each size code defines the number of fleets and ID's. For example, you can see in the following table that a size code S-4 has one fleet and a total of 512 individual IDs and uses 1 block of 0 to 7.

Size	Fleets	Sub-fleets	ID's	Block Used
S-0		Reserved for Type II		
S-1	128	4	16	1
S-2	16	8	64	1
S-3	8	8	128	1
S-4	1	16	512	1
S-5	64	4	32	1
S-6	32	8	32	1
S-7	16	4	64	1
S-8	16	4	128	1
S-9	8	4	256	1
S-10	4	8	256	1
S-11	2	16	256	1
S-12	1	16	1024	2
S-13	1	16	2048	4
S-14	1	16	4096	8

If you could not obtain size code lists, try some of these common size codes.

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	S3	
5	S11	S4	S4	S4	S4	—	S4	S3
6	S11	S4	S12	S4	S4	S12	S4	S4
7	S11	S4	—	S4	S4	—	S4	S4

BLOCK	9	Size Code						
		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	S1	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	—	—	—

#### Setting and Receiving Trunking Signals Without a Station ID Code

1. Press PROG.
2. Press FUNC, (UP key), or (DN key) to select a bank.

Note: We suggest you use one bank for one trunking mode. Do not mix different trunking modes in one bank

3. Select the desired channel where you want to enter the first frequency for example 00. If you want to enter an EDACS system frequency then you must match the system control channel and program channel in your PRO-2067 in the correct order. For example the system control channel 1 has to be programmed in channel 01, channel 2 is in channel 02 in your PRO-2067. Do not start to program from channel 00.
4. Enter a frequency into the channel and press ENTER.
5. Press MODE to select LT, MO, or ED mode.
6. Press (UP key) to select the next channel.
7. Repeat steps 4 and 6 until all system frequencies are entered.

8. Select open or closed mode. + or – appears just before the receiving mode. For example +LT. This is Open and LTR mode setting. Turn on Open mode by pressing FUNC then 2 if necessary. Press FUNC and 2 to toggle between the Open and Closed mode.

9. Press TRUNK to enter the ID program mode.

10. Press MODE to select LT for EF Johnson, MO for Motorola or ED for EDACS (GE/Ericsson) system to scan.

11. If you want to receive a Motorola Type 1 system, then you need to set the size code in this step. If you want to receive another systems, you can skip this section and go to step 12.

Program of Type I ID's

a. Press PROG

b. Press TRUNK.

c. Press FUNC.

d. Press 8 then you can see the following indication on the display.

add Illustration.

e. Enter the size code referring to the instruction on the display (see "Block and Size Codes" on page XX). Enter the size code "X" and press ENTER for each entry. If you made input mistake then press CLEAR and re-enter the correct size code.

f. If you want to confirm the input, repeat Steps a-e and press ENTER. Each time you press ENTER, you can confirm the size code. If you find an error, press CLEAR and begin again at Step a.

Note: To cancel the Motorola Type 1 programming, press TRUNK.

12. Press SCAN to start scanning.

13. During scanning, press number keys to turn banks on and off. For the best trunk scanning, turn on only the banks that you want to receive the trunking mode.

14. If it detects a station then the station ID is indicated at the bottom line of the display as MO: XXXX or LT: XXXX. To store the station ID codes, press TRUNK during receiving the signal. Then the bottom line changes to ID stored. This means the code is stored and if the code starts from receiving mode as MO: or LT: then it is not stored yet.

15. Press PROG to confirm that the programmed receive mode matches the transmission's receive mode. If it matches then T appears. If it does not match, the key operation is invalid.

add illustration.

Notes:

. Default setting of the bank is for Motorola Type II. However, after you set Type I and if you want to return to Type II, press 15 at step e.

. During you receive Motorola trunk system bank after you set the trunk ID bank to Motorola, we suggest you to lock-out the control channel to avoid interference. However your scanner is designed automatically cancel the lockout when you once turn off the power to avoid miss communications on the channel. You can judge the control if the channel is buzz sound.

#### Storing Known Station ID Codes to ID Bank

1. Press PROG.
2. Press TRUNK.
3. To select the bank you want to store the ID, press FUNC, then press (UP key) or (DN key).
4. Press MODE to select LT, MO, or ED mode.
5. Enter the numeric ID code and press ENTER. If necessary, use the decimal point for a hyphen.

Note: If you made a mistake in Step 5, Invalid ID. appears and the scanner beeps when you press ENTER. Start again at Step 3.

6. Press TEXT and enter the text name for the ID and press ENTER.

7. To store the next ID memory in sequence, press (UP key) and repeat Steps 5 and 6 to enter more ID's

8. Press SCAN to start scanning.

Notes for EDACS receiving:

1. During scanning with the signal in EDACS mode, the audio is automatically muted until the scanner receives the signal on the working channel. Therefore normally adjust SQUELCH to the threshold position.

2. If you cannot receive an EDACS signal, then confirm if you can receive it in MANUAL mode. One of the channels in EDACS system is used as the control channel and changes frequency. If you receive the control channel while changing the channels, you hear the stream of the data sound. If the scanner receives the data channel then display indicates ED: CTR-01 and the signal mark at the bottom line. The signal mark appears only when the scanner detects the data. If there is no signal mark but the sound then try to find a position where you can receive strong signal that turns on the signal mark or try to use an external out door antenna. When a control channel is received, CTR-1 appears and then CTR-1 changes to the ID code when the ID code of the control channel is decoded. After making sure that your PRO-2067 decodes the code and the signal mark is on the display, then press SCAN to wait for incoming signals.

3. EDACS system uses digital code for the trunking system control. To decode the digital code, the system needs better signal to noise ratio than other trunking systems such as LTR or Motorola system. Therefore the service area is some time smaller than others. So that if you want to receive EDACS more steady then we suggest you to use an external antenna matched for the frequency.

Open or Close Trunking Mode

Open mode can be selected on a per-bank basis. In open trunking mode, the ID list is used to look up ID names, but scanning will stop on any ID code. When closed, scanning will stop only on signals that have an ID code that is found in the ID list for the bank.



## ID Hold

You can set your scanner to follow a trunking signal, which you wish to track while scanning. Hold down TRUNK more than 2 seconds. ID hold ON. appears on the display.

add illustration.

## Trunking Banks

Any bank can be a trunking bank, and more than one bank can be trunking banks at the same time.

To enter an EDACS frequency, the system channel number must match the channel where you want to program. This is very important for EDACS and if the system channel does not match with your receiving channel then it can not receive EDACS communications.

To be a trunking bank, one or more channels must be programmed in the bank with a trunking mode (LTR, Motorola or EDACS). In addition, the bank's trunking mode (also LTR, Motorola or EDACS) must be the same as the trunking channel's mode.

## Locking Out Trunking ID Code

To lock out a trunking ID, follow these steps:

1. Press PROG.
2. Press TRUNK.
3. Use (UP key), (DN key) or FUNC to select the ID code. Press (UP key) or (DN key) to move ID memory and press FUNC then press (UP key) or (DN key) to move bank.
4. Press L/OUT to lock out the ID. L appears on the display.
5. To remove the lock out from trunking ID, manually select the ID memory, and press L/OUT until L disappears from the display.

## Reviewing Locked-Out ID

To review the ID code you locked out within a bank, follow these steps:

1. Press PROG then press TRUNK.
2. Press FUNC then press L/OUT. The locked out ID appears on the display. If the ID memory bank has no locked out ID, you hear the low beep tone.
3. Select search bank pressing FUNC then press (UP key) or (DN key).
4. As you press FUNC then press L/OUT, the scanner displays all locked-out frequencies within a bank.

## CLEARING TRUNKING ID CODE

1. Press PROG.
2. Press TRUNK.
3. Use the FUNC and (UP key) or (DN key) to select the ID code to clear it.
4. Press FUNC then press CLEAR.

## Clearing All ID Codes in One Bank

You can clear all ID codes within a bank. This lets you quickly delete all trunking ID code from a bank if, for example, you want to use the bank to store a different set of trunking ID codes.

1. Press PROG.
2. Press TRUNK to enter ID memory mode.
3. Select ID bank using FUNC, (UP key) or (DN key).

4. Press FUNC, then press 3. Confirm list clear? 1=YES Press other key for NO. appears on the display.

5. Press 1 to clear the all trunking ID codes within a bank.

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

## A GENERAL GUIDE TO SCANNING

=====

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

### Guide To Frequencies

#### US Weather Frequencies

162.400 162.475 162.525  
 162.425 162.500 162.550  
 162.450

#### 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	29.000-29.7000
6-Meter	50.000-54.000
2-Meter	144.000-148.000
70-cm	420.000-450.000
33-cm	902.000-928.000

#### Birdie Frequencies

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

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

birdie frequencies will add

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

## GUIDE TO THE ACTION BANDS

### Typical Band Usage

#### VHF Band

Low Range	29.00–50.00 MHz
6-Meter Amateur	50.00–54.00 MHz
U.S. Government	137.00–144.00 MHz
2-Meter Amateur	144.000–148.00 MHz
High Range	148.00–174.00 MHz

#### UHF Band

Military Aircraft	380.00–384.00 MHz
U.S. Government	406.00–420.00 MHz
70-cm Amateur	420.00–450.00 MHz
Low Range	450.00–470.00 MHz
FM-TV Audio Broadcast, Wide Band	470.000–512.00 MHz
800 Band Law Enforcement	806.00–824.00 MHz
Conventional Systems	851.00–856.00 MHz
Conventional/Trunked Systems	856.00–861.00MHz
Public Safety	866.00–869.00 MHz
Trunked Private/General	894.00–960.00 MHz

## Primary Usage

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

### VHF Band

Activities	Frequencies
Government, Police, and Fire	153.785–155.980 MHz
Emergency Services	158.730–159.460 MHz
Railroad	160.000–161.900 MHz

### 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 the RadioShack "Police Call," "Aeronautical Frequency Directory," and "Maritime Frequency Directory" 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
CSB	Conventional Systems
CTSB	Conventional/Trunked Systems
FIRE	Fire Department
HAM	Amateur (Ham) Radio
GOVT	Federal Government
GMR	General Mobile Radio
GTR	General Trunked
IND	Industrial Services (Manufacturing, Construction, Farming and Forest Products)
MAR	Military Amateur Radio
MARI	Maritime Limited Coast (Coast Guard, Marine Telephone, Shipboard Radio and Private Stations)
MARS	Military Affiliate Radio System
MED	Emergency/Medical Services
MIL	U.S. Military
MOV	Motion Picture/Video Industry
NEW	New Mobile Narrow
NEWS	Relay Press (Newspaper Reporters)
OIL	Oil/Petroleum Industry
POL	Police Department
PUB	Public Services (Public Safety, Local Government and Forestry Conservation)
PSB	Public Safety
PTR	Private Trunked
ROAD	Road & Highway Maintenance
RTV	Radio/TV Remote Broadcast Pickup
TAXI	Taxi Services
TELB	Mobile Telephone
TELC	Cordless Phones
TELM	Telephone Maintenance
TOW	Tow Trucks
TRAN	Transportation Services (Trucks, Tow Trucks, Buses, Railroad, Other)
TSB	Trunked Systems

TVn	FM-TV Audio Broadcast
USXX	Government Classified
UTIL	Power & Water Utilities
WTHR	Weather

## HIGH FREQUENCY (HF)

## 10-Meter Amateur Band

29.000–29.700           HAM

## VERY HIGH FREQUENCY (VHF)

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

29.900–30.550	GOVT, MIL
30.580–31.980	IND, PUB
32.000–32.990	GOVT, MIL
33.020–33.980	BUS, IND, PUB
34.010–34.990	GOVT, MIL
35.020–35.980	BUS, PUB, IND, TELM
36.000–36.230	GOVT, MIL
36.250	Oil Spill Cleanup
36.270–36.990	GOVT, MIL
37.020–37.980	PUB, IND
38.000–39.000	GOVT, MIL
39.020–39.980	PUB
40.000–42.000	GOVT, MIL, MARI
42.020–42.940	POL
42.960–43.180	IND
43.220–43.680	TELM, IND, PUB
43.700–44.600	TRAN
44.620–46.580	POL, PUB
46.600–46.990	GOVT, TELC
47.020–47.400	PUB
47.420	American Red Cross
47.440–49.580	IND, PUB
49.610–49.990	MIL, TELC



## 6-Meter Amateur Band—(50–54 MHz)

50.000–54.000	HAM
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## Aircraft Band—(108–137 MHz)

108.00–121.490	AIR
121.500	AIR Emergency
121.510–136.975	AIR

## U.S. Government Band (137–144 MHz)

137.000–144.000	GOVT, MIL
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## 2-Meter Amateur Band (144–148 MHz)

144.000–148.000	HAM
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## VHF High Band (148–174 MHz)

148.050–150.345	CAP, MAR, MIL
150.775–150.790	MED
150.815–150.980	TOW, Oil Spill Cleanup
150.995–151.475	ROAD, POL
151.490–151.955	IND, BUS
151.985	TELM
152.0075	MED
152.030–152.240	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, MAR
157.450	MED
157.470–157.515	TOW

157.530–157.725	IND, TAXI
157.740	BUS
157.770–158.100	TELB
158.130–158.460	BUS, IND, OIL, TELM, UTIL
158.490–158.700	TELB
158.730–159.465	POL, PUB, ROAD
159.480	OIL
159.495–161.565	TRAN
161.580–162.000	OIL, MARI, RTV
162.0125–162.350	GOVT, MIL, USXX
162.400–162.550	WTHR
162.5625–162.6375	GOVT, MIL, USXX
162.6625	MED
162.6875–163.225	GOVT, MIL, USXX
163.250	MED
163.275–166.225	GOVT, MIL, USXX
166.250	GOVT, RTV, FIRE
166.275–169.400	GOVT, BIFC
169.445–169.505	Wireless Mikes, GOVT
169.550–169.9875	GOVT, MIL, USXX
170.000–170.150	BIFC, GOVT, RTV, FIRE
170.175–170.225	GOVT
170.245–170.305	Wireless Mikes
170.350–170.400	GOVT, MIL
170.425–170.450	BIFC
170.475	PUB
170.4875–173.175	GOVT, PUB, Wireless Mikes
173.225–173.5375	MOV, NEWS, UTIL, MIL
173.5625–173.5875	MIL, Medical/Crash Crews
173.600–173.9875	GOVT

#### ULTRA HIGH FREQUENCY (UHF)

U. S. Government Band (406–420 MHz)	
406.125–419.975	GOVT, USXX

## 70-cm Amateur Band (420–450 MHz)

420.000–450.000 HAM

## Low Band (450–470 MHz)

450.050–450.925	RTV
451.025–452.025	IND, OIL, TELM, UTIL
452.0375–453.00	IND, TAXI, TRAN TOW, NEWS
453.0125–454.000	PUB, OIL
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)

(Channels 14 through 69 in 6 MHz steps)

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

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

## Conventional Systems Band – Locally Assigned

851.0125–855.9875 CSB

Conventional/Trunked Systems Band – Locally Assigned

856.0125–860.9875           CTSB

Trunked Systems Band – Locally Assigned

861.0125–865.9875           TSB

Public Safety Band – Locally Assigned

866.0125–868.9875           PSB

33-Centimeter Amateur Band (902–928 MHz)

902.000–928.000           HAM

Private Trunked Band

935.0125–939.9875           PTR

General Trunked Band

940.0125–940.9875           GTR

### FREQUENCY CONVERSION

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

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

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

$$30.62 \text{ (MHz)} \times 1000 = 30,620 \text{ kHz}$$

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

$$127,800 \text{ (kHz)} \div 1000 = 127.8 \text{ MHz}$$

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

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

## TROUBLESHOOTING

=====

If you have problems, 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 on but will not scan.	SQUELCH is not adjusted correctly.	Turn SQUELCH clockwise.
Scanner is totally inoperative.	No power.	Check the power cable or make sure the AC adapter or DC cigarette lighter power cable is connected properly.
Poor or no reception.	An antenna is not connected or connected incorrectly.	Make sure an antenna is connected to the scanner.
	Programmed frequencies are the same as birdie frequencies.	Avoid programming birdie frequencies or only select them manually.
In the scan mode, the scanner locks on frequencies that have an unclear transmission.	Stored frequencies are the same as "birdie" frequencies.	Avoid storing birdie frequencies or only select them manually. See "Birdie Frequencies" on Page XX.
Keys do not work or display changes.	Undetermined error.	Turn the scanner off then on again, or reset the scanner. See "Resetting/Initializing the Scanner" on Page XX.

## RESETTING/INITIALIZING THE SCANNER

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

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

### Resetting the Scanner

1. Turn off the scanner, then turn it on again.
2. Insert a pointed object, such as a straightened paper clip, into the reset opening on the side of the scanner. Then gently press and release the reset button inside the opening.

add illustration.

### Initializing the Scanner

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

1. Turn off the scanner, then turn it on again. Welcome To Multi-System Trunking appears on the display.
2. Press 0 then 1 while the display shows Welcome To Multi-System Trunking. Initializing Please Wait. appears on the display about 25 seconds.

## CARE AND MAINTENANCE

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Your RadioShack PRO-2067 500-Channel Mobile Trunking Scanner is an example of superior design and craftsmanship. The following suggestions will help you care for your scanner so you can enjoy it for years.

Keep the scanner dry. If it gets wet, wipe it dry immediately. Liquids can contain minerals that can corrode the electronic circuits.

Handle the scanner gently and carefully. Dropping it can damage circuit boards and cases and can cause the scanner to work improperly.

Use and store the scanner only in normal temperature environments. Temperature extremes can shorten the life of electronic devices, damage batteries, and distort or melt plastic parts.

Keep the scanner away from dust and dirt, which can cause premature wear of parts.

Wipe the scanner with a damp cloth occasionally to keep it looking new. Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the scanner.

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



## SPECIFICATIONS

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## Frequency Coverage:

Ham	29–30 MHz (in 5 kHz steps)
VHF Lo	30–50 MHz (in 5 kHz steps)
Ham	50–54 MHz (in 5 kHz steps)
Aircraft	108–136.9875 MHz (in 12.5 kHz steps)
Government	137–144 MHz (in 5 kHz steps)
Ham	144–148 MHz (in 5 kHz steps)
VHF Hi	148–174 MHz (in 5 kHz steps)
Ham/Government	380–450 MHz (in 12.5 kHz steps)
UHF Lo	450–470 MHz (in 12.5 kHz steps)
UHF Trunking	470–512 MHz (in 12.5 kHz steps)
UHF Hi	806–823.9875 MHz (in 12.5 kHz steps)
	849–868.9875 MHz (in 12.5 kHz steps)
	894–960 MHz (in 12.5 kHz steps)

Channels of Operation                    500  
 (50 Channels x 10 Banks, 1000 Trunking ID Memories)

Number of Banks                         10

## Sensitivity (20dB S/N):

## FM:

29–54 MHz	0.3 $\mu$ V
108–136.9875 MHz	0.3 $\mu$ V
137–174 MHz	0.5 $\mu$ V
380–512 MHz	0.5 $\mu$ V
806–960 MHz	0.7 $\mu$ V

## AM:

29–54 MHz	1 $\mu$ V
108–136.9875 MHz	1 $\mu$ V
137–174 MHz	1.5 $\mu$ V
380–512 MHz	2 $\mu$ V
806–960 MHz	2 $\mu$ V

## Selectivity:

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

Spurious Rejection (at 154 MHz FM)	40 dB
Scanning Rate	Up to 25 Channels per second
Search Rate	Up to 50 Steps per second
Delay Time	2 seconds
Intermediate Frequencies (IF):	
1 <sup>st</sup>	257.5 MHz
2 <sup>nd</sup>	21.4 MHz
3 <sup>rd</sup>	455 kHz
Priority Sampling	2 seconds
Operating Temperature	-4° to 140° F (-20° to +60° C)
IF Rejection:	
257.5 MHz at 154 MHz	60 dB
21.4 MHz at 154 MHz	100 dB
Squelch Sensitivity:	
Threshold (FM and AM)	0.5 $\mu$ V
Tight (FM)	25 dB
Tight (AM)	20 dB
Antenna Impedance	50 Ohms
Audio Output Power (10% THD)	1.5 W
Built-in Speaker	77mm, 8-ohm Dynamic Type
Power Requirements:	
	+13.8V DC
Dimensions (HWD)	2 × 6 11/16 × 5 1/2 Inches (50 × 170 × 140 mm)
Weight (without antenna and batteries)	32.5 oz (920 g)

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

BACK COVER PAGE

Warranty & ADDRESS

Date Code

Vender Code: GE-99D-3433

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