

Easier to Read Pro-651/652/106/197 - WS1040/1065 - PSR 500/600 Digital Scanner Manual

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Intro/Review

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WS1040



Pro-651



Pro-106



PSR500



WS1065



Pro-652

This generation of radios, half made by GRE and the newer Pro-651/652 and WS1040/65 are all identical in operation. The PSR-C (Canadian) models are no different from the US models except that the bandplan setting defaults to Canada, the V-Scanner

folders include Canadian provinces, and firmware updates are separate. The newer Pro-651/652 and WS1040/65 don't have preprogrammed V-Scanner folders.

Programming isn't too hard once you figure out how to navigate the new menus. These are another excellent set of radios that have many fine features for scanning, searching, and trunking. However, the manuals that come with the radios are still a mess. The PSR manuals (only on CD but still PDF) aren't too bad but don't include descriptions for the 'Expert Settings'(?). The RS manuals are the worst I've ever seen with an additional 3 page pamphlet vaguely describing the 'Expert Settings' for the radio. Pro-106/197 and PSR500/600 have the V-Scanner Programmed Data in *another* booklet. If you've owned a trunktracker before you pretty much know what to set. The trick is how. You just have to figure out where they all are in the midst of all the new features and *additional* settings.

I decided to write and print this for myself to make it easier to use the radio and am happy to share it with you. This should also make it easier for most people to use some of the more advanced features of the radio (and get their money's worth if you paid full-price for the radio new) as I will try to explain procedures a little more clearly and in a more logical order. Granted, these radios aren't simple so you *will* have to spend some time on them but this manual will make it easier. And, thanks to the many people who have posted their valuable insight on the [Radio Reference forums](#) and Yahoo groups.



Pro-197



PSR600

Pros:
These radios are packed with new features for scanning, searching, and especially for digital trunking. The 'Multi-Site' feature allows you to monitor only the strongest, consecutive, or all control channel frequencies in the system. The audio is great and setting up a digital system is fairly easy right out of the box. 'Object Oriented Memory' also allows you to add service, limit, and stalker/sweeper objects to your scan lists. Squelch 'Search' for conventional objects will search for CTCSS, DCS, and NAC codes. The radios include an 'Expert Settings' menu for fine tuning many other parameters. Multi-site trunking, P25 NAC functionality, 21 V-Scanner Folders, 'multiple' priority channels, hit counters, 'Qtext' can be programmed then used for alpha-tagging, adjustable scan/search delay, the 'Automove' feature arranges LTR freqs in correct LCN order, and the 'Duplication' feature saves programming parameters for similar objects. 'FlexStep' is great for entering channels down to 1.25 kHz steps but the search ranges and limit search are still fixed steps. SAME programming now allows you to enter 'wildcard' location codes and specific event codes that can also be locked out. The display is as bright and big as my Pro-97. There is a configurable LED for visual alerts as well as audible alerts for most objects. The high speed interface is a nice upgrade too.

Cons:
The number buttons on the keypad are very tiny, too close together, and relatively hard to press compared to my older RS/GRE scanners. The clear lens designed over the display on the Pro 106/651 bulges up just begging for scratches. The displays for the base models are the same small display as the hand-holds (even has the low-battery icon when you turn the radio on!). The VHF air service search still has the same 8.33 MHz fixed steps which we still do not use here in the US making it ridiculously slow. You can view the frequency of a conventional channel with the alpha tag but not the ID of a trunked system with the tag unless it's a 'Private' (or 'Radio') ID (?). No status bit control for Motorola IDs.

I think they went overboard on some of the features like possible light intensities for each color of the LED (about 576), and most people won't be programming their IDs in HEX format. There are a lot of settings in these radios the average Joe (or Mary) won't understand and need just to scan or trunktrack their local systems. Luckily, the defaults for most (not all) of the settings work pretty well. The descriptions of some of the settings in the 'Expert Settings' menu are truly vague and, as of this writing, there are limited or no instructions on how change the parameters for improvement. When there is no documentation in the manual for certain features, I have provided links to other resources that have tried to explain how to use and tweak them.

An overview of the features can also be viewed at my [Trunking Radio Comparison Chart](#) page.

If you have a big database of channels to program you will definitely need the [programming software](#) (\$35) and the programming cable (if you bought the Pro 106/651/197/652- another \$35). Qtext is great but still, much easier with the software. With all the features and setting it will save you hours of programming and frustration.

There are better antennas out there to use than the one that comes with the scanner. RS has the [Center-Loaded Telescoping Whip](#) for \$15 - better for VHF/UHF. The [800MHz Scanner Antenna](#) for \$25 - 100% better for 700+ MHz but keep your stock rubber duck/whip handy for areas with a lot of 800MHz overload, especially with digital. You may be able to find others on the web but RS is convenient so you can buy it and take it back in the same day if you don't like it. Read the reviews for each at the site.

For those of you who are new to trunking or haven't had a scanner in the last 10 years it is a good idea to read the respective sections on those topics. You really have to know how trunking works in order to program a trunking system. It won't do you any good to try to program a trunking system unless you know what the radio needs and is going to do with the data (control channel, IDs, LCN order, etc.).

I will assume you know how to obtain the basic information from the original manual such as following safety procedures, putting the batteries in, connecting the antenna, etc. as I will concentrate on the operation and main functions of the scanner.

I hereby absolve myself from anything that happens to anyone or the scanner as a result of the information you will be reading. You are welcome to copy and/or print these pages and use them in the scanning hobby as long as you don't change, redistribute, or charge/accept money for them. I have tried the best I can to make sure everything is accurate here but if I missed a step, you see something that's obviously wrong, or have any other information you would like to contribute to make this manual better for everyone, please [email](#) me.

Check back often as this document will be updated and revised from time to time.

Main Features

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Object Oriented Memory - You can have about 1800 'objects' for each of the 21 V-Scanner Folders (plus the main memory loaded in the scanner). Like Dynamic Memory, you use only the amount of memory you need. Total memory capacity is over 37,800 objects.

Multi-System Trunking - you can track Digital Motorola, Motorola, GE/Ericsson (EDACS), and LTR trunking systems including VHF, UHF, 380, and 700MHz systems.

P25 NAC Functionality - P25 Network Access Code (NAC) is used to provide selective squelch operation on conventional digital channels. The scanner will detect the NAC that is being used on a P25 conventional digital channel, and allow you to program NAC codes to block transmissions that do not have a matching NAC, including analog traffic on the same frequency.

Automatic Adaptive Digital Tracking (ADT) - when monitoring P25 digital systems, instantly adapts the digital decoder to the digital modulation format of the transmitted signal, then analyzes the signal over 50 times each second and adapts to any subtle changes caused by multipath or fading. No cumbersome manual adjustments are required.

Multi-Site Trunking - allows you to scan systems covering a very large geographic area that use multiple antenna sites and operate on different frequencies but use the same Talk Group IDs.

Menu Driven Programming with Context Sensitive Help - each menu item provides a few lines of help text that provide assistance with programming and using the scanner.

V-Scanner Technology - allows you to save complete radio configurations within the radio for recall into main memory as needed. 21 V-Scanner Folders are provided (plus the main memory loaded in the scanner), each capable of storing over 1,800 objects.

Alert LED - programmable LED can be configured to illuminate or flash when certain objects are active. User-defined colors and brightness levels can be specified.

Audible Alarms - programmable audible alerts can be configured to sound when certain objects are active.

Signal Stalker/Spectrum Sweeper - quickly sweeps the scanner's frequency ranges for transmissions from nearby sources.

Simultaneous Trunktrack, Scan, Search, and Stalk/Sweep - scans conventional and trunked frequencies together at the same time along with any search objects (including any Stalker/Sweeper objects) programmed.

Digital AGC - instantly compensates for low user audio levels that are common on digital systems.

22 Scan Lists - 20 lists to program, use, and select like traditional banks allowing you to arrange, group and scan objects according to your preference with an additional 'Favorites' list and a 'Skywarn' list.

High Speed PC Interface - use a USB Scanner programming cable for full duplex mode at 6 times the speed of previous scanner models for PC transfer and 8 times the speed of previous models for radio to radio cloning.

Priority Scan - the scanner will sample conventional objects for activity periodically while scanning and monitoring other objects. The scanner will also give IDs priority over other IDs while checking a particular trunking system for activity.

Object 'Find' - lets you search by lockout status or by text.

Hit Counters - keep track of how many transmissions are received for each object type.

Built-In Discriminator Data Output - in simple ASCII output using the PC/IF port.

CTCSS/DCS/NAC Tone Decode - CTCSS and DCS subaudible squelch coding is processed by the same powerful DSP chip that is used for P25 digital decoding. Provides fast and reliable decoding of subaudible squelch signaling with squelch tail elimination.

Preprogrammed - systems for most major metropolitan areas.

SAME and All Hazards Weather Alerting - can be set to automatically sound the alarm tone to advise of hazardous weather conditions when it detects the alert signal on the local NOAA weather channel (SAME standby mode) or you can scan and set the weather channel as a priority channel.

Control Channel Only Scanning - automatically determines the trunking frequencies for Motorola trunking systems once the control channels are programmed.

LTR Home Repeater AutoMove - enter the LTR system frequencies in any order, and the scanner will automatically move the frequencies to the proper home repeater slots as transmissions are received on the system.

Object Duplication - useful when entering multiple ID objects that are in the same trunked radio system, or multiple conventional objects that have similar parameters or tag names.

FlexStep - allows you to enter a frequency in any 1.25 kHz step.

Backlit Keypad and Display - you select one or the other or both to light (or not), when you press the light button, on any key press (function ignore), or on any key press with that key's function.

Real-time Signal Strength Indicator - shows relative strength of received signals with customizable thresholds.

Temporary/Permanent Lockouts - lets you temporary *or* permanently lockout any *programmed* object and permanently lockout up to 250 search frequencies.

Scan/Search/Trunking Delay - variable delay (0 to 25 seconds) before searching for another object so you can hear more replies that are made on the same object.

Data Cloning - lets you transfer the programmed data from one scanner to another. You can also download the programmed data from a PC to the scanner or upload the programmed data to the scanner (using an optional *two-way* PC cable) with optional software.

16 Character, 4-line, Dot Matrix Text Display - lets you program a text label for each object so you can easily identify the transmission.

7 Service Search Bands - Marine, CB, FRS/GMRS/MURS, Police/Fire, Air, Ham, and Railroad ranges to reduce search setup and monitor interesting frequencies more quickly.

250 Search Lockouts - allow you lockout up to 250 frequencies from the service, limit, and Spectrum Sweeper/Signal Stalker dedicated searches.

Tune Search - The scanner will allow you to start searching up or down from a specific frequency.

Attenuation - lets you program your scanner (per object or globally) to reduce the scanner's sensitivity to strong local signals or noise caused by these signals to reduce interference.

HyperScan and HyperSearch - scans up to 55 channels per second and searches up to 90 steps per second.

Low Battery Alert (HH models) - with customizable battery icon threshold values for NiMH, alkaline, and NiCad batteries.

Three Power Options (HH models) - lets you power the scanner using internal batteries; alkaline, NiCad, or NiMH; external AC power using an optional 9 volt 500-mA AC adapter (and [RS 'type C' adaptaplug](#)); or DC power using an optional 9 volt DC cigarette-lighter power cable adaptor.

Key Lock (HH models) - lets you lock the scanner's keys to help prevent accidental changes to the scanner's programming.

Key Confirmation Tones - the scanner sounds a tone when you press a key, perform an operation correctly, and an error tone if you make an error. Can be turned off.

Memory Backup - keeps the frequencies stored in memory for an extended time if the radio loses power.

Scanning Terminology

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Scanning- the process of **stepping** through *programmed conventional* objects in scan lists.

You can also program a limit, service, and/or Stalker/Sweeper search as an object into a scan list and include the search during scan.

Searching- the process of **searching** for active **frequencies** in pre-programmed service searches, Spectrum Sweeper bands, and the limit search.

Pause Mode- used for monitor single talkgroup objects or frequencies.

Manual Mode- used for browsing objects and monitoring conventional objects. Monitoring active IDs in a trunked system parked on a wildcard ID.

Program Mode- used for programming objects in scan lists, programming/duplicating/finding objects, and accessing the radio settings menus.

Search Mode- the mode the radio is in while performing a dedicated (one at a time) Stalker/Sweeper, service, limit, or tune searches.

Clone Mode- used for cloning scanners and uploading/downloading to/from scanners using a computer.

Understanding Object Orientated Memory

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First we had 'Dynamic Memory' to get used to and now we have 'Object Oriented Memory' to figure out. Memory organization is nothing more than a large collection of scannable objects assigned to various scan lists.

You only have to program any object once, then it can be scanned from any list(s) it is assigned to. A *scannable* 'object' is any Frequency, ID, Stalker/Sweeper Search, Limit Search, or Service Search.

The searches still can be used the same old (dedicated) way and/or be treated as 'objects' (except the 'Tune' search).

Trunking systems and sites are *configuration* objects that are used to scan ID objects. Trunking systems/sites are not assigned to scan lists because you don't scan a trunking system/site; you monitor the IDs it generates.

There are no 'Conventional Systems' for conventional frequencies anymore, just conventional objects assigned to a scan list.

Like Dynamic Memory, you use only the amount of memory you need. Unlike Dynamic Memory, you don't have to 'build' systems or groups first to program them. They are 'created as you go'.

Also, there is no limit (except total memory) to the number of conventional systems, IDs, or conventional channels for each list.

Each *scannable* object can be assigned to one *or more* of the 20 main lists, the '[Favorites List](#)' (#21), or the '[Skywarn List](#)' (#22). Each list is scanned like a traditional bank.

The main lists can be scanned with any other list but when the 'Skywarn' list is selected, only objects in that list will be scanned and no other lists.

The [V-Scanner Folders](#) allow you to save complete radio configurations. 21 V-Scanner Folders are provided (plus the main memory in the scanner), each capable of storing over 1,800 objects.

Total memory capacity of main memory combined with V-Scanners is 39,600 objects.

Object Numbering Objects do have numbers associated with them but are assigned by the scanner in 'blocks'. Motorola systems use 10 blocks each, EDACS and LTR systems 4 blocks, Search/Stalker/Sweeper objects 2 blocks, and Talk Group or conventional objects 1 block. For example if you program a Motorola system first, the object number would be (start at) 0. The next object number would be 10.

The [Win500](#) software will allow you to re-assign the objects in the order you prefer and re-number them too.

Understanding Trunking

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Trunking 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's radio selects a programmed trunking bank in the system when that user presses their PTT (push to talk) button. The trunking system automatically transmits the call on the first available frequency, and also sends (on a different frequency called a Data or Control channel) a code that uniquely identifies that transmission as a talkgroup ID (or just ID.) So when you are trunktracking a system, you are listening to active IDs transmitting in the system (each using the first available frequency in the system.) Trunking systems in general allocate and use fewer frequencies among many different users.

Since the trunking system might send a call and its response on different frequencies, it is difficult to listen to trunked communications using a conventional scanner. These scanners let you monitor the control channel frequency so you can hear calls and responses for users and more easily "follow" conversations than with a conventional scanner.

These trunking scanners trunktrack the following types of systems:

- Motorola Type I
- Motorola Type II
- Motorola Type III Hybrid
- Motorola Type II Smartnet
- Motorola Type II Smartzone
- Motorola Type II Smartzone Omnilink
- Project 25 Standard
- EDACS Standard (Wide)
- EDACS Narrowband (Narrow)
- EDACS Networked (Wide/Narrow)
- EDACS SCAT
- EDACS ESK
- LTR Standard

When you program **Motorola/P25 and EDACS** system frequencies into the scanner, one frequency is the control (or data) channel, and the rest are voice frequencies shared by all the users. There may be 3 or 4 frequencies assigned as (primary or alternate) control channels but only one control channel will be active at a time. These scanners will allow you to program just Motorola/P25 control channels into the trunking system and the voice channels will automatically be found (but not programmed). EDACS systems need all the frequencies for the system programmed *and* in the correct [LCN](#) (Logical Channel Number) order.

The control channel is continually transmitted to the field units and has a sound similar to listening to a boat engine over the phone (in manual mode; you won't hear this when you are trunking the system.) This control channel is also a good check to see if you can trunktrack the system. If you *can't* hear a control channel when you step through the trunking frequencies (in manual mode), you either don't have all the frequencies or are too far away to receive the control channel and the system. Motorola systems are limited to a maximum of 28 frequencies per system or site. Ericsson EDACS systems are limited to 25 frequencies per system or site. Motorola and EDACS systems can be either analog, digital, or mixed (digital and analog talkgroups). Mixed Motorola systems should be programmed as Motorola systems and not P25 digital systems. That way the talkgroup options will allow you to select if it is a digital or analog.

LTR systems work a little differently. LTR systems typically do not have a dedicated control channel. This type of system encodes all trunking information as digital subaudible data that accompanies each transmission. The frequencies also have to be in LCN (Logical Channel Number) order or the correct 'slot' for the system to trunktrack properly. The Auto-Move feature will accomplish this for you. Each repeater has its own controller, and all of these controllers are synchronized together. Even though each controller monitors its own channel, one of the channel controllers is assigned to be a master that all controllers report to. Each of these controllers sends out a data burst approximately every 10 seconds so that the subscriber units know that the system is there. This data burst is not sent at the same time by all the channels, but happens randomly throughout all the system channels. If you listen to the frequencies of an LTR system in manual mode (not trunking), on every channel in the system you will hear this data burst that will sound like a short blip of static like someone keyed up and unkeyed a radio within about 500 msec. LTR systems are limited to 20 frequencies per system.

Trunkscanning is basically scanning IDs that are programmed into ID locations (same concept as frequencies into channels). You can then trunkscan just the programmed IDs. **Trunktracking** is searching for *all* IDs in a system (same concept as searching for frequencies in a band).

Understanding Multi-Site Trunking

Some Motorola and EDACS systems covering a very large geographic area use multiple antenna sites that each operate on different frequencies and use the same talkgroup IDs for traffic. You can program up to 32 frequencies for each trunking system (all you need are the *control channel frequencies*) but if you have more than 32 frequencies for a system (such as large multi-site system), you will have to split it into separate sites (or groups of sites) and duplicate the IDs for each site (or group of sites). Each talkgroup object can be assigned to one or more scan lists but only assigned to one trunking system or site.

Radio Reference.com has an excellent page explaining the various types of trunking systems in more detail [here](#).

Understanding IDs

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ID Formats

Motorola IDs come in two display formats: Type I and Type II. Each format displays and uses Talk Group IDs in slightly different ways. Type I/II hybrid systems use both Type I and Type II formats for Talk Group IDs.

Type I IDs are in the format **BFF-SS** where **B** is the block, **FF** is the fleet, and **SS** is the sub-fleet. Type I systems are usually organized with different IDs assigned to different fleets. For example, a valid fleet/subfleet ID identifying all detectives within a police department might be 000-12, where 000 identifies all police IDs and 12 identifies the Detective division. To properly trunk a Type I system, you have to program the fleet map for the system.

Type II IDs are identified by a 5-digit number. Valid (programmable) Talk Group IDs are divisible by 16.

EDACS IDs come in two display formats: **AFS** (Agency-Fleet-Subfleet) and **Decimal**.

AFS IDs are in the form **AA-FFS** where **AA** is the agency, **FF** is the fleet, and **S** is the sub-fleet. EDACS systems are organized with different IDs assigned to different fleets and agencies. For example, a valid agency/fleet/subfleet ID identifying all detectives within a police department in an agency might be 06-101, where 06 identifies the agency (Police), 10 identifies the Police division (East side), and 1 identifies the Detective division.

Decimal IDs are shown as a decimal number from **0** to **2047**.

You can find a chart showing Decimal and AFS equivalents here: [Conversion Chart](#).

LTR IDs are in the format **A-HH-UUU** where **A** is the area code (0 or 1), **HH** is the home repeater (01-20), and **UUU** is the user ID (000-254).

ID Types

Group Wildcard IDs will monitor *all talkgroup* IDs on the trunked radio system. A wildcard TGRP object allows you to receive IDs that are not already stored as objects in the radio's memory.

Group IDs will only monitor *talkgroup* radio traffic on that specified TGID.

Private Wildcard IDs will monitor *all private* IDs on the trunked radio system.

Private IDs will only monitor *private* radio traffic on that specified private TGID.

Radio IDs are group or private IDs associated with individual radios.

Understanding Receive Modes

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Each *conventional* channel can have its own *receive mode*: **Auto**, **AM**, **FM**, or **NFM**.

Auto - Receives transmissions in the modulation sent.

AM - Receives transmissions in AM modulation.

FM - Receives transmissions in FM modulation.

NFM - Receives transmissions in NFM modulation.

Understanding CTCSS/DCS/NAC

Each *conventional* channel can have its own *scquelch mode*: **None**, **CTCSS**, **DCS**, **P25**, or **Search**.

None no codes will be searched.

CTCSS - PL codes appear (if received) in the format **xxx.x**, where **xxx.x** is a frequency in Hz.

DCS - DPL codes appear (if received) in the format **xxx**, where **xxx** is an octal code.

P25 - NAC codes appear (if received) as a 3-digit hexadecimal number.

Search - the scanner will search and display *any* codes (if received).

Continuous Tone Coded Squelch System (CTCSS), Digital Coded Squelch (DCS), Network Access Code (NAC), are three methods used to prevent interference by other radio communications. Your scanner can receive transmissions that use these codes (or sometimes referred to as tones).

Coded squelch techniques involve the transmission of a special 'code' signal along with the audio of a radio transmission. A receiver with coded squelch only activates when the received signal has the correct 'code'. This lets many users share a single frequency, and decreases interference caused by

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

With few exceptions, such as the VHF Aircraft and Marine bands, almost every other VHF or UHF radio system uses some form of coded squelch. By far, CTCSS is the most popular mode among non-trunked systems. Usually, but not always, VHF channels will use CTCSS and UHF channels will use DCS. P25 (digital) conventional channels will use only NAC. NAC, similar to CTCSS/DCS, has a 3 digit hexadecimal code that can be broadcast along with the digital signal being transmitted.

For more information visit Radio Reference's respective pages on [CTCSS](#), [DCS](#), and [NAC](#).

Turning On The Scanner And Setting the Squelch

Make sure the scanner's antenna is connected before you turn it on.

1. Turn the **VOL** and **SQ** knobs clockwise to about the 9:00 o'clock position.
2. Press **TUNE**
3. Turn **SQ** down (counterclockwise) until you hear noise.
4. Turn **SQ** up (clockwise) a little past where the noise stops. The higher the squelch is set, the stronger the signal required to break the squelch.
5. If noise starts breaking the squelch, turn **SQ** up to decrease the scanner's sensitivity. To hear weaker signals, turn **SQ** down to increase its sensitivity.
6. Press **SCAN** to scan or **PGM** to begin programming.



SQUELCH
Adjust the squelch.

VOLUME/OFF
Turn the scanner on or off;
adjust the volume.

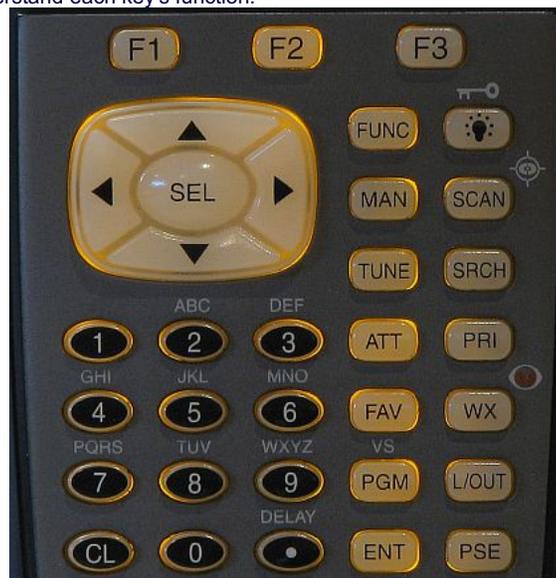
Headphones

A Look at the Keypad

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

Key	Function(s)
F1,F2,F3	Soft keys that select the function in the display directly above each key.
FUNC-F1	Used to access the F1 key during transmissions in search modes (overrides FrL/O for Band and Lmts).
◀ ▶	Used to navigate menus and scan lists.
▼ ▲	Used to navigate menus and objects in scan lists.
SEL (Select)	Enters sub-menus for objects. Selects/de-selects scan lists in object menus; same as ENT (enter). Exits help menu.
FUNC-SEL	Brings up help menu for selected menu item.
FUNC	In text mode toggles capital/small letters; 1st and 2nd set of characters.
☾/☀	(HH) Turns the backlight off/on in normal mode .
FUNC-☾/☀	(HH) Locks/unlocks the keypad.
DIM	(Base) Toggles the display brightness.
MAN	Allows you to navigate to and monitor single objects including search objects. Recalls last tuned object.
SCAN/🔍	Scans the enabled scan lists.
📡	
FUNC-SCAN	Starts dedicated Signal Stalker/Spectrum Sweeper search.
TUNE	Starts a 'Tune' search.
FUNC-TUNE	Starts a 'Tune' search at the current or most recently tuned frequency.
SRCH	Selects dedicated service searches and the dedicated limit search.
(Search)	
ATT	Toggles the attenuator on/off for a specific object in manual or pause modes.
(Attenuator)	Toggles the global attenuator mode on/off in scan and search modes.
FUNC-ATT	Toggles the global attenuator on/off in scan and search modes.
PRI	Toggles priority setting on/off for a specific object or weather channel.
(Priority)	
FUNC-PRI	Toggles priority mode on/off.
FAV	Scans the Favorites (only) scan list.
(Favorites)	
FUNC-FAV	Adds the displayed object to the Favorites scan list.
WX/🌧	Enters weather scan mode.
FUNC-WX/🌧	Scans the Skywarn (only) scan list.
PGM	Enters program mode for editing radio-wide options, adding new objects or editing existing objects.
(Program)	
FUNC-PGM(VS)	Enters V-Scanner mode.
L/OUT	Locks or temporarily locks out an object (depending on the setting of the button).
FUNC-L/OUT	Locks or temporarily locks out an object (depending on the setting of the button).
ENT (Enter)	Enters sub-menus for objects. Saves text and numbers when programming. Selects/de-selects scan lists in object menus; same as SEL (select).



Pro 106/651 Keypad



PSR 600 Keypad

- PSE (Pause)** Pauses scan or search mode.
- 1-0/A-Z** Used to turn scan lists 1-10 on/off. Inputs numbers or characters.
- FUNC- 1-0** Used to turn scan lists 11-20 on/off.
- FUNC-0** toggles Zeromatic Tuning on/off in dedicated search mode.
- CL (Clear)** Clears an incorrect character in text mode.
- FUNC-CL** Clears an entire entry field in text mode or deletes objects.
- .(DELAY)** Inputs decimal point for frequency, space for text, or hyphen for TGID.
- FUNC-.** Toggles delay on/off for an object or for searches.
- (DELAY)**



Function Soft Keys on the base models

A Look at the Display



Scan Mode
Scan List 1
System Name



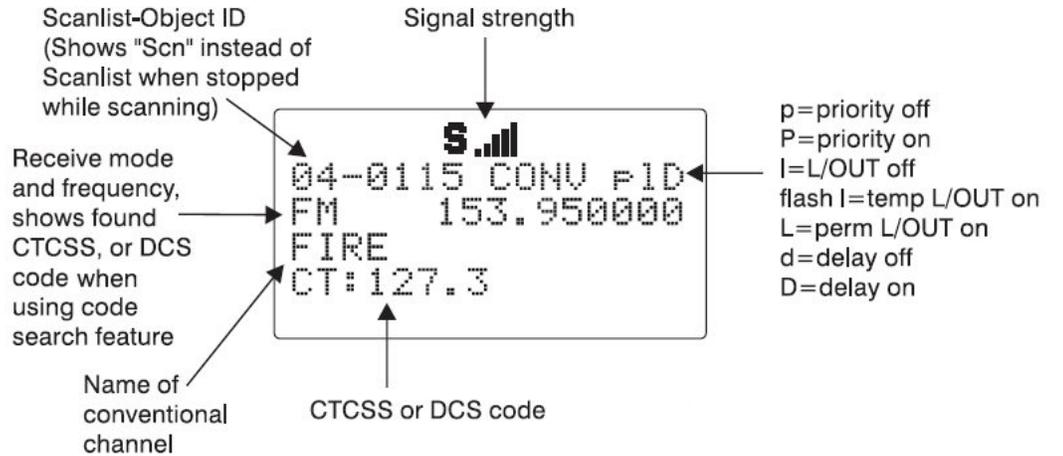
Program Mode Object #582
ID Number, System Name



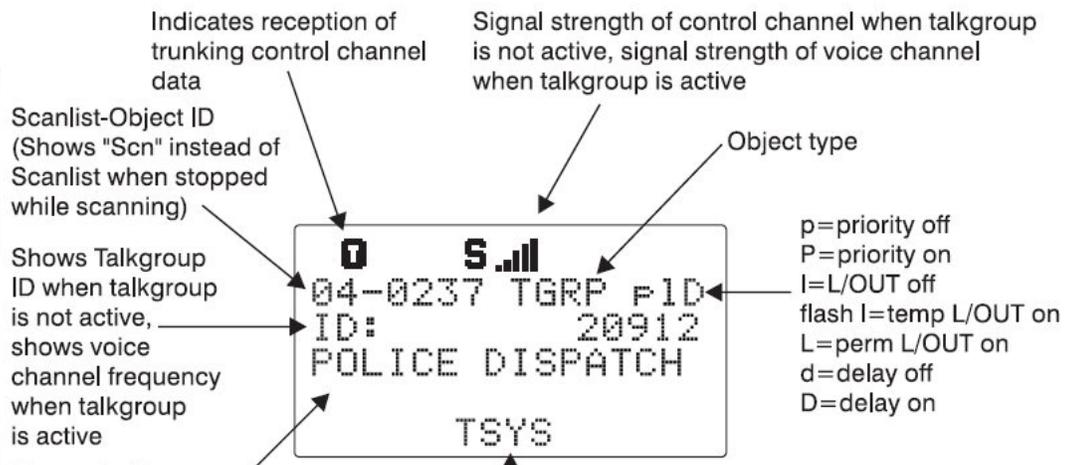
Receiving Object #576
Voice Channel, ID Tag, Radio ID



Receiving Object #571
Control Channel, System Name, Radio ID



Receiving Conventional Channel



Receiving Talkgroup ID

Scan Mode

Top Line

- F** appears when you press **FUNC** to select Function Mode.
- I** appears when the scanner is receiving a trunking control channel frequency.
- G** appears when global attenuation is off for all objects/searches.
- GA** appears when global attenuation is on for all objects/searches.
- S** appears when the squelch circuit is open for a trunking system.
- ||||** appears to show the signal strength of a control channel frequency.
- ☹** (HH only) warning appears solid when the batteries are weak.
- critical warning flashes two times each second when battery failure is soon.
- flashes empty each second when the charging circuit is active.

2nd Line

>>>Scanning<<< appears.

3rd Line

Scan Lists **1-10** that are enabled for scan will appear. A . (dot) indicates the Scan List is disabled. **Blinking numbers** indicate empty Scan Lists.

[Contents](#)

pri appears if priority is off.

PRI appears if priority is on.

Wx# shows the weather channel number in **Weather Scan Mode**. **Wx#-P** indicates weather priority is on

4th Line

Scan Lists 11-20 (1-20) that are enabled for scan will appear. A . (dot) indicates the Scan List is disabled. **Blinking numbers** indicate *empty* enabled Scan Lists.

5th Line

shows the **System Name** when monitoring a trunking system..

shows the **Conventional Channels** being scanned.

shows the **Limit, Service, or Stalker/Sweeper Object Name** being searched.

WX PRI Check appears briefly when weather priority is on.

Scan Receiving Mode

[Contents](#)

Top Line

F appears when you press **FUNC** to select **Function Mode**.

G appears when global attenuation is off for all objects/searches.

GA appears when global attenuation *is on* for all objects/searches.

A appears when attenuation is on for the displayed object.

S appears when the squelch circuit is open.

 appears to show the signal strength of the voice channel in **Manual/Pause Modes**.

 (HH only) warning appears solid when the batteries are weak.

critical warning flashes two times each second when battery failure is soon.

flashes empty each second when the charging circuit is active.

2nd Line

Scn then the 4-digit **object number** appear.

The **Object Type** appears as **TGRP** (Talkgroup), **CONV** (Conventional), **LIMIT** (Limit search), **SWPR/STLK** (Sweeper/Stalker search), **SR-P** (Public Safety service search), **SR-A** (Air service search), **SR-H** (Ham service search), **SR-C** (CB service search), **SR-M** (Marine service search), **SR-F** (FRS/GMRS/MURS service search), or **SR-R** (Railroad service search).

p (not set for priority) or **P** (set for priority) appears to show the **Priority Status** of the **TGRP** or **CONV** object.

z (lowercase) shows **zeromatic off** or **Z** (uppercase) shows **zeromatic on** for a **PubSafety, Aircraft, Ham, or Railroad Service Search SRCH** object.

l (unlocked) or **L** (locked out) or a *blinking l* (temporary locked out) appears to show the **Lock Out Status** of the object.

d (delay off) or **D** (delay on) appears to show the **Delay Status** of the object.

3rd Line

VC and the **Analog Voice Channel Frequency** appear for a **TGRP** object.

DG (uppercase **G**) shows **Digital AGC** is on for the trunked system and the **Digital Voice Channel Frequency** appear for a **TGRP** object.

Dg (lowercase **g**) shows **Digital AGC** is off for the trunked system.

CC## (control channel number in the system frequencies list) and the **Control Channel Frequency** alternates (*if enabled*) for a **Motorola System**.

FM, AM, or NFM appears to show the *received Modulation* then the **Frequency** for a **CONV** object.

FM, AM, or NFM appears to show the *received Modulation* then the **Frequency** and alternates with any **CTCSS/DCS/NAC** tone/code received for a **SRCH** object.

Ch## appears to show the **CB, Marine, or FRS/GMRS/MURS Channel Number** and the **Frequency** alternates with any **CTCSS/DCS/NAC** tone/code received for a **SRCH** object.

4th Line

***ID**: and the **ID Number** (or **ID Name** if tagged) appear for a **TGRP** object.

***PC**: and the **Private ID Number** (or **ID Name** if tagged) appear for a **TGRP** object.

***AC**: and the **ID Number** appear for a **TGRP** object that has been 'auto-created' from a Wildcard hit with the WIN500 software.

ARID: and the **Radio ID** (or **Radio ID Name** if tagged) appear for a **TGRP** object that has been 'auto-created' with the WIN500 software.

The **System Name** will alternate with the **ID number** (or **ID Name** if tagged) for a **TGRP** object.

the **Scan List Name** and **Object Name** alternate for a **CONV** object.

the **Limit, Service, or Stalker/Sweeper Object Name** appears for a **SRCH** object.

5th Line

TGL/O appears above **F1** to lockout a talkgroup received with a **Wildcard ID** in **Receiving/Pause Modes** for a **TGRP** object.

TSYS appears above **F2** to go to **Analyze Mode** for the system in **Receiving/Pause Modes** for a **TGRP** object.

LCN## appears above **F2** to show the **LCN** for an **EDACS System**.

R## appears above **F2** to show the **Home Repeater** for an **LTR System**.

the **Trunking Channel Number** appears above **F2** (*if enabled*) for a **Motorola System**.

Stor (store) appears above **F3** to store the **ID** for a **TGRP** object.

Radioid: and the radio ID appears (*if enabled* and if received) in **Receiving/Pause Modes** for a **TGRP** object.

CT#:,DC#:,P25#: displays any **CTCSS/DCS/NAC tone/code received/programmed** (*if enabled*) for a **CONV** object.

A ζ will appear on the right when the channel is receiving any **CTCSS/DCS/NAC tone/code**. An 'S' will appear before ζ with **squelch mode** set to search to show a 'found' tone/code.

Stor (store) appears above **F3** to store any **CTCSS/DCS/NAC tone/code received** for a **CONV** object.

FrL/O (frequency lockout) appears above **F1** for a **SRCH** object.

Stor (store) appears above **F3** to store the frequency for a **SRCH** object.

Manual/Program/Pause Modes

[Contents](#)

Top Line

F appears when you press **FUNC** to select **Function Mode**.

 appears when the scanner is receiving a trunking control channel frequency in **Manual/Pause Modes**.

G appears when global attenuation is off for all objects/searches.

GA appears when global attenuation *is on* for all objects/searches.

A appears when attenuation is on for the displayed object.

S appears when the squelch circuit is open in **Manual/Pause Modes**.

 appears to show the signal strength of the voice channel in **Manual/Pause Modes**.

 (HH only) warning appears solid when the batteries are weak.

critical warning flashes two times each second when battery failure is soon.

flashes empty each second when the charging circuit is active.

2nd Line

Scn then the 4-digit **object number** alternates with **>PAUSED<** in **Pause Mode**.

the **Scan List Number (01-20)**, **FV** (Favorites), **SW** (Skywarn), or **ns** (no scan list) shows the Scan List the object is assigned to in **Manual Mode** and **PGM** alternates in **Program Mode**.

The **Object Type** appears as **TGRP** (Talkgroup), **CONV** (Conventional), **LIMIT** (Limit search), **SWPR/STLK** (Sweeper/Stalker search), **SR-P** (Public Safety service search), **SR-A** (Air service search), **SR-H** (Ham service search), **SR-C** (CB service search), **SR-M** (Marine service search), **SR-F** (FRS/GMRS/MURS service search), or **SR-R** (Railroad service search).

p (not set for priority) or **P** (set for priority) appears to show the **Priority Status** of the **TGRP** or **CONV** object.

z (lowercase) shows **zeromatic off** or **Z** (uppercase) shows **zeromatic on** for a **PubSafty**, **Aircraft**, **Ham**, or **Railroad Service Search SRCH** object.

l (unlocked) or **L** (locked out) or a *blinking l* (temporary locked out) appears to show the **Lock Out Status** of the object.

d (delay off) or **D** (delay on) appears to show the **Delay Status** of the object.

3rd Line

ID: and the **ID Number** (or **Wildcard**) appear for a **TGRP** object.

PC: and the **Private ID Number** (or **Wildcard**) appear for a **TGRP** object.

au (auto), **FM**, **AM**, or **NFM** appears to show the *programmed Modulation* then the **Frequency** for a **CONV** object.

au (auto), **FM**, **AM**, or **NFM** and the **Frequency** alternates with any **CTCSS/DCS/NAC** tone/code received for a **SRCH** object.

Ch## appears to show the **CB**, **Marine**, or **FRS/GMRS/MURS Channel Number** and the **Frequency** alternates with any **CTCSS/DCS/NAC** tone/code received for a **SRCH** object.

4th Line

***ID:** and the **ID Number** (or **ID Name** if tagged) appear for a **TGRP** object.

***PC:** and the **Private ID Number** (or **Private ID Name** if tagged) appear for a **TGRP** object.

***AC:** and the **ID Number** (or **ID Name** if tagged) appear in for a **TGRP** object that has been 'auto-created' from a Wildcard hit with the WIN500 software.

ARID: and the **Radio ID** (or **Radio ID Name** if tagged) appear in for a **TGRP** object that has been 'auto-created' with the WIN500 software.

The **System Name** will alternate with the **ID number** (or **ID Name** if tagged) for a **TGRP** object.

the **Scan List Name** and **Object Name** alternate for a **CONV** object.

the **Limit**, **Service**, or **Stalker/Sweeper Object Name** appears for a **SRCH** object.

5th Line

RadioID: and the radio ID appears (if enabled and if received) in **Receiving/Pause Modes** for a **TGRP** object.

CT#;DC#;P25#: displays any **CTCSS/DCS/NAC tone/code received/programmed** for a **CONV** object.

A ζ will appear on the right when the channel is receiving any **CTCSS/DCS/NAC tone/code**. An 'S' will appear before ζ with [squelch mode](#) set to search to show a 'found' tone/code.

Stor (store) appears above **F3** to store any **CTCSS/DCS/NAC tone/code received** for a **CONV** object.

FrL/O (frequency lockout) appears above **F1** for a **SRCH** object.

Stor (store) appears above **F3** to store the frequency for a **SRCH** object.

Dedicated Search/Pause Mode

[Contents](#)

Top Line

F appears when you press **FUNC** to select Function Mode.

G appears when global attenuation is off for all objects/searches.

GA appears when global attenuation is on for all objects/searches.

A appears when attenuation is on for the dedicated search.

S appears when the squelch circuit is open.

 appears to show the signal strength.

 (HH only) warning appears solid when the batteries are weak.

critical warning flashes two times each second when battery failure is soon.

flashes empty each second when the charging circuit is active.

2nd Line

Srch Limit, **Railroad**, **PubSafty**, **Aircraft**, **Ham**, **CB**, **Marine**, **F/G/MURS**, appears to show each **Dedicated Search Name**.

Sweeper/Stalker appears to show a Sweeper/Stalker search.

z (lowercase) shows **zeromatic off** or **Z** (uppercase) shows **zeromatic on** for a **Sweeper/Stalker Search** or **PubSafty**, **Aircraft**, **Ham**, or **Railroad Service Search**.

d (lowercase) shows the **delay off** or **D** (uppercase) shows the **delay on** for the search.

3rd Line

au (auto), **FM**, **AM**, or **NFM** appears to show the **Modulation** then the **Frequencies being searched**.

Ch## appears to show the **CB**, **Marine**, or **FRS/GMRS/MURS Channel Number** and the **Frequency** alternates with any **CTCSS/DCS/NAC** tone/code received.

4th Line

Pub Safety and the enable sub-bands (0-4) appear to toggle on or off for a **Public Safety Service** or **Sweeper/Stalker Search**. *Disabled* sub-bands show a . (dot).

All: and the enable sub-bands (0-9) appear to toggle on or off for a **Sweeper/Stalker Search**. *Disabled* sub-bands show a . (dot).

shows the **lower and upper search limits** for a **Limit Search**.

5th Line

Lmts (limits) appears above **F1** to reset the search limits for a **Limit Search**.

Band appears above **F1** to toggle **All Bands** or **Public Safety Bands** for a **Sweeper/Stalker Search**.

Mode appears above **F2** to change the modulation for a **Limit**, **Aircraft**, or **Amateur Service Search**.

spcl (special) appears above **F2** to toggle **Special Sweeper/Stalker** on or off for a **Sweeper/Stalker Search**.

Stor (store) appears above **F3** to store the frequency (to the default Scan List).

Dedicated Search Receiving Mode

[Contents](#)

Top Line

F appears when you press **FUNC** to select Function Mode.

G appears when global attenuation is off for all objects/searches.

GA appears when global attenuation is on for all objects/searches.

A appears when attenuation is on for the displayed or search object.

S appears when the squelch circuit is open.

 appears to show the signal strength.

 (HH only) warning appears solid when the batteries are weak.

critical warning flashes two times each second when battery failure is soon.

flashes each second when the charging circuit is active.

2nd Line

Sweeper/Stalker, **Srch Limit**, **Railroad**, **PubSafty**, **Aircraft**, **Ham**, **CB**, **Marine**, **F/G/MURS**, appears to show each **Dedicated Search Name**.

z (lowercase) shows **zeromatic off** or **Z** (uppercase) shows **zeromatic on** for the search.
d (lowercase) shows the **delay off** or **D** (uppercase) shows the **delay on** for the search.

3rd Line

FM, AM, or **NFM** appears to show the **Modulation** and **Frequency**.
any **CTCSS/DCS/NAC** tone/code received alternates with a **Conventional** frequency.
the **System Type** and **NAC** alternates with a **Motorola P25 Trunked** frequency.

4th Line

The **Dedicated Search Sub-bands Name** and the enable sub-bands **(0-4)(0-6** for amateur) appear to toggle on or off for a **Public Safety, Aircraft,** or **Amateur Service Search**. *Disabled* sub-bands show a . (dot).
shows the **Lower and Upper Search Limits** for a **Limit Search**.

5th Line

FrL/O (frequency lockout) appears above **F1** to lockout a *transmitting* frequency.
Mode appears above **F2** to change the modulation for a **Limit, Aircraft,** or **Ham** search.
all (all channels *not locked out*) or **ALL** (all channels) appears above **F2** to select the channels to scan for a **CB, Marine,** or **FRS/GMRS/MURS** search.
Stor (store) appears above **F3** to store the frequency.

Basic Settings for Navigation

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You may want to change some settings right away to help you program your scanner a little easier. At least it helped me.

Press and hold  until the scanner beeps on the HH models to keep the backlight on.

Press **PGM** to enter program mode.

Press **F3 (GLOB)** to bring you to the **'Radio Settings'** menu.

Press **▼** until the cursor is blinking in front of **LCD BlinkOFF**. For alternating text displays, this sets the display time for the *secondary* display. Enter a value that is comfortable to view. **150** (1.5 seconds) is the default setting. I prefer something around 1 second (**100**).

Press **▼** until the cursor is blinking in front of **LCD BlinkOn**. For alternating text displays, this sets the display time for the *primary* display. Enter a value that is comfortable to view. **50** (.5 seconds) is the default setting. I prefer something around 1 second (**100**).

Press **F1 (Save)** to save the settings and exit the **GLOB** menu.

Navigating the Menus

If you just bought the radio new, right out of the box (or reset it), when you turn it on you will (should) see "**Press NEW to create objects**" in the display, otherwise press **PGM** to enter program mode.

The 3 'soft keys', **F1, F2,** and **F3** activate the function shown in the LCD display above each softkey.

In Program Mode:

NEW (F1) will create a new object.

EDIT (F2) will edit, duplicate, or find an object.

GLOB (F3) will bring you to the **'Radio Settings'** menu.

FUNC then **GLOB (F3)** will bring you to the **'Expert Settings'** menu.

In Manual or Program Mode:

◀ or **▶** will scroll through the scan lists *that have objects in them*. *Empty* Scan Lists will not be displayed. (ex: **01-222** is in scan list 1, object number 222)

▼ or **▲** will scroll through objects in each scan list.

After you have programmed at least 2 *scannable* objects (not trunked systems) , pressing **▼** or **▲** in manual or program mode will select *each object* in the current Scan List.

After you have programmed in at least 2 Scan Lists, pressing **◀** or **▶** in manual or program mode will select *each Scan List*.

The top left of the display will show the **Scan List number** then the **object number**; ex: **01-0010**.

When you enter a menu, press the **▼** or **▲** keys to navigate to the parameter you wish to change.

Pressing and holding the **▼** or **▲** keys will scroll faster.

Pressing **FUNC** then **▲** will bring you to the top of the menu (or any sub menu) and **FUNC** then **▼** will bring you to the bottom.

The active parameter is always the middle parameter and is indicated by a flashing colon.

Pressing **FUNC** then **SEL** will enable the 'help' menu for the selected item. Press **SEL** again to exit the 'help' menu.

Pressing **SEL** or **ENT** activates entry fields.

For most numeric entries (except **Contrast**) simply enter the new value and press **F1 (Done)**.

For most selectable entries (like **Yes, No, On, Off,** etc. and **Contrast**) use the **◀** or **▶** keys to select the new parameter.

For entries with **SEL** after them, press **SEL/ENT** to bring you to another menu to change the parameter.

Pressing **◀, ▶, ▼,** or **▲** will allow you to navigate inside the sub-menus and place the blinking cursor on what you want to edit.

Use the 'soft keys' (**F1, F2,** and **F3**) in the sub menus to **Save, Undo, Exit, Stop, Reset, Del, Canc**l or for **Done, Qtxt, Yes, No, Dflt,** and **OK**.

Main menu changes do not take effect until the menu is saved-**F1 (Save)**. If you forget to save any changes, you will see **'Unsaved Changes! Go Back?'**.

Press **F1 (Yes)** to go back or **F3 (No)** to exit without saving.

If you later find out that you don't like your new setting(s), you can always go back to the parameter, press **F3 (Dflt)**, and restore the default setting. See also [Finding Objects](#).

You can restore *all* 'Global Settings' to their defaults without affecting your programmed objects or V-Scanners. Turn the radio off then back on and press **0** then **2** during the welcome screen. Press **ENT** to confirm the global parameter reset then **ENT** again to reboot.

Text Tagging and Qtxt

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You can program text tags (up to 16 characters) for the welcome screen, any Stalker/Sweeper, limit, or service search, each scan list, conventional channel, trunking system, group ID, private ID or radio ID.

Entering Text Manually:

1. Navigate to the **Tag:** option (or **Owner:** for the welcome screen) in the menu of the object you wish to tag and press **SEL/ENT**.

2. Press **FUNC** then **CL** to clear the existing tag if desired.
3. Move the cursor to the position where you want to insert the text.
4. Select each letter by pressing the corresponding number key below each letter (**2** for **A,B**, or **C**). The display will then show the available letters.
5. Select **1** for the first letter, **2** for the second letter, **3** for the third letter, or **4** for the fourth letter.

To toggle between capital and small letters, at any time, press **FUNC**.

To insert a number, press **1** first, then enter the desired number.

To insert a special character, press **0** first, (then **FUNC** if you want to see the *second* set of characters) then the number of the desired character.

To insert a space, press . (period).

If you want to clear the existing character, place the cursor *to the right* of the character (??) and press **CL**.

If you want to clear the whole text field press **FUNC** then **CL**.

If you want to move the cursor to the beginning of the text field, press **FUNC** then ◀.

If you want to move the cursor to the end of the text field, press **FUNC** then ▶.

6. Press **F1 (Done)** to save the tag and exit.

a,A	21	x,X	92
b,B	22	y,Y	93
c,C	23	z,Z	94
d,D	31	1	11
e,E	32	2	12
f,F	33	3	13
g,G	41	4	14
h,H	42	5	15
i,I	43	6	16
j,J	51	7	17
k,K	52	8	18
l,L	53	9	19
m,M	61	0	10
n,N	62	\$. ,	01
o,O	63	% , -	02
p,P	71	! , #	03
q,Q	72	^ , _	04
r,R	73	(, @	05
s,S	74) , +	06
t,T	81	? , *	07
u,U	82	-> , &	08
v,V	53	' , /	09
w,W	91	< , ,	00

QuickText allows you to store up to 10 of your commonly used entries to select when tagging object.

Customizing Qtxt:

1. Press **PGM** then **GLOB** to enter the 'Radio Settings' menu.

2. Press ▼ to scroll to **Qtxt1** and press **SEL/ENT**.

3. [Enter the text](#) you wish to assign to **Qtxt1**.

Note: When you use the Qtxt entry in a text field, any unused spaces will be filled with space characters. If you want to leave room for adding more text after the Qtxt entry, enter a space and a dollar sign (\$) (or just a dollar sign [\$]). When you use the Qtxt in a text field, the edit cursor will be placed where the dollar sign is positioned so you can continue adding text.

4. Press **F1 (Done)** to save the Qtxt and exit.

5. Press ▼ to scroll to the next **Qtxt** entry and repeat for each of the 9 remaining entries.

6. Press **F1 (Save)** to save the settings and exit the **GLOB** menu.

You can, at anytime, press **F2 (Undo)** to exit. You will see 'Unsaved Changes! Go Back?'

Press **F1 (Yes)** to go back or **F3 (No)** to exit, cancel any changes, and return to the 'Radio Settings' menu.

You can, at anytime, press **F3 (Qtxt)** to use *existing* Qtxt for any *new* Qtxt by selecting the number assigned to any existing Qtxt.

You can also press **F3** multiple times to add more than one Qtxt. For example, if you want to change Qtxt1 (**Fire \$**) to 'Police Sheriff \$', press **F3 (Qtxt)**, and **2** to select 'Police \$', then **F3 (Qtxt)**, and **3** to select 'Sheriff \$'.

Using Qtxt:

1. Navigate to the **Tag:** option (or **Owner:** to change the welcome screen) in the menu of the object you wish to tag and press **SEL/ENT**.

2. Press **FUNC** then **CL** to clear the existing tag if desired. Move the cursor to the position where you want to insert the text.

3. Press **F3 (Qtxt)** then ▼ to scroll to the Qtxt item (**1-10**) you want to insert and press **ENT**. Or, press the number key (**1-10**) corresponding to the Qtxt you want to insert and press **ENT**.

You may then continue [adding text](#) or another Qtxt entry (press **F3 [Qtxt]** again).

4. Press **F1 (Done)** to save the tag and exit.

You can, at anytime, press **F2 (Undo)** to exit. You will see 'Unsaved Changes! Go Back?'. Press **F1 (Yes)** to go back or **F3 (No)** to exit, cancel any changes, and return to the previous menu.

Global Settings Menu

The GLOB ('Radio Settings') menu allows you to change the radio-wide settings used by the scanner. The default settings will work fine for most users but you will probably want to personalize the radio to suit your individual needs.

Press **PGM** then **F3 (GLOB)**. Use ▼ or ▲ to select each option.

Main menu changes do not take effect until the menu is saved-**F1 (Save)**.

If you forget to save any changes, you will see 'Unsaved Changes! Go Back?'

Press **F1 (Yes)** to go back or **F3 (No)** to exit without saving.

[Contrast](#)

[Dim LED \(Base only\)](#)

[Priority](#)

[Key Repeat](#)

[Search Delay](#)

[Owner](#)

[Battery \(HH only\)](#)

[WxPri](#)

[LCD BlinkOff](#)

[SRCH Dig AGC](#)

[Clone Send](#)

[Lo Batt Alert \(HH only\)](#)

[Scan Lists](#)

[LCD BlinkOn](#)

[SRCH SuprTrk](#)

[Alert Mode](#)

[Battery Info \(HH only\)](#)

[SRCH L/Outs](#)

[LED BlinkOff](#)

[TLO=FUNC L/O](#)

[Sound Mode](#)

[Charge Time \(HH only\)](#)

[Clear FAV](#)

[LED BlinkOn](#)

[DupChecksSQ](#)

[Key Beeps](#)

[AttenMode](#)

[Memory Info](#)

[Pri Channels](#)

[TGID Format](#)

[Light Mode](#)

[Global Atten](#)

[Tune LED](#)

[Pri Interval](#)

[TGRP Ignore](#)

[Light Area \(HH only\)](#)

[Clear Hits](#)

[Color 0-7](#)

[TGRP Pri Int](#)

[ShowCCInfo](#)

[Light Secs \(HH only\)](#)

[Hit Counts](#)

[Qtxt 1-10](#)

[QuickPriRtn](#)

[Set password](#)

[Light Level \(Base only\)](#)

[Dflt ScanList](#)

Contrast Press ◀ or ▶ to select the best contrast.

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Owner Allows you to edit the welcome screen seen when you turn on the radio.
Press **SEL/ENT** to edit.
You are allowed 4 lines of (16 character) text. Press ▼ or ▲ to select each line.
[Enter text](#) or [Qtext](#) for the selected line.
Press ▼ or ▲ to select another line and enter more text or Qtext.
Press **F1 (Done)** to save and exit.

Clone Send You can transfer data to and from any Pro 106/197/651/652/PSR 500/600 using a cable which has a 1/8-inch *stereo* phone plug on both ends. Both working memory and 'Global Settings' are transferred.
Turn on both radios.
Connect the cable to each scanner's PC/IF jack.
On the sending radio press **PGM** then **GLOB**.
Scroll to '**Clone Send:**' and press **SEL/ENT** when you are ready to send to the target radio.
Press **F1 (Done)** on the sending radio to exit.
The target radio should reboot when finished.

Alert Mode Controls the alert LED and audible alarm behavior. Default is **Both**.
Press ◀ or ▶ to select:
Off - no alerts.
Both - uses the Alert LED and Tone.
Tone - uses the audible alarm only.
Light - uses the Alert LED only.

Sound Mode When set to '**On**', allows all radio beeps including [Key Beeps](#). Must be '**On**' for [Alert Mode](#). Default is **On**.
Press ◀ or ▶ to select **On**, or **Stlth** (stealth=off).

Key Beeps Press ◀ or ▶ to select **On**, or **Off**. Default is **On**.

Light Mode Controls how the backlight operates. Default is **Norml**.
Press ◀ or ▶ to select **On**, **Stlth** (stealth=off), **Norml**, **Key**, or **Ignre**.
On(HH only) - backlight is on when you turn on the radio and stays on.
Stlth - disables backlight.
Norml - uses the backlight button on the keypad. Press to turn on for the amount of time set in [Light Secs](#).
Key(HH only) - backlight turns on when *any* key is pressed for the amount of time set in [Light Secs](#).
Ignre(HH only) - backlight turns on when *any* key is pressed for the amount of time set in [Light Secs](#) and the key's normal function is ignored for the first press.
Pressing any key again (when the light is on) will activate its function.
Note: (HH only) You can still *press and hold* the backlight button until you hear the beep in any mode (except **Stlth**) to keep it on and then press it to turn it off.
When you power off the radio it will revert to its set mode in the **Light Mode** menu.

Light Area (HH only) Controls what is lighted. Default is **Both**.
Press ◀ or ▶ to select **Both**, **LCD**, or **Keybd**.
Both - lights the display and keyboard.
LCD - lights the display only.
Keybd - lights the keyboard only.

Light Secs (HH only) Controls how long the backlight stays on. Default is **5**.
Enter the amount of time, **1-99** seconds, the backlight will stay when [Light Mode](#) is set to **Norml**, **Key**, or **Ignre**.

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Light Level (Base only) Controls backlight intensity. When [Dim LED](#) is set to **Yes**, it also controls the Alert LED intensity. Accessed from the front panel using the **DIM** key. Default is **Brit**.
Press ◀ or ▶ to select:
Brit - lights the display bright.
Dim - lights the display dim.
Off - display light is off.

Dim LED (Base only) When set to **Yes**, **DIM** key and [Light Level](#) setting also control intensity of alert LED. Default is **Yes**.
Press ◀ or ▶ to select **Yes** or **No**.

Battery (HH only) Allows you to select which type of batteries you are using. Default is **Alkaline**.
Press ◀ or ▶ to select **NiMH**, **Alkaline**, or **NiCad**.
Note: You must use the yellow battery holder to charge NiMH and NiCad batteries. (External charger is *strongly* recommended). **Do not use the yellow battery holder with alkaline batteries!**

Lo Batt Alert (HH only) Controls the *critical* battery audible alert. Default is **30**.
Enter the amount of time, (**0=off**) - **60** seconds between alert beeps.

Battery Info (HH only) Allows you to view the charging status, battery voltage, and DAC value.
Press **SEL/ENT** to view.
When the scanner is plugged in *and* charging, will show '**Charge: (and time left)**' if charging.
To reset the timer press **F3 (Reset)**.
To stop charging press **F2 (Stop)**. Will show '**Charger is off**'. To restart press **F3 (charge)**.
Press **F1 (Done)** to exit.

Charge Time (HH only) Allows you to set the battery charge time in hours. **0** = off. The battery charger charges at a current rate of 150 mA. The charger is disabled when [Battery](#) option is set to **Alkaline**. The default charge time (**99**) will charge 9 hours for Ni-Cd batteries and 16 hours for Ni-MH batteries.

Warning: The scanner will charge continuously with the scanner turned **off** and plugged into external power. (External smart charger is *strongly* recommended).

Enter the number of hours, **0 - 16** the charger will charge.

AttenMode Sets the global attenuator *mode*. **Global** applies attenuation (on or off) to all objects. **Normal** uses object attenuation settings. 'G' will appear in the *middle* of the display when set to **Global**. See chart below. Default is **Global**. See also [System Attenuation](#) and (conventional) [Object Attenuation](#).

Press ◀ or ▶ to select **Normal** or **Global**.

Normal - the attenuator follows the individual object attenuator setting.

Global - applies attenuation radio-wide regardless of object settings *only* when [Global Atten](#) is set to **On**. 'G' will appear in the display when scanning or searching.

Note: You can also toggle this setting by pressing **FUNC** then **ATT** in Scan or Search mode.

Global Atten Sets global attenuation (on or off) to every object regardless of the object attenuation setting. Indicators will appear in the *middle* of the display to indicate attenuation status. Default is **Off**. See chart below.

Press ◀ or ▶ to select **On** or **Off**.

Note: You can also toggle this setting by pressing **ATT** in Scan or Search mode.

Attenuation Settings

<u>Object Attenuation</u>	<u>AttenMode</u>	<u>Global Atten</u>	<u>Display</u>	<u>Results</u>
Off	Normal	Off	No G or A	Object/system/search attenuation Off
On	Normal	Off	A	Object/system/search attenuation On
On or Off	Global	Off	G	Attenuation Off- all objects/systems/searches
On or Off	Global	On	GA	Attenuation On- all objects/systems/searches

Clear Hits Clears *all* the hit counters for *all* objects if **Hit Counts** (see next entry) has previously been set to **On**. You can clear *each* object's hit count by going to each object's menu.

Press **SEL/ENT**. 'Really clear all object hit count data?' will appear. Press **F1 (Yes)** to clear or **F3 (No)** to exit.

Hit Counts When set to '**On**', keeps track of how many transmissions are received (or not received) for each object. Default is **No**.

Press ◀ or ▶ to select **Yes** or **No**.

Dflt ScanList Sets the default Scan List destination for programming new objects and the **Stor (F3)** location for conventional objects found with Stalker/Sweeper, Limit, Service, and Tune searches. Use **1-20** for the normal Scan Lists. Use **21** for the Favorite List. Use **22** for the Skywarn List. Use **0** (no scan list) if you want to (will have to) select a different Scan List each time. Default is Scan List 1.

Enter **0 - 22** and press **ENT**.

Note: Any object assigned to **0** (no scan list) will not be scanned. You can't select this list to scan.

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Priority Turns priority scan on or off. The display will show '**PRI**' (uppercase) when priority is on and '**pri**' (lowercase) when priority is off. Default is **Off**.

Press ◀ or ▶ to select **On** or **Off**. See also [Priority Scanning](#).

Notes: You can also do this by pressing **FUNC** then **PRI** in scan mode. You can enable priority scan even with no objects set for priority.(?)

WxPriority Allows you to check the specified weather frequency periodically while scanning to see if the All Hazards 1050 Hz Warning Alert Tone (WAT) is present. If the WAT is present, the scanner will sound an alarm and tune to the programmed weather frequency to monitor the nature of the alert. **WX PRI Check** appears briefly on the bottom line of the display in scan mode. Default is **Off**.

See also [Weather Settings](#) (in the '**Expert Settings**' menu).

Press ◀ or ▶ to select **Off** or one of the **preprogrammed weather channels**.

Notes: You can also do this by pressing **WX** then **PRI** in Scan mode. Does not work in Search or Stalker/Sweeper Modes.

Scan Lists Allows you to enable (turn on) and disable (turn off) the (normal; **1-20**) Scan Lists to scan.

Press **SEL/ENT** to edit.

Press ▼ or ▲ to select the Scan List and press **SEL/ENT** to enable or disable the list. An asterisk (*) appears next to all enabled scan lists.

Note: You can also do this by pressing the **number keys** on the keypad for single digit scan lists or **FUNC** then the **number keys** for double-digit scan lists (**FUNC** then **1** for 11) in Scan mode.

SRCH L/Outs Allows you to enter a sub menu for reviewing, editing or deleting *search* lockout frequencies.

Press **SEL/ENT** to edit. Press ▼ or ▲ to select the locked out frequency.

To unlock the frequency press **F3 (Del)**.

To add a frequency press ▼ or ▲ to select an empty slot and enter the frequency.

Press **F1 (Save)** to save and exit.

Clear FAV Clears the 'Favorites' Scan List.

Press **SEL/ENT**. 'Really remove all objects from FAV scan list?' will appear. Press **F1 (Yes)** to clear or **F3 (No)** to exit.

Memory Info This will show you total number of objects, free space percentage, number of conventional channels, talkgroups, trunked systems, and search objects.

Press **SEL/ENT**. Press **F1 (Done)** to exit.

Tune LED When set to '**On**', activates the signal strength driven LED when in 'Tune' mode. The color of the LED will change as the signal increases (from 'color 0' to 'color 7'?). Default is **Off**.

Press ◀ or ▶ to select **On** or **Off**.

Color 0-7 Here is where you customize the colors used to illuminate or flash the LED when certain objects are active. They set the intensity of red, green, and blue for each of the 8 selectable colors. By default, **Color 0=Off**, **Color 1=Red**, **Color 2=Yellow**, **Color 3=Green**, **Color 4=Cyan**, **Color 5=Blue**, **Color 6=Magenta**, and **Color 7=White**.

For each color, (**0-7**), press **SEL/ENT** to edit.

Press ◀ or ▶ to select **R** (red), **G** (green), or **B** (blue).

Use the number keys (**0-9**) to set preset intensities or press ▼ or ▲ to select your own custom intensity.

Press ◀ or ▶ to select the next color and repeat.

Press **F1 (Done)** to save and exit.

Qtxt 0-9 See [Customizing Qtxt](#).

Key Repeat When set to 'On', allows you to *press and hold* keys like ▼ or ▲ to navigate through the menu faster. Default is **On**.
Press ◀ or ▶ to select **On** or **Off**.

LCD BlinkOff For alternating text displays, sets the display time for the *secondary* display element. (**object number, channel name, ID name/number, search name, scan list number**)
Enter the amount of time, **1 - 250** (10 - 2500 ms). Enter **1** for 'off'. Default is **150** (1.5 secs).

LCD BlinkOn For alternating text displays, sets the display time for the *primary* display element. (**system name, scan status, scan list name, program mode, >PAUSED<**)
Enter the amount of time, **1 - 250** (10 - 2500 ms). Enter **1** for 'off'. Default is **50** (.5 secs).

LED BlinkOff When the Alert LED setting for an object is set to 'Flash', this is the amount of time the LED stays turned *off*.
Enter the amount of time, **1 - 250** (10 - 2500 ms). Enter **1** for 'off'. Default is **50** (.5 secs).
Note: [Alert Mode](#) must be set to **Both** or **Light** for the LED to function.

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LED BlinkOn When the Alert LED setting for an object is set to 'Flash', this is the amount of time the LED stays turned *on*.
Enter the amount of time, **1 - 250** (10 - 2500 ms). Enter **1** for 'off'. Default is **5** (50 msecs).
Note: [Alert Mode](#) must be set to **Both** or **Light** for the LED to function.

Pri Channels Sets the number of *conventional* priority channels to check during a priority scan. **0** checks *all* conventional priority channels. Default is **0**.
See also [Priority Scanning](#).
Enter the number of priority channels, **0 - 250**, the scanner will check.

Pri Interval Sets how often the scanner checks *conventional* priority channels. See also [Priority Scanning](#).
Enter the amount of time, **2 - 100** (.2 - 10 seconds), the scanner will do a priority check. Default is **20** (2 secs).

TGRP Pri Int When set to 'On', the scanner interrupts trunked activity to check for conventional priority channels according to the [Pri Interval](#) setting when priority is turned on. Default is **On**.
See also [Priority Scanning](#).
Press ◀ or ▶ to select **On** or **Off**.

QuickPriRtn When set to 'On', does not wait for verification of correct CTCSS, DCS or NAC when returning to an active conventional channel after priority sampling. Default is **Off**.
Press ◀ or ▶ to select **On** or **Off**.

Search Delay Sets the delay for all dedicated (Tune, Stalker/Sweeper, Service, Limit) search modes.
Enter the amount of time, **1 - 250** (.1 - 25 seconds), for the delay. Default is **20** (2 secs).

SRCH Dig AGC When set to 'On', sets AGC for digital audio in all search modes. Useful to compensate for low or high digital audio levels on the system. Default is **On**.
Press ◀ or ▶ to select **On** or **Off**.

SRCH SuprTrk Alternative [DSP](#) decoding algorithm is applied to all search types. When set to 'On', may help reception on some systems. Default is **On**.
Press ◀ or ▶ to select **On** or **Off**.

TLO=FUNC L/O Controls the operation of the **L/OUT** key. *Temporary* lockouts reset when the scanner is turned off.
When set to 'No', pressing **L/OUT** performs a *Temporary* lockout of the object and pressing **FUNC** then **L/OUT** performs a *Permanent* lockout. (solid uppercase L in display)
When set to 'Yes', pressing **L/OUT** performs a *Permanent* lockout of the object and pressing **FUNC** then **L/OUT** performs a *Temporary* lockout. (blinking lowercase l in display)
Default is **No**.
Press ◀ or ▶ to select **Yes** or **No**.

DupeCheckSQ If set to 'Yes', the scanner will check the stored frequency *and* any squelch settings when checking for duplicate conventional objects. Default is **Yes**.
Press ◀ or ▶ to select **Yes** or **No**.

TGID Format Sets Talk Group ID format display. Default is **Norm**. See also [Understanding IDs](#).
Press ◀ or ▶ to select:
Norm - for EDACS AFS format, Motorola, and LTR systems.
Dec - for EDACS Decimal format, Motorola, and LTR systems.
Hex - for EDACS and Motorola - shows IDs in Hexadecimal format.

TGRP Ignore If set to 'Yes', TGRP wildcards will not receive IDs (in the same system) that are assigned to disabled Scan Lists. If set to 'No', TGRP wildcards will receive IDs mapped to all disabled Scan Lists containing IDs for that system. Default is **Yes**.
Press ◀ or ▶ to select **Yes** or **No**.

ShowCCInfo If set to 'Yes', shows current control channel frequency alternating with the voice frequency for Motorola and P25 systems. Default is **No**.
Press ◀ or ▶ to select **Yes** or **No**.

Set password Sets power-on password. (default **0000** is no password).
Press **SEL/ENT**.
To set new password then press **F1 (Yes)**.
[Enter text \(or numbers\)](#) for new password and press **F1 (OK)**.

Planning Systems and Scan Lists

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Scan Lists

Each *scannable* object (not trunking systems) can be assigned to one *or more* of the 20 main lists, the '[Favorites List](#)' (#21), or the '[Skywarn List](#)' (#22). Each list is scanned like a traditional bank. You can put any type of scannable object in any list with any other type of scannable object. Conventional,

Search, and Talk Group objects can all go in the same list. The main lists, 1-20, can be scanned with any other list but the 'Favorites List' and the 'Skywarn List' will only scan objects in each respective list and no other lists. The only disadvantage here is there are only 22 lists to put everything in. But, you can put as many objects in each of these 22 locations that memory allows.

The scanner is designed to be programmed by 'Scan List'. Once you set the [Default Scan List](#), (in the **GLOB** menu) you can simply start programming your objects. When you create an object, it is by default, assigned to the default Scan List.

Object Order

If you don't have the software (yet) you should program your objects in some kind of order you can remember in case you want to find them. Every object you program (by hand) is assigned an object number by the *scanner*, not you. See [Object Numbering](#) for more detail on how that happens. You may want to put your trunking systems in first. Remember, you can also program searches and Sweeper/Stalker searches as objects too.

Multi-Site Systems

Some Motorola and EDACS systems covering a very large geographic area use multiple antenna sites that each operate on different frequencies and use the same talkgroup IDs for traffic. You can program up to 32 frequencies for each trunking system (all you need are the *control channel frequencies*) but if you have more than 32 frequencies for a system (such as large multi-site system), you will have to split it into separate sites (or groups of sites) and duplicate the IDs for each site (or group of sites). Each talkgroup object can be assigned to one or more scan lists but only assigned to one trunking system or site. That's when the software comes in handy. This method fixes the 32 control channel limit per system but also defeats the [Multi-site](#) 'Roaming' functionality. Each TGRP object can be assigned to multiple Scan Lists but only to one trunking system. But, you are really only able to monitor sites within about a 30 mile radius and that usually wouldn't be more than 15-20 sites or 32 control channels anyway. Splitting your big system up will also allow you to tag the smaller groups (or sites) as the scanner only displays tags for systems and not sites.

Using Menu Help

For each menu item there is a few lines of help text to explain the setting or options accessible by pressing **FUNC** then **SEL** when the item is highlighted (has the blinking : [colon] after it). To exit the help menu press **SEL** again.

Creating (Programming) Objects

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Programming Object Orientated Memory is relatively easy and straight forward compared to Dynamic memory. The only real confusing twist is that you have to go into the 'Talkgroup' menu to get to the 'Trunked System' menu to create a trunking system. I believe that is so you won't forget to program at least a 'Wildcard' ID which allows you to monitor all talkgroups.

To Create a New Conventional Object press **PGM** then **F1 (NEW)** then **F2 (CONV)**.

A new conventional object is created in the [Default Scan List](#) and you are taken to the **CONV Channel Menu**. See the [CONV Channel Menu](#) to edit the conventional channel.

To Create a New Trunked System Object press **PGM** then **F1 (NEW)** then **F1 (TGRP)**.

You are now in the **Talkgroup Menu**.

A new [Group 'Wildcard' ID](#) is created in the [Default Scan List](#) that will receive all (not private) talkgroups.

Press **▼** until **TSYS:** is selected.

Press **◀** or **▶** to select **NEW** then press **SEL/ENT**.

You are now in the **Trunked System Menu**.

See the [Trunked System Menu](#) options.

To Create a New Talkgroup Object press **PGM** then **F1 (NEW)** then **F1 (TGRP)**.

A new [Group 'Wildcard' ID](#) is created in the [Default Scan List](#) that will receive all (not private) talkgroups.

See the [Talkgroup Menu](#) options.

To Create a New Limit Search Object press **PGM** then **F1 (NEW)** then **F3 (SRCH)** then **F1 (LMIT)**.

To Create a New Service Search Object press **PGM** then **F1 (NEW)** then **F3 (SRCH)** then **F2 (SRVC)**.

To Create a New Stalker/Sweeper Search Object press **PGM** then **F1 (NEW)** then **F3 (SRCH)** then **F3 (STLK/SWPR)**.

A new search object is created in the [Default Scan List](#). See the [Search/Stalker/Sweeper Object Menu](#) options.

There is a ['Duplication'](#) feature that allows you make a copy of an object and all of its parameters and tweak any parameters for the new object.

Good for agencies that have multiple frequencies with the same name, tone code, alert settings, etc. See also [Finding Objects](#) to change anything after programming.

To Use a regular Stalker/Sweeper, Limit, or Service Search go to [Dedicated Searches](#).

CONV (Conventional) Channel Menu

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The CONV menu is used when *editing* Conventional objects. To *create* a Conventional object see [Creating Objects](#).

To Edit an existing conventional object press **PGM** then press **F2 (EDIT)**.

Press **▶** until **CONV** is over **F3** then press **F3**.

Press **◀** or **▶** to select the Scan List where the object is located. Press **▼** or **▲** to locate the object in the list.

Press **F2 (EDIT)** then **F2 (CURR)**. See also [Finding Objects](#).

Use ▼ or ▲ to select each option below.

Menu changes do not take effect until the menu is saved-F1 (Save).

If you forget to save any changes, you will see **'Unsaved Changes! Go Back?'**.

Press **F1 (Yes)** to go back or **F3 (No)** to exit without saving.

[Scan Lists](#)

[Freq](#)

[Tag](#)

[Sq Mode](#)

[CTCSS Hz](#)

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[SuperTrack](#)

[AudioBoost](#)

[Hit Count](#)

Scan Lists: This is where you select which Scan List(s) you want the object to be in for scanning.
Press ◀ or ▶ to select the list (01-22) then press **SEL/ENT** to select any/every list you want the conventional object to be in. A * (asterisk) will appear in front of each list the object will be assigned to.
Note: The * will *always* be in front of the [Default Scan List](#). If you want to select a different list, don't forget to deselect the default Scan List.

Freq: Enter the frequency and press **SEL/ENT**. See also [BandPlan](#) and [FlexStep](#) settings (in the 'Expert Settings' menu) for step size defaults.

Tag: Press **SEL/ENT** to change the default object name-'Channel' to something different.
See [Enter Text](#) or [Enter Qtext](#).

Sq Mode: Press ◀ or ▶ to select the squelch mode for the object. Default is **Search**.
Search - automatically analyzes signals to determine squelch mode and code to display *if* received.
None - ignores all squelch codes.
CTCSS - to receive and display tone squelch *if* received. See also [CTCSS Hz](#).
DCS - to receive and display digital coded squelch *if* received. See also [DCS Code](#).
P25 - to receive and display Project 25 conventional digital squelch (NAC-Network Access Code) *if* received. See also [P25 NAC](#).

The minimum unmute delay for analog conventional channels is when **Sq Mode** is set to CTCSS or DCS and **CTCSS Hz** or **DCS Code** is set to Search:
Sq Mode = None or Search: scanner first tries for digital (default time 600ms), then decides it's analog and unmutes audio. See [DG Int Prime](#).
Sq Mode = CTCSS or DCS, *with* a tone/code programmed: scanner presumes it's analog (doesn't try for digital), but must decode the programmed tone/code before unmuting audio.
Sq Mode = CTCSS or DCS, *with no* tone/code programmed ('search'): scanner presumes it's analog (doesn't try for digital), unmutes audio immediately, then displays any decoded tone/code. [10]

CTCSS Hz: Allows you to program a specific tone when [SQ Mode](#) is set to **CTCSS**. Press ◀ or ▶ to select the **tone** or **Search** for any tone.

DCS Code: Allows you to program a specific digital code when [SQ Mode](#) is set to **DCS**. Press ◀ or ▶ to select the **digital code** or **Search** for any code.

P25 NAC: Allows you to program a specific NAC code when [SQ Mode](#) is set to **P25**. Press ◀ or ▶ to *enter* the **NAC code** or press **F3 (Dfif)** to select 'NAC Search'.
See [Entering text](#) to enter the (decimal) number code or Hex code.

L/Out: Sets the lockout status of the object. Default is **Off**.
Press ◀ or ▶ to select **On** or **Off**.

Priority: When set to 'On', the object will be included in priority scan when [Priority](#) (in the **GLOB** menu) is *also* set to **On**. Default is **Off**. See also [Priority Scanning](#).
Press ◀ or ▶ to select **On** or **Off**.
Note: You can also do this by pressing **PRI** when the object is in the display in manual, program, or scan modes.

LED Mode: Controls whether the Alert LED flashes or remains on solid at the beginning of each transmission or anytime the scanner stops on the object while scanning. Default is **Solid**.
Press ◀ or ▶ to select **Flash** or **Solid**.
Notes: [Alert Mode](#) (in the **GLOB** menu) must be set to **Light** or **Both** for the LED to function.
(Base only) [Dim LED](#) (in the **GLOB** menu) must be set to **No** *if* [Light Level](#) (in the **GLOB** menu) is set to **Off** for the LED to function.

LED Color: Sets the LED color for the object ([as defined](#) in the **GLOB** menu). Default is **0**.
Press ◀ or ▶ to select the color **0-7**.

Latch LED: When set to 'On', the Alert LED will remain in the [LED Mode](#) after the transmission is complete or until it is overridden by the next object that is also using an Alert LED. Default is **Off**.
Press ◀ or ▶ to select **On** or **Off**.

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Backlight: Sets how the backlight will function while the object is active. Default is **Off**.
Press ◀ or ▶ to select **Off**, **On**, or **Flash**.
Notes: Does not function when [Light Mode](#) (in the **GLOB** menu) is set to **Stlth**. [Light Mode](#) has to be set to **Norml**, **Key**, or **Ignre** for the backlight to come on *only* during a transmission.

Alarm: Sets the selected audio alarm to play at the beginning of each transmission or anytime the scanner stops on the object while scanning. Default is **None**.
Press ◀ or ▶ to select **None**, **Chirp**, **Hi-Lo**, **Alert**, **Ring**, **2-Chirp**, **Fast Hi-Lo**, or **DTMF #**.
Note: [Alert Mode](#) (in the **GLOB** menu) must be set to **Tone** or **Both** for the audio alarm to function.

Fav: When set to 'Yes', the object is *also* assigned to the 'Favorites List' (list #21). Default is **No**.
Press ◀ or ▶ to select **Yes** or **No**.

SkyWarn: When set to 'Yes', the object is *also* assigned to the 'Skywarn List' (list #22). Default is **No**.
Press ◀ or ▶ to select **Yes** or **No**.

Modulation: Selects the receive mode for the object. Auto will work fine unless you want to force a mode. Default is **Auto**.
Press ◀ or ▶ to select:
Auto - automatically detects the receive mode.
AM - forces **AM** mode.
FM - forces **FM** mode.
NFM - forces **NFM** mode.

Atten: When set to 'On', applies 20 dB of attenuation to the object. Useful in areas where interference from nearby strong signals is present. Default is **Off**.
Press ◀ or ▶ to select **On** or **Off**.

Note: [AttenMode](#) must be set to **Normal** for this setting to apply.
You can also toggle this setting by pressing **ATT** when the object is in the display in Scan mode.

Delay: When set to 'On', a delay is used to wait for reply traffic after a transmission according to the [Delay Time](#) setting for the object. Default is **On**.
Press ◀ or ▶ to select **On** or **Off**.

Note: You can also do this by pressing **FUNC** then **.(DELAY)** when the object is in the display in manual, program, or scan modes.

Delay Time: Sets the delay time used when [Delay](#) is set to **On**.

Enter the amount of time, **1-250** (.1 - 25 seconds), to set the delay. Default is **20** (2 secs).

Digital AGC: When set to 'On', instantly compensates for low user audio levels that are common on digital systems. 'G' (**On**) or 'g' (**Off**) will appear in the right of the display when a channel is active to indicate AGC status. Default is **On**.

Press ◀ or ▶ to select **On** or **Off**.

SuperTrack: Alternative [DSP](#) decoding algorithm. When set to 'On', may help reception on some systems. Default is **On**.

Press ◀ or ▶ to select **On** or **Off**.

AudioBoost: When set to 'On', sets a 6 dB boost to audio levels when the object is active. Default is **Off**.

Press ◀ or ▶ to select **On** or **Off**.

Hit Count: When [Hit Counts](#) (in the **GLOB** menu) is set to 'On', will increment each time a transmission is received on the object.

Enter a number (**0-9999**) to change the count if you wish or press **F3 (Dflt)** to reset to **0**.

TSYS (Trunked System) Menu

[Contents](#)

The Trunked System menu is used when *editing* trunking system objects. To *create* a Trunked System object see [Creating Objects](#). Trunked system objects are assigned object numbers automatically but are not assigned to scan lists; just the talkgroups associated with the system are assigned to the scan lists. There is a 32 control channel limit for a trunking system. Large Multi-site systems with more than 32 control channels will have to be broken up into smaller systems. '[Duplication](#)' will copy a system but each ID can only be associated with one system. You will have to re-enter (or duplicate) all the IDs for the new system. That's when the software comes in handy.

To *Edit* an existing Trunked System object press **PGM** then **F2 (EDIT)**.

Press ▶ until **TSYS** is over **F3** then press **F3**.

Press ▼ or ▲ to scroll to the trunked system and press **F2 (EDIT)**. See also [Finding Objects](#).

Use ▼ or ▲ to select each option.

Menu changes do not take effect until the menu is saved-F1 (Save).

If you forget to save any changes, you will see 'Unsaved Changes! Go Back?'

Press **F1 (Yes)** to go back or **F3 (No)** to exit without saving.

If you are *creating a new trunked system*, you will be returned to the Talkgroup Menu when you save the Trunking System Menu.

Then go to the [Talkgroup Menu](#) to finish editing the Group Wildcard ID that was automatically created.

Type	Narrow FM	SuperTrack	Threshold Hi (Motorola/P25 only)
Tag	AudioBoost	AutoMove HRs (LTR only)	Threshold Lo (Motorola/P25 only)
Frequencies	Dwell	Invert Data (EDACS Narrow only)	T Tables (Motorola/P25 only)
L/Out	DIG AGC	Multi-Site (Motorola/P25 only)	Fleet Map (Motorola Type I/II only)
Atten		Check All CC (Motorola/P25 only)	

Type: Selects the type of trunking system. **Note for Motorola/P25 systems:** If you are not sure if the system is Motorola or P25, look at the **system voice** in the [RR database](#) for your system. Those entries that say *System Voice: Analog and APCO-25 Common Air Interface* are not true Project 25 systems as they have one or more analog talkgroups. Program these systems as a **MOT** system and let the scanner detect the digital. If the System Voice says *System Voice: APCO-25 Common Air Interface Exclusive* then the system is a true Project 25 system and program it as a **P25** system.

Press ◀ or ▶ to select:

MOT 800/900 - for Motorola 700/800/900 MHz *analog* or *mixed* (analog and digital) trunked radio systems that use the 3600 baud control channel.

MOT VHF/UHF - for Motorola VHF/UHF *analog* or *mixed* (analog and digital) trunked radio systems.

P25 MANUAL - for Motorola 700/800/900/VHF/UHF Project 25 systems where it is necessary to manually set the channel table information or if you wish to use the default table data (for 700/800/900 MHz systems).

P25 AUTO - for most Motorola 700/800/900/VHF/UHF Project 25 systems that send channel table information over the system control channel.

EDACS STD - for most 800 MHz EDACS systems using a 9600 BPS control channel.

EDACS NARROW - for most 900 MHz and some VHF/UHF EDACS systems using a 4800 BPS control channel.

LTR - for Logic Trunked Radio (LTR) systems.

Tag: Press **SEL/ENT** to change the default object name-'System' to something different.

See [Enter text](#) or [Enter Qtext](#).

Frequencies: Press **SEL/ENT** to enter the frequencies for the trunking system. For Motorola systems you only need to enter the control channel frequencies.

Note: EDACSs frequencies also have to be entered in LCN order. See [Finding EDACS LCN Order](#).

See also [BandPlan](#) and [FlexStep](#) settings (in the 'Expert Settings' menu) for step size defaults.

Enter the **frequency** and press **SEL/ENT**.

Press ▼ to move to the next channel number and repeat for all the frequencies.

Press **F1 (Save)** to exit.

L/Out: Sets the lockout status of the system. Default is **Off**.

Press ◀ or ▶ to select **On** or **Off**.

Atten: When set to 'On', applies 20 dB of attenuation to all transmissions in the system. Useful in areas where interference from nearby strong signals is

present. Default is **Off**.

Press ◀ or ▶ to select **On** or **Off**.

Note: [AttenMode](#) must be set to **Normal** for this setting to apply.

You can also toggle this setting by pressing **ATT** while monitoring any talkgroup in the system.

Narrow FM: Use **Yes** when the system is known to use Narrow FM modulation. Most 900 MHz analog trunked radio systems utilize NFM modulation. Default is **No**.

Press ◀ or ▶ to select **Yes** or **No**.

AudioBoost: When set to 'On', sets a 6 dB boost for all activity on the system. Default is **Off**.

Press ◀ or ▶ to select **On** or **Off**.

Dwell: Sets the amount of time the scanner dwells on a Motorola, P25, or EDACS system control channel for activity on programmed talkgroups. Use (default) **0** for automatic mode, which uses control channel information to determine when all current talkgroup information has been broadcast by the system.

Enter the amount of time, **0-200** (0 - 20 seconds), for the delay. Default is **0**.

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DIG AGC: When set to 'On', instantly compensates for low user audio levels that are common on digital systems. 'G' (**On**) or 'g' (**Off**) will appear in the right of the display when a channel is active to indicate AGC status. Default is **On**. **Note:** If you program a channel as NFM that is transmitting in FM mode, the audio will sound too loud. Similarly, if you program a channel as FM that is transmitting in NFM mode, the audio will sound too quiet. Incorrectly matching the modulation setting to the actual modulation used is the biggest reason for unbalanced audio between channels.

Press ◀ or ▶ to select **On** or **Off**.

SuperTrack: Alternative [DSP](#) decoding algorithm. When set to 'On', may help reception on some systems. Default is **On**.

Press ◀ or ▶ to select **On** or **Off**.

AutoMove HRs (LTR only): When set to 'On', allows you to enter the LTR system frequencies in any order and the scanner will automatically move the frequencies to the proper home repeater slots as transmissions are received on the system. Default is **Off**.

Press ◀ or ▶ to select **On** or **Off**.

Invert Data (EDACS Narrow only): For some EDACS Narrow systems, the control channel data may need to be inverted if you can't receive (hear) the control channel. Default is **No**.

Press ◀ or ▶ to select **Yes** to invert or **No**.

Multi-Site (Motorola/P25 only): Used with Motorola Networked and P25 trunked radio systems. The multi-site feature mainly concerns how the scanner "looks" at the control channels you have programmed into a particular system object. Default is **Off**. [\[8\]](#) See also [\[15\]](#).

Press ◀ or ▶ to select:

Off - the scanner will find the first usable control channel in the control channel list and use it to track the system.

Roam - while (you are) moving, the scanner will attempt to lock on the best site it can find. The scanner will always attempt to lock on to control channels where the decoding quality is greater than 'Threshold Hi', and will search for new control channels when the decoding quality of a control channel drops below 'Threshold Lo' (see next entries below). If no control channels are available that meet the Threshold Hi criteria, the scanner will seek the best control channel to use, and continue checking periodically for a new control channel that meets the Threshold Hi criteria.

Stat - intended to allow you to scan through *all* decent quality control channels while stationary (say, at home or work) so that you can hear all of the available traffic on all of the available receivable decent quality control channels depending on the [Check All CC](#) setting below. [\[8\]](#)

Threshold Hi (Motorola/P25 only): When [Multi-Site](#) is set to **Roam**, sets the control channel decode % threshold for a site to be considered good when looking for a new site.

Enter the percentage (**1-99**) and press **SEL/ENT**. Default setting is **95**(%).

Threshold Lo (Motorola/P25 only): When [Multi-Site](#) is set to **Roam**, sets the control channel decode % threshold for a site to be considered out of range, which will begin the process of looking for a new site.

Enter the percentage (**1-99**) and press **SEL/ENT**. Default setting is **75**(%).

Check All CC (Motorola/P25 only): When [Multi-Site](#) is set to **Stat** (stationary) This setting determines how the scanner scans the control channels. Default is **Off**.

Press ◀ or ▶ to select **Off** or **On**.

Off - the scanner will check a new control channel on each pass, starting with the next frequency in line after the previous pass. It will check only one control channel per pass. [\[2\]](#)

The scanner will park on a different *decent* quality control channel each time it scans that system. [\[8\]](#)

On - the scanner will park on each *decent* control channel in the list successively looking for programmed talk groups BEFORE leaving that system and moving on to other system's or conventional channels. [\[8\]](#)

T Tables (Motorola/P25 only): Allows you to select the default trunking table or to customize the tables for each type of system. Trunking tables are required so the scanner can correctly determine the voice channel frequencies. Trunking table information can usually be found in the [Radio Reference Database](#) for implicit and VHF/UHF systems. The [Win500](#) and [PSREdit500](#) software will also allow you to select the tables needed for each type of system.

For Splinter Systems (analog 800Mhz systems with frequencies between 866-869 MHz [or rebanded 851-854 MHz] ending with 0 instead of 5 e.g. 852.1250, not 852.1375) select **Splintr**.

For Motorola/P25 Systems there are two types of systems: Explicit mode and Implicit mode channel assignment. Explicit mode systems include all information needed to determine voice frequencies on the control channel. For *Explicit* mode systems, leave this setting at **Default**. The system will automatically detect the band plan and populate the table for the system. You must supply the system's band plan for *Implicit* systems for the scanner to correctly determine voice frequencies.

For Rebanded Motorola Systems you must select **Custom** and create a custom band plan. For Motorola 800 MHz rebanded table entries see [this post](#).

For VHF and UHF Systems **Custom** will be the only option. You must program the applicable lo channel, hi channel, offset, base frequency, and step for the system. I have found an explanation at the [Trunked Radio Systems User's Page](#) that describes how to find some of this information. Look for 'Determining Base and Offset Frequencies for the BC245xt' by John C. See also this [post](#) for UHF systems. [Radio Reference.com](#) also has an explanation. Inquire at [Radio Reference.com Forums](#) to find more information about specific systems.

Press ◀ or ▶ to select **Default**, **Splintr**, or **Custom**. VHF/UHF systems will only have **Custom** for an option.

If **Custom** is selected, press **SEL/ENT** to edit the tables.

Press ◀ or ▶ to select **Table 1-16** and press **SEL/ENT**.

Enter the **Lo Channel** and press **SEL/ENT**.

Enter the **Hi Channel** and press **SEL/ENT**.
Enter the **Offset** and press **SEL/ENT**.
Enter the **Base Frequency** and press **SEL/ENT**.
Enter the **Step** and press **SEL/ENT**.
Press **F1 (Save)** to save the table and exit.
Press **▼** to move to the next table number (as needed) and repeat.
Press **F1 (Save)** to save *all* trunking tables and exit.

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Fleet Map (Motorola Type I/II only): Motorola Type I and Type II systems require you to program a fleet map. This allows you to receive the talkgroup IDs correctly. If you don't know which fleet map to use, you can try a method I found at [Radio Reference.com](#), [Determining Type I Motorola Fleet Maps](#) by Dave Goodson. If you know the fleet map by name, E1P1, E1P2, etc., I have listed 16 pre-set [fleet maps](#) so you can see the size codes.

Press **◀** or **▶** to select one of the **pre-set fleet maps**, or **Custom**.

If **Custom** is selected, press **SEL/ENT** to edit the size codes for the blocks.

Press **▼** to select the Block (**0-7**) then press **◀** or **▶** to select the size code **S(0-14)**.

Press **▼** to move to the next **Block** and repeat for all the blocks (as needed).

Press **F1 (Save)** to save the fleet map and exit.

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. For example, if you assign Block 0 as S-12, the scanner prompts you for block 2, the next block available, instead of block 1. If you assign Block 0 as S-14, you would not see another prompt because S-14 uses all available blocks.

TalkGroup Menu

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Here is where you edit talkgroup IDs. To *create* a Talkgroup object see [Creating Objects](#). If you have a lot of IDs to program and don't have the software, '[Duplication](#)' will be your best friend. This will allow you to set all the parameters for an ID, i.e. delay, LED color, etc., duplicate it, and just change the ID number.

To **edit** an existing Talkgroup object press **PGM** then press **F2 (EDIT)**.

Press **▶** until **TGRP** is over **F3** then press **F3**.

Press **◀** or **▶** to select the Scan List where the object is located. Press **▼** or **▲** to locate the object in the list.

Press **F2 (EDIT)** then **F2 (CURR)**. See also [Finding Objects](#).

Use **▼** or **▲** to select each option.

Menu changes do not take effect until the menu is saved-F1 (Save).

If you forget to save any changes, you will see '**Unsaved Changes! Go Back?**'.

Press **F1 (Yes)** to go back or **F3 (No)** to exit without saving.

[Scan Lists](#)

[TSYS](#)

[ID](#)

[Type](#)

[Tag](#)

[L/Out](#)

[Priority](#)

[LED Mode](#)

[LED Color](#)

[Latch LED](#)

[Backlight](#)

[Alarm](#)

[Fav](#)

[SkyWarn](#)

[Delay](#)

[Delay Time](#)

[AudioBoost](#)

[Hit Count](#)

Scan Lists: This is where you select which Scan List(s) you want the ID to be in for scanning.

Press **◀** or **▶** to select the list (**01-22**) then press **SEL/ENT** to select any/every list you want the talkgroup object to be in. A * (asterisk) will appear in front of each list the object will be assigned to.

Note: The * will *always* be in front of the [Default Scan List](#). If you want to select a different list, don't forget to deselect the default Scan List.

TSYS: This is where you select a (1) trunking system or [create a new trunking system](#) to be associated with the ID.

Press **◀** or **▶** to select the **trunking system** you want the ID to be in.

ID: This is where you enter the talkgroup ID (or private/radio ID) number. A 'Wildcard' is a special type of ID object that allows you to monitor *all* Talk Group traffic on the trunked system and is created by default. IDs can be classified as '[Group](#)' or '[Private](#)'. Wildcard IDs monitor all Talk Group traffic on the system and you have the option to store (**F3**) or lock out (**F1**) new Talk Groups as they appear. See also [ID Formats](#).

Press **F3 (Dflt)** for a **Wildcard ID**.

Enter a **Motorola Type II ID** - a **1-5-digit ID number**. Valid Talk Group IDs are divisible by 16.

Enter a **Motorola Type I ID** - **fff-ss** where **fff** is the fleet and **ss** is the sub-fleet.

Enter a **EDACS ID (AFS)** - **aa-ffs** where **aa** is the agency, **ff** is the fleet, and **s** is the sub-fleet.

Enter a **EDACS ID (Decimal)** - the default EDACS format is **AFS**. If you want to enter in Decimal format you will have to change [TGID Format](#) (in the **GLOB** menu) to '**Decimal**' first, then enter the **1-4 digit ID number**.

Enter a **LTR ID** - **a-hh-uuu** where **a** is the area code (0 or 1), **hh** is the home repeater (01-20), and **uuu** is the user ID (000-254).

Enter a **Radio ID** - a **1-8 digit Radio number**.

Type: Selects the [ID Type](#). Default is **Group**.

Press **◀** or **▶** to select:

Group - will only monitor *Talk Group* radio traffic on the specified Talk Group ID.

Private - will only monitor *private* radio traffic on the specified Private ID (or Radio ID).

IDs designated as 'Private' can also be tagged and viewed on line 5 of the display when '[Show RadioID](#)' (in the '**Expert Settings**' menu) is set to **Yes**.

Tag: Press **SEL/ENT** to change the default ID name-**'ID'** to something different.

See [Entering text](#) or [Using Quick Text](#).

L/Out: Sets the lockout status of the ID. Default is **Off**.

Press **◀** or **▶** to select **On** or **Off**.

Note: locking out Talk Group IDs that have private Radio IDs associated with them will also lock out those private Radio IDs.

Priority: When set to 'On', the ID will be given priority over other IDs when [Priority](#) (in the **GLOB** menu) is *also* set to **On**. Default is **Off**. See also [Priority Scanning](#).

Press ◀ or ▶ to select **On** or **Off**.

Note: You can also do this by pressing **PRI** when the ID is in the display in manual, program, or scan modes.

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LED Mode: Controls whether the Alert LED flashes or remains on solid at the beginning of each transmission or anytime the scanner stops on the ID while scanning. Default is **Solid**.

Press ◀ or ▶ to select **Flash** or **Solid**.

Notes: [Alert Mode](#) (in the **GLOB** menu) must be set to **Light** or **Both** for the LED to function.

(Base only) [Dim LED](#) (in the **GLOB** menu) must be set to **No** if [Light Level](#) (in the **GLOB** menu) is set to **Off** for the LED to function.

LED Color: Sets the LED color for the object [as defined](#) (in the **GLOB** menu). Default is **0**.

Press ◀ or ▶ to select the color **0-7**.

Latch LED: When set to 'On', the Alert LED will remain in the [LED Mode](#) after the transmission is complete or until it is overridden by the next object that is also using an Alert LED. Default is **Off**.

Press ◀ or ▶ to select **On** or **Off**.

Backlight: Sets how the backlight will function while the ID is active. Default is **Off**.

Press ◀ or ▶ to select **Off**, **On**, or **Flash**.

Notes: Does not function when [Light Mode](#) (in the **GLOB** menu) is set to **Stlth**. [Light Mode](#) has to be set to **Norml**, **Key**, or **Ignre** for the backlight to come on *only* during a transmission.

Alarm: Sets the selected audio alarm to play at the beginning of each transmission or anytime the scanner stops on the ID while scanning. Default is **None**.

Press ◀ or ▶ to select **None**, **Chirp**, **Hi-Lo**, **Alert**, **Ring**, **2-Chirp**, **Fast Hi-Lo**, or **DTMF #**.

Note: [Alert Mode](#) (in the **GLOB** menu) must be set to **Tone** or **Both** for the alarm to function.

Fav: When set to 'On', the ID is *also* included in the '[Favorites List](#)' (list #21). Default is **No**.

Press ◀ or ▶ to select **Yes** or **No**.

SkyWarn: When set to 'On', the ID is *also* included in the '[Skywarn List](#)' (list #22). Default is **No**.

Press ◀ or ▶ to select **Yes** or **No**.

Delay: When set to 'On', a delay is used to wait for reply traffic after a transmission according to the [Delay Time](#) setting for the object. Default is **On**.

Press ◀ or ▶ to select **On** or **Off**.

Note: You can also do this by pressing **FUNC** then **.(DELAY)** when the object is in the display in manual, program, or scan modes.

Delay Time: Sets the delay time used when [Delay](#) is set to **On**.

Enter the amount of time, **1-250** (.1 - 25 seconds), to set the delay. Default is **20** (2 secs).

AudioBoost: When set to 'On', sets a 6 dB boost to audio levels when the ID is active. Default is **Off**.

Press ◀ or ▶ to select **On** or **Off**.

Hit Count: When [Hit Counts](#) (in the **GLOB** menu) is set to 'On', will increment each time a transmission is received on the object.

Enter a number (**0-9999**) to change the count if you wish or press **F3 (Dfit)** to reset to **0**.

Search/Signal Stalker/Spectrum Sweeper Object Menu

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These menus are used when editing Stalker/Sweeper, Service, and Limit Search objects.

To create a Stalker/Sweeper, Service, or Limit Search object see [Creating Objects](#).

Go here to use the [Dedicated Searches](#) that are not used when scanning objects.

See also [BandPlan](#) and [FlexStep](#) settings (in the '**Expert Settings**' menu) for step size defaults.

To **Edit** an existing Search object press **PGM** then press **F2 (EDIT)**.

Press ▶ until **SRCH** or **STLK/SWPR** is over **F3** then press **F3**.

Press ◀ or ▶ to select the Scan List where the object is located. Press ▼ or ▲ to locate the object in the list.

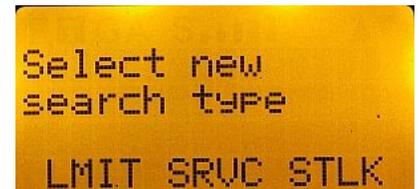
Press **F2 (EDIT)** then **F2 (CURR)**. See also [Finding Objects](#).

Use ▼ or ▲ to select each option.

Menu changes do not take effect until the menu is saved-F1 (Save).

If you forget to save any changes, you will see '**Unsaved Changes! Go Back?**'.

Press **F1 (Yes)** to go back or **F3 (No)** to exit without saving.



Options for All Search Objects: See also [SearchTunes](#) (in the '**Expert Settings**' menu) to set the maximum number of frequencies to check in each search object while scanning.

[Scan Lists](#)

[LED Mode](#)

[Backlight](#)

[Atten](#)

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Options for Service Search Objects:

[Srcv](#)

[Groups \(PubSafty,Aircraft,Amateur only\)](#)

[Channels \(CB,Marine,F/G/MURS only\)](#)

[Modulation](#)

Options for Limit Search Objects:

Options for All Search Object Options

Scan Lists: This is where you select which Scan List(s) you want the object to be in for scanning.

Press ◀ or ▶ to select the list (**01-22**) then press **SEL/ENT** to select any/every list you want the object to be in. A * (asterisk) will appear in front of each list the object will be assigned to.

Note: The * will *always* be in front of the [Default Scan List](#). If you want to select a different list, don't forget to deselect the default Scan List.

Tag: Press **SEL/ENT** to change the default object name to something different.

See [Enter text](#) or [Enter Qtext](#).

L/Out: Sets the lockout status of the object. Default is **Off**.

Press ◀ or ▶ to select **On** or **Off**.

LED Mode: Controls whether the Alert LED flashes or remains on solid at the beginning of each transmission or anytime the scanner stops on the object while scanning. Default is **Solid**.

Press ◀ or ▶ to select **Flash** or **Solid**.

Notes: [Alert Mode](#) (in the **GLOB** menu) must be set to **Light** or **Both** for the LED to function.

(Base only) [Dim LED](#) (in the **GLOB** menu) must be set to **No** if [Light Level](#) (in the **GLOB** menu) is set to **Off** for the LED to function.

LED Color: Sets the LED color for the object ([as defined](#) in the **GLOB** menu). Default is **0**.

Press ◀ or ▶ to select the color **0-7**.

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Latch LED: When set to '**On**', the Alert LED will remain in the [LED Mode](#) after the transmission is complete or until it is overridden by the next object that is also using an Alert LED. Default is **Off**.

Press ◀ or ▶ to select **On** or **Off**.

Backlight: Sets how the backlight will function while the object is active. Default is **Off**.

Press ◀ or ▶ to select **Off**, **On**, or **Flash**.

Notes: Does not function when [Light Mode](#) (in the **GLOB** menu) is set to **Stlth**. [Light Mode](#) has to be set to **Norml**, **Key**, or **Ignre** for the backlight to come on *only* during a transmission.

Alarm: Sets the selected audio alarm to play at the beginning of each transmission or anytime the scanner stops on the object while scanning. Default is **None**.

Press ◀ or ▶ to select **None**, **Chirp**, **Hi-Lo**, **Alert**, **Ring**, **2-Chirp**, **Fast Hi-Lo**, or **DTMF #**.

Note: [Alert Mode](#) (in the **GLOB** menu) must be set to **Tone**, or **Both** for the alarm to function.

Fav: When set to '**Yes**', the object is *also* included in the '[Favorites List](#)' (list #21). Default is **No**.

Press ◀ or ▶ to select **Yes** or **No**.

Atten: When set to '**On**', applies 20 dB of attenuation to the object. Useful in areas where interference from nearby strong signals is present. Default is **Off**.

Press ◀ or ▶ to select **On** or **Off**.

You can also toggle this setting by pressing **ATT** when the object is in the display in Scan mode.

Delay: When set to '**On**', a delay is used to wait for reply traffic after a transmission according to the [Delay Time](#) setting for the object. Default is **On**.

Press ◀ or ▶ to select **On** or **Off**.

Note: You can also do this by pressing **FUNC** then **.(DELAY)** when the object is in the display in manual, program, or scan modes.

Delay Time: Sets the delay time used when [Delay](#) is set to **On**.

Enter the amount of time, **1-250** (.1 - 25 seconds), to set the delay. Default is **20** (2 secs).

Zeromatic: (not with CB,Marine,F/G/MURS) When set to '**On**', enhances the scanner's ability to lock on to the actual center frequency of a search hit instead of an adjacent frequency. Default is **On**.

Press ◀ or ▶ to select **On** or **Off**.

Note: You can also do this by pressing **FUNC** then **0** when the object is in the display in search or scan modes.

Search Dir: Press ◀ or ▶ to select the search direction, **Up** or **Down**. Default is **Up**.

Hit Count: When [Hit Counts](#) (in the **GLOB** menu) is set to **On**, this will increment each time a transmission is received on the object.

Enter a number (**0-9999**) to change the count if you wish or press **F3 (Dflt)** to reset to 0.

Stalker/Sweeper Search Options

Type: Allows you to search from [All bands](#) or just [Public Safety Bands](#). Default is **All Bands**.

Press ◀ or ▶ to select:

All Bands - will allow you to search from all the sub-bands the scanner can receive.

Pub Safety - will allow you to search from just the Public Safety sub-bands.

Sub-bands: Allows you to select which [Stalker/Sweeper Bands](#) that will be searched.

If you selected **All Bands** press ◀ or ▶ to select each band **0-9** then press **SEL/ENT** to turn it on or off for search. Default is **0,2,5,7,8**.

If you selected **Public Safety Bands** press ◀ or ▶ to select each band **0-4** then press **SEL/ENT** to turn it on or off for search. Default is **0,1,2,3,4**.

A * (asterisk) will appear in front of each selected band to be searched.

Special: Turns [Special Signal Stalker/Spectrum Sweeper](#) on or off. Default is **Off**.

Press ◀ or ▶ to select **On** or **Off**.

Services Search Options

Srvc: Allows you to select the type of service search. Default is **Pub Safety**.
Press ◀ or ▶ to select **Pub Safety, Aircraft, Amateur, CB, Marine, FRS/GMRS/MURS, or Railroad**.

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Groups (PubSafty,Aircraft,Amateur only): Allows you to select which [groups](#) that will be searched for **Pub Safety, Aircraft, and Amateur** service searches. Default is **All Groups On**.
Press ◀ or ▶ to select each group then press **SEL/ENT** to enable the group. A * (asterisk) will appear in front of each selected group to be searched.

Channels (CB,Marine,F/G/MURS only): Allows you to select which [channels](#) will be searched for **CB, Marine, and FRS/GMRS/MURS** service searches. Default is **All Channels**.
Press **SEL/ENT**. Press ▼ or ▲ to locate the channels you want to scan. Press **SEL/ENT** to disable or enable each channel. A * (asterisk) will appear in front of each selected channel to be searched.

Modulation: Selects the receive mode for the Service Search object. Auto will work fine unless you want to force a mode. Default is **Auto**.
Press ◀ or ▶ to select:
Auto - automatically detects the receive mode.
AM - forces **AM** mode.
FM - forces **FM** mode.
NFM -forces **NFM** mode.

Limit Search Options

FrLo: Enter the lower frequency of the limit search and press **SEL/ENT**. See also [BandPlan](#) and [FlexStep](#) settings (in the 'Expert Settings' menu) for step size defaults.

FrHi: Enter the upper frequency of the limit search and press **SEL/ENT**.

Modulation: Selects the receive mode for the Limit Search object. Auto will work fine unless you want to force a mode. Default is **Auto**.
Press ◀ or ▶ to select:
Auto - automatically detects the receive mode.
AM - forces **AM** mode.
FM - forces **FM** mode.
NFM -forces **NFM** mode.

Duplicating Objects

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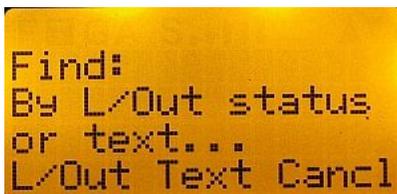
Duplication is especially useful when entering multiple TGRP objects in the same trunked system or multiple CONV objects that have similar parameters or tag names.

To Duplicate an Object:

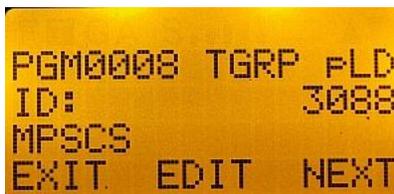
Press **MAN**. Press ◀ or ▶ to select the Scan List where the object is located.
Press ▼ or ▲ to locate the object in the scan list.
Press **PGM** then **F2 (EDIT)** then **F1 (DUPE)**.

An exact copy of the object you selected is created and assigned to the Scan List you copied the object from. The scanner then displays the newly created object menu so you can change the parameters that need to be changed. Edit any parameters you wish and press **F1 (Save)** when you are finished.

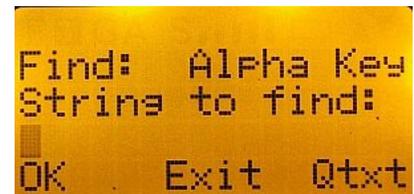
Note: as soon as you press **DUPE** an object is created and stored. Pressing **F1 (Save)** will only save changed parameters.



Find Menu



Find by Lockout Status



Find by Text

Finding Objects

There are many different ways to locate objects:

1. By Object Number:

Press **MAN**, the object number, then **SEL/ENT**.
To edit the object, press **PGM** then **F2 (EDIT)** then **F2 (CURR)**.

2. By Browsing:

Press **MAN**. Press ◀ or ▶ to select the Scan List where the object is located.
Press ▼ or ▲ to locate the object in the scan list.
To edit the object, press **PGM** then **F2 (EDIT)** then **F2 (CURR)**.

Note: Trunking Systems are not assigned to Scan Lists and cannot be found using the ▼, ◀, ▲, or ▶ keys in Manual or Program Modes. See next entry to use the Edit Method.

3. By Object Type:

Press **PGM** then **F2 (EDIT)** then ▶ until **CONV, TGRP, TSYS, SRCH, or STLK/SWPR** is over any softkey (**F1, F2, or F3**)
Press the softkey under the object type you wish to locate.
Press ◀ or ▶ to select the Scan List where the object is located.
Press ▼ or ▲ to locate the object in the list.
To edit the object, press **F2 (EDIT)**.

4. By Text:

Press **PGM** then **F2 (EDIT)** then **F3 (FIND)** then **F2 (Text)**.
Enter the string of text to find or press **F3 (Qtxt)** to insert any [Programmed Quicktext](#).

Press **F1 (OK)** to search. Press **F3 (NEXT)** to search again.
To edit the object, press **F2 (EDIT)**.

5. By L/Out Status: Note: Temporary lockout are not shown.

Press **PGM** then **F2 (EDIT)** then **F3 (FIND)** then **F1 (L/Out)**. Press (or press and hold) **F3 (Next)** to locate the object in the list.
Press **L/OUT** to unlock.
To edit the object, press **F2 (EDIT)** then **F2 (CURR)**.

Deleting Objects

Locate the object *using one of the first three methods* (not FIND) above then press **PGM**.
Press **FUNC** then **CL**.

Scanning the Scan Lists

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Turning Scan List On and Off

Press the number key assigned to the Scan List. For double-digit Scan Lists, press **FUNC** then the second digit of the Scan List. Example: **FUNC** then **8** for list 18.

To use the Favorites List press **FAV**. Press **SCAN** to exit.
To use the Skywarn List press **FUNC** then **WX**. Press **SCAN** to exit.

Storing...

To store an ID found with a Wildcard ID press **F3 (Stor)**. The ID will be assigned to the *current* Scan List. Then see the [TGRP Menu](#) to customize the ID.
To store any search frequency (Limit, Service, Tune, or Stalker/Sweeper) press **F3 (Stor)**.
The frequency will be assigned to the *default* Scan List. Any tone/code/NAC will also be stored (if [enabled](#)) with the frequency. Then see the [CONV Menu](#) to customize the channel.
To store a CTCSS/DCS/NAC tone/code (if [enabled](#)) press **F3 (Stor)**.

Using Pause and Manual

Pause (PSE) will pause any scan or search and monitor that single object or frequency. Press **PSE** again to resume.
PAUSE pauses the scanner but keeps the scanner in scan or search mode.
If you press **PSE** while viewing a Wildcard ID, the scanner will monitor only the talkgroup the scanner is paused on.

Manual (MAN) will pause Scan Mode and allow you to monitor that object.

MAN stops scan mode and allows you to select other objects to monitor including search objects.

To monitor an object, press **MAN**, enter an object number and press **SEL/ENT**. If the number isn't in use, the scanner will just beep.
If you press **MAN** while viewing a Wildcard ID, the scanner will monitor all active IDs in that system.

MAN will also recall the last object or frequency stored or received in Scan or Search Modes. If that object is in multiple lists, the scanner displays the lowest number Scan List that the object is in.

Temporary/Permanent Object Lockout

To Lockout an ID found with a Wildcard ID press **F1 (TGL/O)**. This will create an object for the ID and then permanently lock it out.

To Lockout a Search Frequency within a search object or in a dedicated search press **F1 (FrL/O)**. This will permanently lockout the frequency.

The **F1 softkey (FrL/O)** permanently locks out search frequencies when searching, and **(TGL/O)** permanently locks out talkgroups found with the Wildcard IDs and both will not perform temporary lockouts.

Note: By default, pressing the **L/OUT** button toggles a *temporary* lockout (on or off) and **FUNC** then **L/OUT** toggles a *permanent* lockout for an object. To change the **L/OUT** button to toggle a permanent lockout when pressed and **FUNC** then **L/OUT** to toggle a temporary lockout see [Setting the Function of the L/OUT Button](#) (in the **GLOB** menu). I will use the default setting to explain the following.

Anything that has **(TGL/O)** in the display above **F1 (ID found with a wildcard ID)** has to be (can only be) *permanently* locked out with the **F1** softkey.

Anything that has **(FrL/O)** in the display above **F1 (search/stalker/sweeper frequency)** has to be (can only be) *permanently* locked out with the **F1** softkey.

Anything that has the lowercase 'l' in the upper right of the display (**CONV**, **TSYS**, **TGRP**, or wildcard ID *object*) can be temporarily locked out (**L/OUT** button) or permanently locked out (**FUNC** then **L/OUT** button).

Temporary Lockout (L/OUT button) locks out conventional objects, *programmed* talkgroup objects (not IDs found with Wildcard IDs), and *programmed* search objects (not frequencies *within* search objects) only until the scanner is turned off. When the scanner is powered on again, all objects that have been temporarily locked out are unlocked.

To Temporarily Lockout a Programmed Object:

When the scanner stops on an object, press the **L/OUT** button.

Or, In Manual or Program Mode,

Press ◀ or ▶ to select the Scan List where the object is located.

Press ▼ or ▲ to locate the object in the list.

Press the **L/OUT** button.

The lowercase 'l' flashes in the display to show the object is temporarily locked out.

Permanent Lockout (FUNC then L/OUT button) locks out conventional objects and *programmed* talkgroup objects (not IDs found with Wildcard IDs), and *programmed* search objects (not frequencies *within* search objects) permanently until they are unlocked.

To Permanently Lockout a Programmed Object:

When the scanner stops on an object, press **FUNC** then the **L/OUT** button.

Or, In Manual or Program Mode,

Press ◀ or ▶ to select the Scan List where the object is located.

Press ▼ or ▲ to locate the object in the list.

Press **FUNC** then the **L/OUT** button.

The uppercase 'L' appears in the display to show the object is permanently locked out.

To Lockout or Unlock a Trunked System:

Press **PGM** then **F2 (EDIT)**. Press ▶ until **TSYS** is over **F3** then press **F3 (TSYS)**.

Press ▼ or ▲ to scroll to the trunked system and press **FUNC** then **L/OUT** to toggle temporary lockout or **L/OUT** to toggle permanently lockout for the system.

Unlocking Objects See also [Find by L/O Status](#).

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To Unlock a Conventional, Talkgroup, or Search Object: (to unlock search frequencies *within* search objects see [Unlocking Search Frequencies](#)).

In Manual or Program Mode, press ◀ or ▶ to select the Scan List where the object is located.

Press ▼ or ▲ to locate the object in the list.

To unlock a temporary lockout press the **L/OUT** button. The flashing lowercase 'l' in the display turns solid to show the object is unlocked.

To unlock a permanent lockout press **FUNC** then the **L/OUT** button. The uppercase 'L' in the display changes to the lowercase 'l' to show the object is unlocked.

To Unlock a Trunked System:

Press **PGM** then **F2 (EDIT)**. Press ▶ until **TSYS** is over **F3** then press **F3 (TSYS)**.

Press ▼ or ▲ to scroll to the trunked system and press **FUNC** then **L/OUT** to toggle temporary lockout or **L/OUT** to toggle permanently lockout for the system.

Priority Scanning

To Turn Priority Scanning On press **FUNC** then **PRI** while scanning. All objects with their priority mode set to 'On' are given equal priority status. No object has higher priority over any another.

Conventional Priority Scanning will give priority to conventional objects that have their [priority mode set to 'On'](#). The scanner will sample the conventional objects for activity periodically while scanning and monitoring other objects. This sampling will cause a brief muting of received audio when it occurs while another object is active. The more conventional objects that are set for priority, the longer this audio muting will be, since it takes a certain amount of time to sample each priority conventional object for activity. It will not check for conventional objects when scanning search or Stalker/Sweeper objects.

Talk Group Priority Scanning will give priority to IDs that have their [priority mode set to 'On'](#). IDs with **priority on are checked for activity before any other IDs and during the delay time after non-priority ID calls**. On some trunked systems (e.g. Mot 3600 if the system is programmed for it, and LTR for some talkgroups), it will look at low-speed data on the voice frequency checking for any priority Talk Group information.

It will not check for IDs when receiving any other talkgroup.

It will not check for IDs when scanning conventional, search, or Stalker/Sweeper objects.

Priority does work for Radio IDs associated with 'Private' IDs.

Priority does *not* work for Radio IDs associated with 'Group' IDs, the scanner will only check the 'Group' IDs.

See also these Priority settings in the GLOB Menu:

The [Priority Channels](#) setting sets the number of *conventional* priority channels to check during priority scan (**default=0**).

The [Pri Interval](#) sets how often the scanner checks the priority channels (**default 2 secs**).

The [QuickPriRtn](#) setting when set to 'On', (default 'Off') will not wait for verification of correct CTCSS, DCS, or NAC when returning to an active conventional channel after priority sampling.

The [TGRP Pri Int](#) setting will interrupt trunked activity to check for conventional priority channels when set to (default) 'On'.

Weather Priority Scanning will give priority to a weather channel that has its priority mode set to 'On'. Weather Priority mode samples the specified weather frequency periodically while scanning to see if the 'All Hazards 1050 Hz Warning Alert Tone' (WAT) is present. If the WAT is present, the scanner will sound an alarm and tune to the specified weather frequency to monitor the nature of the alert.

The [WX Check Int](#) setting (in the 'Expert Settings' menu) allows you to set the interval of time to check for a weather alarm signal on a channel while scanning.

Using the Attenuator

The attenuator reduces the amount of signal at the receiver input (20 dB) and may help reduce interference from strong nearby transmitters. There are two attenuation modes, Normal and Global. Normal attenuation uses the attenuation settings for each object or search. Global attenuation forces attenuation for all objects, on or off

To Attenuate a Conventional Object press **ATT** anytime a conventional object is in the display.

To Attenuate a Trunking System press **ATT** anytime a talkgroup object is in the display.

To Attenuate a Search Object or Dedicated Search press **ATT** during the search.

To Turn Global Attenuation Mode Off press **FUNC** then **ATT** (no **G** in the display).

To Turn Global Attenuation Mode On press **FUNC** then **ATT** (**G** in the display).

To Turn Global Attenuation On press **ATT** (**GA** in the display).

To Turn Global Attenuation Off press **ATT** (**G** in the display).

Using the Favorites List and Skywarn List

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The Favorites List and Skywarn List are 2 list that can be scanned independently from the regular 20 lists. They scan the objects in their list only and no other lists. The Skywarn list is really just another Favorites list. The Favorites List is scan list #21 and the Skywarn List #22 when selecting lists in the menus. Objects in the Skywarn and Favorites lists can also be assigned to one or more of the other 20 lists.

The Favorites List is an easy way to scan one or just a few objects at a time without reprogramming anything as it is easy to add objects or clear the list.

To Add an object to the Favorites List press **FUNC** then **FAV** when the object is in the display. Or, when programming an object, select '21' in the 'Scan Lists:' option of the menu or 'Yes' in the 'FAV:' option of the menu.

To Scan the Favorites List press **FAV**. Press **SCAN** to exit.

To Clear the Favorites List press **PGM** then **GLOB**, scroll down to 'Clear FAV' and press **SEL/ENT**. At 'Really remove all objects from FAV scan list?', press **F1 (YES)**.

The Skywarn list is meant to be a more permanent list. Although the manual states "Instant access to frequencies used by storm spotter networks", you still have to program the frequencies yourself.

To Add an object to the Skywarn List when programming an object, select '22' in the 'Scan Lists:' option of the menu or 'Yes' in the 'SkyWarn:' option of the object menu.

To Scan the Skywarn List press **FUNC** then **WX**. Press **SCAN** to exit.

Optimizing Scanning Parameters

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Move your scanner/antenna to a different location. Sometimes just 12" helps. Digital is especially real fussy. Get a better antenna. The stock rubber duck/whip antennas are just average quality.

Conventional Scanning

Setting the squelch properly is the easiest and quickest way to receive channels better.

Set the [SQ Wait 1](#) (in the '**Expert Settings**' menu) down to **7** or **5**.

The minimum unmute delay for analog conventional channels is when [Sq Mode](#) is set to **CTCSS** or **DCS** and [CTCSS Hz](#) or [DCS Code](#) is set to **Search**.

Analog/Digital Trunking

The one thing that frustrated me most with the default settings is the constant blinking of an ID in the display while the scanner was trying to lock on to it. Here's what I did.

Move your scanner/antenna to a different location. Sometimes just 12" helps. You want that **II** in the upper left of the display to stay there as much as possible.

For Motorola systems/sites, only enter the *known* control channels/alternate control channels to speed up scanning. You don't need to program the voice channels.

There also are articles on [Simulcast Digital Distortion](#) and [Object Oriented Scanners Overload Issues](#) at RR.

Turning the squelch down a little will help pull in fringe sites especially for P25 decoding. It will scan multiple sites slower but gives the scanner time to lock onto the control channels.

Turning the squelch up a little will find the stronger sites faster and therefore move to the next site/system quicker.

If you are having trouble with garbled digital transmissions, try turning AGC on or off for the system or convention frequency.

In the '**Global Settings**' menu:

Turn the [TGRP Pri Int](#) setting '**Off**' so it will not interrupt trunked activity to check for conventional priority channels (set to default '**On**').

In the '**Expert Settings**' menu:

Set the [SQ Wait 1](#) (In-band SQ Timeout/Squelch Time Same Band in the software) down to around **5** (scan rate).

Set the [EndtoneMot](#) (Endtone Threshold in the software) down to around **80** for a Motorola system.

Set the [DG Int Prime](#) (Digital Detect Timeout/Digital Detect Time in the software) down to around **20-40**.

For Multi-site systems, program each site into its own Scan List first to see how well the site receives in different locations or conditions. See also [Analyzing Trunking Systems](#).

I would only use the [Multi-Site Roam](#) setting if there was only one control channel available at a time to monitor. This may be the case if you are located on the fringe of several weak sites. Set [Threshold Hi](#) to around **85** and [Threshold Lo](#) to about **55** for a wider threshold range than the default 95 Hi and 75 Lo. You don't need 95% signal quality to lock on to a site. This will monitor the strongest control channel and look for another only when the signal strength falls below the 'Threshold Lo' setting.

I don't like the **Roam** setting because it only monitors 1 strong control channel (site) which defeats the whole 'multi-site' concept IMHO. Yes, there may be *different* traffic on any other receivable control channels you have in the system that aren't being monitored. The [Multi-Site Stat](#) setting with [Check All CC](#) set to **On** will receive more *different* traffic whether you are roaming *or* stationary. It will monitor *all* receivable sites. My personal experience has given me the best results by programming each site as one system and putting it in its own Scan List and setting [Multi-Site](#) to **Off** for each system. You are usually in range of only 5-10 sites at any given location anyway so that's only 5-10 Scan Lists. This way you can see which sites are receivable by monitoring one Scan List at a time and looking for that little **II** in the upper left of the display.

If you don't want to waste that many Scan Lists on one multi-site system, put all the known good receivable sites for each location into one system assigned to one Scan List, set the [Multi-Site](#) setting to **Stat** and set [Check All CC](#) to **On**. This will monitor all control channels and sites. Or, a combination of both methods; put all the *strong* sites in one Scan List and the intermittent or fussy sites in their own list so you can enable those when conditions/locations are favorable. The ultimate goal is to make your scanner monitor only strong (receivable) control channels.

These are just my suggestions. You will have to experiment with different ways to find what works best for you. Factors like how busy the multi-site system is, how much traffic you want to listen to on *that* system, and how many other systems you want to listen to will determine the best way for you to setup each multi-site system.

Tune Search/Analyze Mode

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The scanner's TUNE mode allows you to quickly enter any frequency and monitor that frequency for transmissions, or search up or down from that frequency for activity. TUNE mode also displays information about trunking control channels and trunked voice channels it finds while tuning and other information for conventional frequencies depending on the [ADC Cal](#) setting in the '**Expert Settings**' menu.

TUNE search will always check for and display any CTCSS/DCS/NAC squelch, control channel information, and digital modulation each time it finds an active frequency.

Tune Search:

See also [BandPlan](#) and [FlexStep](#) settings (in the '**Expert Settings**' menu) for step size defaults.

Using **FUNC** then **TUNE** will load the last active frequency from the last mode.

To monitor any conventional frequency press **TUNE**. Enter the frequency and press **ENT**.

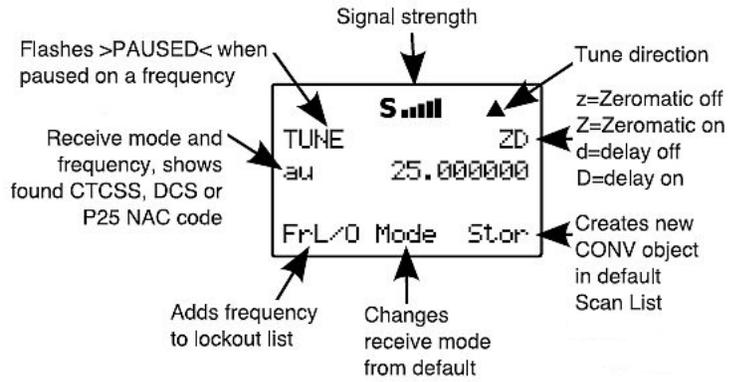
To monitor the currently displayed frequency press **FUNC** then **TUNE**.

By default, TUNE search is **PAUSED** when first started.

To start searching press **PSE** to release pause mode.

To change direction press **▼** or **▲**.

- To pause on a frequency press **PSE**.
- To lockout a frequency press **F1 (FrL/O)**.
- To unlock a frequency see [Unlocking Search Frequencies](#).
- To toggle the receive mode press **F2 (Mode)**.
- To store a frequency into the [Default Scan List](#) press **F3 (Stor)**.
- To toggle the [search delay](#) on or off press **FUNC** then **.** (DELAY).
- To toggle attenuation for the search on or off press **ATT**.
- To toggle [Zeromatic tuning](#) on or off press **FUNC** then **0**.



Tune Mode for Analyzing Trunked System Frequencies:

Pressing **FUNC TUNE** while scanning or paused on a trunked radio system will load the control channel frequency into TUNE mode if the control channel frequency is the last frequency that the scanner checked while scanning. Pressing **FUNC TUNE** while receiving a trunked radio TGRP will load the voice channel frequency into TUNE mode. Or, you can manually enter a control or voice channel by pressing **TUNE** then enter the frequency and press **SEL/ENT**.

Changing the [ADC Cal](#) (analog to digital conversion calibration?) setting (in the 'Expert Settings' menu) will show different information. **OFF** (the default setting) will show the receive mode and CTCSS/DCS/NAC code for conventional frequencies and the information in the charts below for trunking frequencies. **RSSI** will show digital received signal strength indication and analog voltage(?). **ZM** will show zeromatic tune thresholds(?). **DSP** will show [IMBE](#) detect (**XF**), P25 control channel detection (**HD2**), and NAC detection (**HD5**) for digital frequencies and CTCSS/DCS/NAC detect (**HD5**) for conventional frequencies.

Motorola P25 9600 baud Control Channel

Primary Display (LCD BlinkOn)			Secondary Display (LCD BlinkOff)		
system type P25	system type P25:	NAC nnn	system type P25	control channel ccc.cccc	
system ID Sy:sss	RFSS ID (Zone) Rrrr	site number Sttt	decoding quality qq%	NAC Nnnn	WACN Address W:wwwww
NAC=Network Access Code		RFSS=Radio Frequency Sub System	WACN=Wide Area Communication Network		

Motorola 3600 baud Control Channel

Primary Display (LCD BlinkOn)		Secondary Display (LCD BlinkOff)		
system type M36	control channel ccc.cccc	system type M36	control channel ccc.cccc	
tone? CT:cc.ccc		decoding quality qq%	system ID SID:ssss	site number Sttt

EDACS (Wideband) 9600 baud Control Channel

Display			
system type EDW (wideband) or EDN (narrowband)	control channel ccc.cccc		
decoding quality qq%	? Cnn	site number S:nn	site type h/H/s/S/a/A

h=not home site H=is home site
s=not SCAT site S=is SCAT site
a=not aux site A=is aux site

LTR Home Repeater

Display		
LCN number Ch:nn	tuned frequency ccc.cccc	
home repeater # HR:hh	area-home repeater-ID A-HH-GGG	site number S:nn/MoveHR

Motorola Analog Voice Channel

Display	
VC:lsTGID nnnnn	voice channel ccc.cccc

lsTGID is the decoded talkgroup ID data from the lowspeed data stream. Note that the analog lowspeed data protocol does not provide error correction and some false "VC: lsTGID" readings should be expected.



Analyze Option



Analyze Mode
Motorola P25 System

Analyze Mode is very similar to Tune Mode for trunking frequencies. The information is much the same as TUNE mode. There are two ways to get to analyze mode:

To analyze the trunked system for a talkgroup in the display, press **F2 (TSYS)** then **F3 (Analyze)**.

Or, press **PGM** then **F2 (EDIT)**. Press **▶** until **TSYS** is above softkey **F3** then press **F3**. Press **▼** or **▲** to select the system you want to analyze and press **MAN**. Press **F3 (Analyze)**.

Then press **▼** or **▲** until you here an active control channel and see information on the bottom line of the display.

Here is some fun and free software for analyzing trunked systems: [Pro96COM](#), [Unitrunker](#), [TrunkMON](#).

Dedicated Searches

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[Public Safety, Air, or Ham Search](#)

[Marine, CB, or FRS/GRMS/MURS Search](#)

[Rail Search](#)

[Signal Stalker/Spectrum Sweeper Search](#)

[Public Safety, Air, and Ham Search Group Charts](#)

[Marine, CB, and FRS/GRMS/MURS Search Channels](#)

[Limit Search](#)

[Unlocking Search Frequencies](#)

[Zeromatic Tuning](#)

Public Safety, Air, or Ham Search

The scanner's dedicated Service search allows you to search commonly used public safety frequencies, civilian and military air frequencies, and amateur radio frequencies. Programming your [Service Search as an object](#) gives you more options for the search (delay time, LED mode/color/latch, alarm, etc.). You could then use the search in Manual mode. This will also allow you to program and search more than one service search at a time by assigning them to one (or more) of the 22 Scan Lists.

To **Start a Dedicated Public Safety, Air, or Ham Search** press **SRCH** until **Srch PubSaftey**, **Aircraft**, or **Ham** appears on the top line.

To **change direction or resume searching** press **▼** or **▲**.

To **toggle groups on or off** press the number key assigned to the group.

To **pause on a frequency** press **PSE**.

To **lockout a frequency** press **F1 (FrL/O)**.

To **unlock a frequency** see [Unlocking Search Frequencies](#).

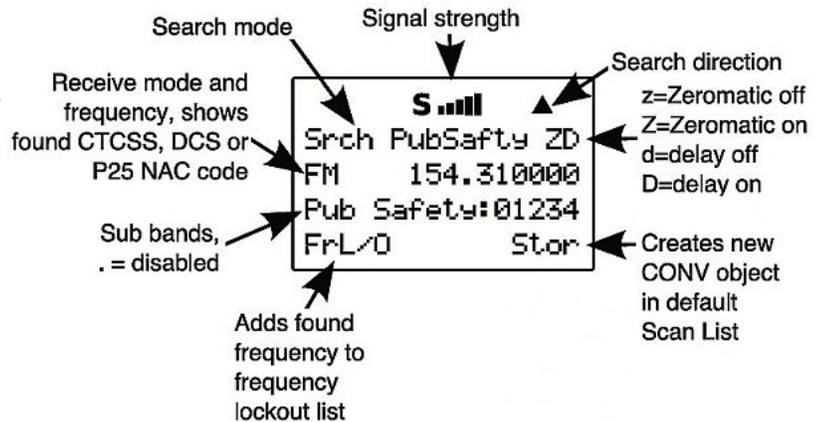
To **toggle the receive mode** press **F2 (Mode)**.

To **store a frequency** into the [Default Scan List](#) press **F3 (Stor)**.

To **toggle the search delay on or off** press **FUNC** then **.** (DELAY).

To **toggle attenuation for the search on or off** press **ATT**.

To **toggle Zeromatic tuning on or off** press **FUNC** then **0**.



Public Safety, Air, and Ham Search Group Charts (*=Canada Bandplan)

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Public Safety Groups					Aircraft Groups						
Group	Band	Frequencies	Step (kHz)	Mode (fixed)	Group	Band	Frequencies	Step (kHz)	Mode (defa)		
0	Public Safety	33.420-33.980	10	FM	0	Navigation	108-118	8.33	AM		
		37.020-37.420			1	Civilian Air	118-137				
		39.020-39.980			2	Military, Government	138-143.9875 (143.985)			12.5 (*5)	AM
		42.020-42.940					148-150.7875 (150.785)			12.5 (*5)	FM
		44.620-46.500					3			Commercial/Military Air	225-380
151.820-151.940	1	Public Safety	7.5 (*5)	FM	Military Trunked	380-400	12.5	FM			
153.770-154.950					Amateur Groups						
155.010-156.210					Group	Band	Frequencies	Step (kHz)	Mode (defa)		
158.730-159.210					0	10m	28-29.700	5	AM		
166.250, 170.150					1	6m	50-54	5	FM		
2	Public Safety	453.0375-453.9625	6.25 (*12.5)	FM	2	2m	144-148	5	FM		
		458.0375-458.9625			3	1.25m	222-225	5	FM		
		460.0125-460.6375			4	70cm	420-450	5 (*12.5)	FM		
		462.550-462.725			5	33cm	902-928	12.5	FM		
		465.0125-465.6375			6	23cm	1240-1300	6.25	FM		
467.5625-467.7125											
3	Trunked Public Safety	764-766.996875	3.125	FM							
		769-775.996875									
		794-796.996875									
4	Trunked Public Safety	851.0125-860.9875	12.5	FM							
		866.0125-868.9875									

Marine, CB, or FRS/GRMS/MURS Search

[Contents](#)

The CB, Marine, and FRS/GMRS/MURS bands are actually frequencies pre-programmed into special channels. You are not searching from a lower frequency to a higher frequency. There are 40 CB channels, 60 Marine channels, and 34 FRS/GMRS/MURS channels. Programming your CB, Marine, or FRS/GMRS/MURS search [as an object](#) gives you more options for the search (delay time, LED mode/color/latch, alarm, etc.). You could then use the search in Manual mode. This will also allow you to program and search more than one service search at a time by assigning them to one (or more) of the 22 Scan Lists.

To **Start a Dedicated CB, Marine, or FRS/GMRS/MURS Search** press **SRCH** until **Srch CB**, **Marine**, or **F/G/MURS** appears on the top line.

To **change direction or resume searching** press **▼** or **▲**.

To **pause on a channel** press **PSE**.

To view all channels press **F2** until (ALL-[uppercase]) appears.

To view just unlocked channels press **F2** until (all-[lowercase]) appears.

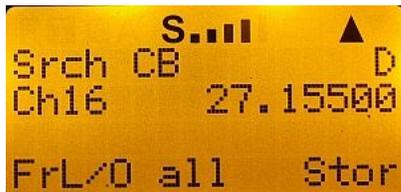
To lockout a channel press **F1** (FrL/O).

To unlock a channel press **F2** until (ALL)(uppercase) appears. Press ▼ or ▲ to locate the locked out channel ('L' in front of channel) and press L/OUT to unlock.

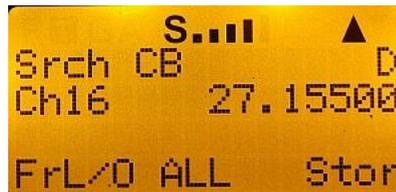
To store a channel into the [Default Scan List](#) press **F3** (Stor).

To toggle the [search delay](#) on or off press **FUNC** then . (DELAY).

To toggle attenuation for the search on or off press **ATT**.



CB Search With Locked Out Channels Invisible



CB Search With All Channels Visible

Marine, CB, and FRS/GRMS/MURS Search Channel Charts

[Contents](#)

Marine band Receive mode: FM								CB band Receive mode: AM				FRS/GMRS/MURS Receive mode: FM			
Ch.	Frequency	Ch.	Frequency	Ch.	Frequency	Ch.	Frequency	Ch.	Frequency	Ch.	Frequency	Ch.	Frequency	Ch.	Frequency
1	156.050	19	156.950	28	162.000	78	156.925	1	26.965	21	27.215	1	462.5625	18	462.625
5	156.250	20	157.000	63	156.175	79	156.975	2	26.975	22	27.225	2	462.5875	19	462.650
6	156.300	20	161.600	64	156.225	80	157.025	3	26.985	23	27.255	3	462.6125	20	462.675
7	156.350	21	157.050	64	160.825	81	157.075	4	27.005	24	27.235	4	462.6375	21	462.700
8	156.400	22	157.100	65	156.275	82	157.125	5	27.015	25	27.245	5	462.6625	22	462.725
9	156.450	23	157.150	66	156.325	83	157.175	6	27.025	26	27.265	6	462.6875	23	151.820
10	156.500	24	157.200	67	156.375	84	157.225	7	27.035	27	27.275	7	462.7125	24	151.880
11	156.550	24	161.800	68	156.425	84	161.825	8	27.055	28	27.285	8	467.5625	25	151.940
12	156.600	25	157.250	69	156.475	85	157.275	9	27.065	29	27.295	9	467.5875	26	154.570
13	156.650	25	161.850	70	156.525	85	161.875	10	27.075	30	27.305	10	467.6125	27	154.600
14	156.700	26	157.300	71	156.575	86	157.325	11	27.085	31	27.315	11	467.6375	28	151.625
15	156.750	26	161.900	72	156.625	86	161.925	12	27.105	32	27.325	12	467.6625	29	464.500
16	156.800	27	157.350	73	156.675	87	157.375	13	27.115	33	27.335	13	467.6875	30	464.550
17	156.850	27	161.950	74	156.725	87	161.975	14	27.125	34	27.345	14	467.7125	31	467.850
18	156.900	28	157.400	77	156.875	88	157.425	15	27.135	35	27.355	15	462.550	32	467.875
								16	27.155	36	27.365	16	462.575	33	467.900
								17	27.165	37	27.375	17	462.600	34	467.925
								18	27.175	38	27.385				
								19	27.185	39	27.395				
								20	27.205	40	27.405				

Rail Search

[Contents](#)

The Railroad band searches all frequencies between 159.810 and 161.565. Most rail VHF frequencies still use the 15 kHz spacing between designated rail channels. Programming your [Rail Search as an object](#) gives you more options for the search (delay time, LED mode/color/latch, alarm, etc.). You could then use the search in Manual mode. This will also allow you to program and search more than one service search at a time by assigning them to one (or more) of the 22 Scan Lists.

To Start a Dedicated Rail Search press **SRCH** until **Srch Railroad** appears on the top line.

To change direction or resume searching press ▼ or ▲.

To pause on a frequency press **PSE**.

To lockout a frequency press **F1** (FrL/O).

To unlock a frequency see [Unlocking Search Frequencies](#).

To store a channel into the [Default Scan List](#) press **F3** (Stor).

To toggle the [search delay](#) on or off press **FUNC** then . (DELAY).

To toggle attenuation for the search on or off press **ATT**.

To toggle [Zeromatic tuning](#) on or off press **FUNC** then 0.

Railroad Receive mode: FM (*=Canada Bandplan)	
Frequency	Step (kHz)
159.810-161.565	7.5 (*5)

Limit Search

[Contents](#)

The scanner's dedicated limit search mode allows you to program one limit search of upper and lower frequencies. Programming your [Limit Search as an object](#) gives you more options for the search (delay time, LED mode/color/latch, alarm, etc.). You could then use the search in Manual mode. This will also allow you to program and search more than one range at a time by assigning them to one (or more) of the 22 Scan Lists.

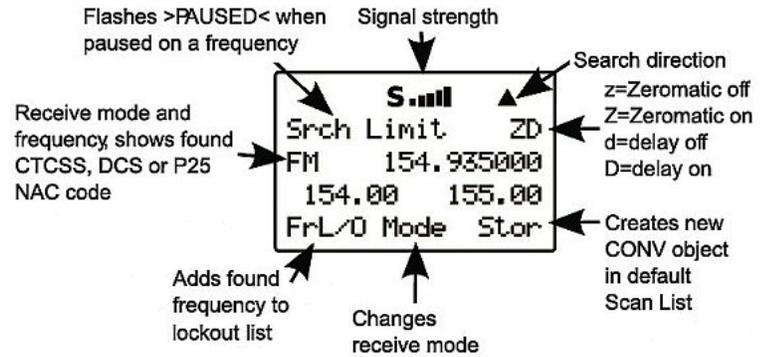
See also [BandPlan](#) and [FlexStep](#) settings (in the 'Expert Settings' menu) for step size defaults.

To Start a Dedicated Limit Search press **SRCH** until **Srch Limit** appears on the top line.

Press **F1** (Lmts) to set the lower and upper frequencies.

(Press **FUNC** then **F1** during transmissions to override FrL/O).

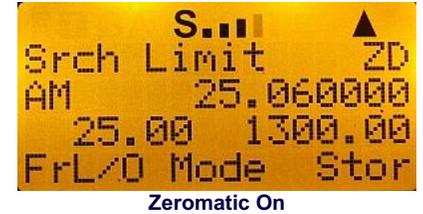
Enter the lower frequency and press **ENT**.
 Enter the upper frequency and press **ENT**.
 Press **F1 (Save)**.
 To change direction or resume searching press **▼** or **▲**.
 To pause on a frequency press **PSE**.
 To lockout a frequency press **F1 (FrL/O)**.
 To unlock a frequency see [Unlocking Search Frequencies](#).
 To toggle the receive mode press **F2 (Mode)**.
 To store a frequency into the [Default Scan List](#) press **F3 (Stor)**.
 To toggle the [search delay](#) on or off press **FUNC** then **.** (DELAY).
 To toggle attenuation for the search on or off press **ATT**.
 To toggle [Zeromatic tuning](#) on or off press **FUNC** then **0**.



Zeromatic Tuning

Zeromatic tuning is a feature that enhances the scanner's ability to lock on to the actual center frequency of a search hit instead of an adjacent frequency. This option is available for all Limit, Service, and Stalker/Sweeper search objects and dedicated searches except CB, Marine, and F/G/MURS.

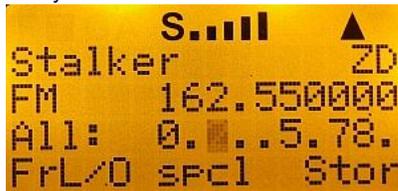
Press **FUNC** then **0** to toggle **On** (uppercase **Z** in display) or **Off** (lowercase **z** in display) while searching.



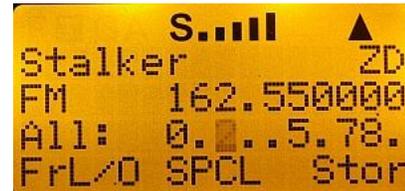
Signal Stalker/Spectrum Sweeper Search

[Contents](#)

Your scanner's Stalker/Sweeper feature provides a powerful new tool for you to rapidly detect, monitor, and store frequencies from *nearby* radio transmissions. The Stalker/Sweeper feature is more sensitive than portable frequency counters and will detect transmissions at a greater distance. Stalker/Sweeper functions by rapidly searching through the RF spectrum in 1 MHz segments. If RF signal energy is detected in a 1 MHz segment, the scanner will search through the 1MHz segment in finer steps until the source of the RF signal energy is found. The Stalker/Sweeper feature is similar in functionality to portable frequency counters that cost much more than your scanner, but provides many advantages over typical portable frequency counters. For example: The Stalker/Sweeper allows you to search the entire range of your scanner's design frequencies, or you can specify just those frequency ranges that you wish to search.



Stalker/Sweeper Search



Special Stalker/Sweeper Search

Special Stalker/Sweeper

If a 1 MHz sweep indicates that activity is present, when set to 'On' (**F2-SPCL**), *Special* Stalker/Sweeper searches the whole 1 MHz range to find the source. If you lockout 5 frequencies within a 1 MHz segment, the scanner will skip that entire segment in subsequent searches. See [SpclStalk\(Sweep\)Lmt](#) (in the '**Expert Settings**' menu) to change the (default 5) number of frequencies within a 1 MHz segment.

You can press **F1 (FrL/O)** when the Stalker/Sweeper stops on these undesired transmissions to prevent the Stalker/Sweeper from stopping on them in future searches, however, the Stalker/Sweeper will still see their signal energy when searching through the 1 MHz segment. This will cause the Stalker/Sweeper to execute another fine step search of the 1 MHz segment. If you have locked out the undesired transmissions, the Stalker/Sweeper will not stop on them again but the overall search performance of the Stalker/Sweeper will be slowed accordingly.

Programming your [Stalker/Sweeper Search as an object](#) gives you more options for the search (delay time, LED mode/color/latch, alarm, etc.). This will also allow you to program different Stalker/Sweeper objects with different settings and assign them to one (or more) of the 22 Scan Lists.

To Start a Dedicated Sweeper/Stalker Search press **FUNC** then **SCAN** **▲**.

To switch between All bands or just Public Safety Bands. Press **F1 (Band)**.

(Press **FUNC** then **F1** during transmissions to override **FrL/O**).

To toggle bands on or off press the **number key** assigned to the band.

To change direction or resume searching press **▼** or **▲**.

To pause on a frequency press **PSE**.

To lockout a frequency press **F1 (FrL/O)**.

To unlock a frequency see [Unlocking Search Frequencies](#).

To turn 'Special Stalker/Sweeper on or off press **F2 (spcl)**. **SPCL** (uppercase) indicates 'Special' is active.

To store a frequency into the [Default Scan List](#) press **F3 (Stor)**.

To toggle the search delay on or off press **FUNC** then **.** (DELAY).

To toggle attenuation for all search bands on or off press **ATT**.

To toggle Zeromatic tuning on or off press **FUNC** then **0**.

To exit press **SCAN**.

Notes: See also [BandPlan](#) and [FlexStep](#) settings (in the '**Expert Settings**' menu) for step size defaults.

Priority mode is not available while using Signal Stalker/Spectrum Sweeper.

All Stalker/Sweeper Bands			
Key	Band	Frequencies	Mode
0	CB, 10m/6m Ham	25-54	Auto
1	VHF Air	108-137	Auto
2	2m Ham, PS, Rail	137-174	Auto
3	Commercial Air, 1.25m Amateur	216-300	Auto
4	Military Air	300-406	Auto
5	70cm Ham, PS	406-470	Auto
6	UHF TV	470-512	Auto
7	Trunked Public Safety	764-797	Auto
8	Trunked Public Safety	806-869	Auto
9	33/23cm Ham	894-960,1240-1300	Auto
Public Safety Bands			
Key	Band	Frequencies	Mode
0	Public Safety	33.400-46.500	Auto
1	Public Safety	151-170	Auto
2	Public Safety	453-467	Auto
3	Trunked Public Safety	764-797	Auto
4	Trunked Public Safety	806-869	Auto

Unlocking Search Frequencies

To unlock a frequency press **PGM** then **F3 (GLOB)** to enter the 'Global Settings' Menu.

Press **▼** to locate **SRCH L/Outs** then press **SEL/ENT** to view the lockout list.

Press **▼** to locate the frequency and press **F3 (Del)** to unlock (or *press and hold* to delete multiple frequencies).

To unlock all frequencies press **FUNC** then **F3 (Del)** while in the lockout menu.

Press **F1 (Save)** to exit.

Using Weather Modes

[Contents](#)

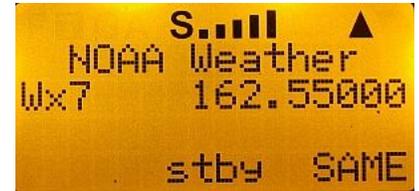
There are three weather modes you can use with these scanners; Weather Radio, Weather Priority, and SAME Standby.

Weather Radio

Weather radio mode allows you to receive weather broadcasts from your local weather service. While in Weather Radio Mode, your scanner will alert on SAME messages that match the SAME location codes you have entered or all SAME messages if you have not entered any SAME location codes.

To hear your local weather channel press **WX**. If it is a weak signal, press **▼** or **▲** to find a stronger channel.

Press **SCAN** to exit.



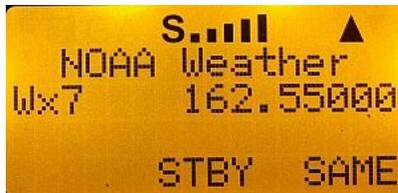
Weather Scan Mode

Weather Priority

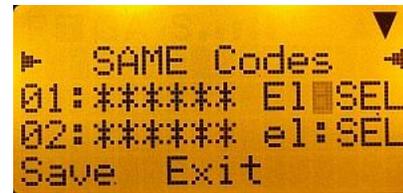
Weather Priority mode monitors the current weather frequency periodically (see [Weather settings](#) in the 'Expert Settings' menu) while scanning to see if the All Hazards 1050 Hz Warning Alert Tone (WAT) is present. If so, the scanner will sound an alarm and tune to the specified weather frequency to monitor the alert.

To toggle Weather Priority Mode press **WX** then **PRI**. You will see **-P** next to the weather channel number. Press

SCAN to exit.



SAME Standby Mode



SAME Program Menu

SAME Standby

SAME Standby Mode monitors the specified weather frequency *silently*, waiting to receive a Specific Area Message Encoding (SAME) alert that corresponds with up to 10 SAME location code(s) and event code(s) that you have programmed. If there is a match between a sent SAME location code/event code and one that you have programmed, the scanner will sound an alarm, display the alert type, and monitor the alert. To activate SAME Standby Mode for your area, you should provide at least one SAME location code for your city, county or state. You may wish to enter additional codes for surrounding areas so that you can receive advance warning of adverse or dangerous weather that may be headed in your direction. By default, SAME mode will alert on any SAME message received if no SAME location codes are programmed.

The NWS has divided the United States into regions by state and county (or parish, where applicable) then assigned a 6-digit FIPS code to identify each county or parish. For example, the code for Tarrant County, Texas, is 048439. The first digit in a FIPS code identifies the county subdivision, the next two digits identify the state, and the last three digits identify the county or parish. Most FIPS codes begin with 0, which means the code represents an entire county. The NWS, however, plans to eventually subdivide some large counties. When that happens, each subdivision will be assigned a digit from 1-9, resulting in codes such as 148439, 248439, and so on.

FIPS (SAME) codes are in the format nSSCCC:

n: A special subcounty designator. For an entire county, use 0.

SS: The state code.

CCC: The county code.

These scanners also feature a SAME wildcard feature that allows you to set the radio to alarm on partial matches of the location code or all codes. Using the wildcard feature you can enter a SAME area code such as *48***. This tells the radio to alert on any SAME message with a location code that matches 48 for any county in Texas. Each SAME location and event code can be set to 'ON' (enabled) or 'OFF' and Lockout set to 'ON' or 'OFF'. The Lockout feature allows you to enter and lockout certain event codes like the weekly test event code and still here other event codes with one or more location codes. **Warning:** In case of a conflict (i.e., two identical codes and events are entered), and one is locked out, the *locked out entry will take precedence*. To obtain the FIPS (SAME) codes call the NWS toll free at 1-888-697-7263 (follow the instructions you hear) or see [FIP codes for the United States and its Possessions](#).

Event Codes

Event codes are just different types of warnings. These scanners will allow to program specific alert event codes or a wildcard code (that will receive any event) and/or lock them out so you can monitor just the events you want to hear. A list of event codes can be found [here](#).

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To Program SAME Codes and Event Codes press **WX**. Make sure you are receiving a strong weather channel.

Press **F3 (SAME)** then **▼** or **▲** to select a SAME location (1-10) and press **SEL/ENT**.

For the **Entry field** press **◀** or **▶** to select **On** or **Off** to enable or disable the location.

For the **Code field** enter the SAME code for the location or **F3 (Dfit)** for all locations or a wildcard location.

For the **Event field** enter the event code for the location or **F3 (Dfit)** for all events.

For the **Tag field** give the location a name. See [Enter text](#) or [Enter Qtext](#).

For the **Alarm field** press **◀** or **▶** to select the alarm type.

For the **Lockout field** press **◀** or **▶** to select **On** or **Off**

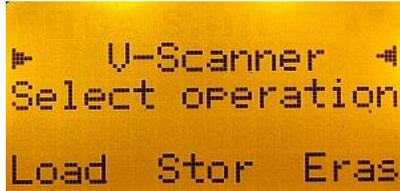
Press **F1 (Save)** to exit

Press **▼** or **▲** to select another SAME location (1-10) and repeat for each.

Press **F1 (Save)** again to exit back to weather mode.

To Toggle SAME Standby Mode On or Off press **F2 (stby)**. **STBY** (uppercase) indicates SAME Standby is active.

Using V-Scanner Folders



V-Scanner Menu



V-Scanner Selection

[Contents](#)

These scanners have two types of memory storage. Main memory and V-Scanner memory. Main memory is what you see and use when you turn on the scanner. V-Scanner memory is used to store complete copies of your scanner's main memory including objects, 'Global Settings' and dedicated search configurations. The V-Scanner menu will allow you to store, load, and name up to 21 'Main Memories'. Handy if you have a lot of systems for several different areas. This can also be useful if you want to store or 'backup' your current memory 'as is', then try different settings for improvement. If the settings don't work, you can reload your previous memory.

There is a CD that comes the 106/197 and PSR models to re-install the factory V-Scanner folders if you happen to delete them.

Note: The scanner won't let you load/store V-Folders when the low battery icon is in the display.

To Store the Main Memory press **FUNC** then **PGM**. At '**Select Operation**', press **F2 (Stor)**. Use **▼** to select the V-Folder (00-20) you want to store the main memory into.

Press **F3 (Stor)**. If the selected V-Scanner folder already contains a 'main memory' '**Really overwrite V-Folder data?**' appears then press **F1 (Yes)** to store.

The scanner then allows you to name the selected folder (see [Enter text](#) or [Qtext](#)) or to keep the existing folder name. Press **F1 (OK)** to finish the operation.

Press **F1 (Cancel)** to exit. Press **SCAN** to start scanning.

To Load a V-Scanner Folder press **FUNC** then **PGM**. At '**Select Operation**', press **F1 (Load)**. Use **▼** to select the V-Folder (00-20) you want to load into the main memory.

Press **F3 (Load)**. '**Really overwrite main memory?**' appears then press **F1 (Yes)** to load. Press **SCAN** to reboot the scanner and start scanning.

To Erase a V-Scanner Folder press **FUNC** then **PGM**. At '**Select Operation**', press **F3 (Eras)**. Use **▼** to select the V-Folder (00-20) you want to erase. Press **F3 (Eras)**. '**Really erase V-Folder data?**' appears then press **F1 (Yes)** to erase.

Press **F1 (Cancel)** to exit. Press **SCAN** to start scanning.

Preprogrammed V-Scanner Folders (not with the Pro-651/652)

See the V-Scanner guide included with each scanner for more detailed system information.

VS-0 -empty-	VS-7 Washington, Oregon, Nevada and Utah	VS-14 Michigan, Indiana
VS-1 Washington, DC, Maryland, Virginia	VS-8 Arizona, New Mexico, Colorado, Kansas, Oklahoma	VS-15 North Ohio, Pennsylvania
VS-2 North Florida	VS-9 North Texas	VS-16 South Ohio
VS-3 South Florida	VS-10 South Texas, Louisiana	VS-17 Delaware, Maryland, New Jersey Shores
VS-4 Virginia	VS-11 Mississippi, Alabama, Arkansas	VS-18 North New Jersey, New York
VS-5 California Desert	VS-12 Tennessee, Georgia, Missouri	VS-19 Kentucky, North Carolina, South Carolina
VS-6 California	VS-13 Wisconsin, Illinois	VS-20 Connecticut, Massachusetts, New Hampshire, Maine

Expert Settings Menu

The 'Expert Settings' menu allows you to adjust some of the more advanced features of these scanners. The default settings will work fine in most cases but you will probably want to fine tune the radio to suit your individual needs.

Press **PGM** then **FUNC** then **F3 (GLOB)**. Use **▼** or **▲** to select each option.

See [Navigating Menus](#) if you are new to the radio.

Main menu changes do not take effect until the menu is saved-**F1 (Save)**.

If you forget to save any changes, you will see '**Unsaved Changes! Go Back?**'.

Press **F1 (Yes)** to go back or **F3 (No)** to exit without saving.

All settings in menu order

Max Tunes	WX Lstn Time	ADC Cal	HD2 Holdoff	EDACS UnMute
SQ Wait 1	Stalk(Sweep)ScanSQ2	RSSI Sig Cal	96CC HD2 TO	EDACS ET HO
SQ Wait 2	Stalk(Sweep)SrChSQ2	Bat Icon Cal	96VC SQ TO	Trunking Ch#
RF SQ Fade	Stalk(Sweep)SrChSQ1	Zeromatc Cal	96VC XF TO	Show RadioID
DG Int Prime	Stalk(Sweep)AMDelay	ZM Delay	HD2 Qual DG	RadioIDAlert
Noise Thresh	Stalk(Sweep)FMDelay	ACSQ Srclnt	SubaudDelay	Bandplan
WX Check Int	SpclStalk(Sweep)Lmt	ACSQ Pollnt	M36 ET Patt	CCDump
WX 1050Hz Th	SearchTunes	HD5 Fade	EndtoneMot	DSPDump
WX Alrm Time	FlexStep	HD2 Qualify	EndtoneEDACS	

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Settings by Type

[General Tuning](#)[P25 Trunking](#)[Motorola Trunking](#)[Stalker/Sweeper Settings](#)[Weather Settings](#)[Digital Tuning](#)[CTCSS/DCS/NAC](#)[EDACS Trunking](#)[Zeromatic Settings](#)[Misc Settings](#)

General Tuning

SQ Wait 1 The amount of time to wait for a signal on a frequency while scanning (scan speed) in the *same band*. The lower the value the faster the scan speed, the higher the value, the slower the scan speed. There is probably a possibility of setting the value too low and the scanner would not stop on active frequencies. These values also impact searching and tuning ('Tune' search). [1]

Default Value: 10 (10 ms). **Values:** Enter 1-200 (1 - 200 ms). **Suggested value 5-7.**

Menu Help Text: Squelch wait time, same band

Win500 Name - Extended Settings>General Tuning>
In-band [SQ Timeout](#)

PSREdit Name - Weather/Advanced Configuration>Expert Settings>
[Squelch Time Same Band](#)

SQ Wait 2 The amount of time to wait for a signal on a frequency while scanning (scan speed) in a *different band*. The lower the value the faster the scan speed, the higher the value, the slower the scan speed. There is probably a possibility of setting the value too low and the scanner would not stop on active frequencies. These values also impact searching and tuning. [1]

Default Value: 15 (15 ms). **Values:** Enter 1-200 (1 - 200 ms). **Suggested value 10-12.**

Menu Help Text: Squelch wait time, new band

Win500 Name - Extended Settings>General Tuning>
Out-of-band [SQ Timeout](#)

PSREdit Name - Weather/Advanced Configuration>Expert Settings>
[Squelch Time Different Band](#)

RF SQ Fade Length of time to wait before closing the squelch after lost signal (squelch tail).

Default Value: 10 (100 ms). **Values:** Enter 0-99 (0 - 990 ms).

Menu Help Text: RF SQ fade delay

Win500 Name - Extended Settings>General Tuning>
[RF SQ Fade Timeout](#)

PSREdit Name - Weather/Advanced Configuration>Expert Settings>
[RF Fade Time](#)

SearchTunes Maximum number of frequencies to check in each limit, service, or stalker/sweeper search *object* while scanning.

Default Value: 0 (entire range). **Values:** Enter 0-9999 tunes (frequencies).

Menu Help Text: Max search tunes per scan loop 0=entire range

Win500 Name - Extended Settings>General Tuning>
[SRCH tunes in SCAN](#)

PSREdit Name - Weather/Advanced Configuration>Sweeper/Search Options>
[Max Search Tunes per Scan Cycle](#)

Digital Tuning

DG Int Prime Controls how long the scanner waits to automatically detect digital (P25 [CAI](#)) transmissions, when the type of transmission isn't known/expected ahead of time. [2]

Default Value: 60 (600 ms). **Values:** Enter 1-100 (10 - 1000 ms). **Suggested value 30.**

Menu Help Text: Preselect [DG](#) audio

Win500 Name - Extended Settings>Digital>
[Digital detect timeout](#)

PSREdit Name - Weather/Advanced Configuration>Expert Settings>
[Digital Detect Time](#)

Noise Thresh Sounds like the number of noisy 'bits' that the scanner will allow prior to retuning or adjusting with the [DSP](#). External noise appearing at the front end of a receiver, plus the noise added by the receiver itself, determines a noise threshold that has to be exceeded by the minimum discernible signal. [9]

Default Value: 20. **Values:** Enter 1-128. **Suggested value 45-50.**

Menu Help Text: Noise threshold value for DSP

Win500 Name - Extended Settings>Digital>
[Noise threshold](#)

PSREdit Name - Weather/Advanced Configuration>Expert Settings>
[Noise Threshold](#)

P25 Trunking

[Contents](#)

96CC HD2 TO Length of time to wait for P25 control channel detection timeout.

Default Value: 30 (300 ms). **Values:** Enter 10-250 (100 - 2500 ms).

Menu Help Text: 9600CC SQ to HD2 timeout

Win500 Name - Extended Settings>P25 Trunking>
[CC detect timeout](#)

PSREdit Name - Weather/Advanced Configuration>P25 Settings>
[CC HD2 Timeout](#)

96VC SQ TO Length of time to wait for P25 voice channel [RF](#) squelch timeout. Go lower to release squelch sooner, go up to extend squelch longer. [11]

Default Value: 50 (500 ms). **Values:** Enter 10-250 (100 - 2500 ms).

Menu Help Text: 9600VC RF SQ timeout

Win500 Name - Extended Settings>P25 Trunking>
[VC RF SQ timeout](#)

PSREdit Name - Weather/Advanced Configuration>P25 Settings>
[VC SQ Timeout](#)

96VC XF TO Length of time to wait for P25 voice channel digital [IMBE](#) timeout.

Default Value: 100 (1000 ms). **Values:** Enter 10-250 (100 - 2500 ms).

Menu Help Text: 9600VC [SQ](#) to XF timeout

Win500 Name - Extended Settings>P25 Trunking>
[VC Digital timeout](#)

PSREdit Name - Weather/Advanced Configuration>P25 Settings>
[VC XF Timeout](#)

HD2 Qual DG Length of time to check for a P25 control channel before unmuting in '[Analyze](#)'.

Default Value: 100 (1000 ms). **Values:** Enter 10-250 (100 - 2500 ms).

Menu Help Text: [HD2](#) qual time to unmute 96CC

Win500 Name - Extended Settings>P25 Trunking>
[Qualify CC in analyze](#)

PSREdit Name - Weather/Advanced Configuration>HD2 Settings>
[Qualify Time \(Digital\)](#)

CTCSS/DCS/NAC

ACSQ SrcInt Length of time to wait for a CTCSS/DCS/[NAC](#) signal in [auto squelch search](#).

Default Value 500 (500 ms). **Values:** Enter 10-2000 (10 - 2000 ms).

Menu Help Text: Wait for [HD5](#) sig in auto [CSQ](#) srch

Win500 Name - Extended Settings>CTCSS/DCS/NAC>
[Search Interval](#)

PSREdit Name - Weather/Advanced Configuration>HD5 Settings>
[Search Delay](#)

ACSQ PollInt The interval of time to check for a CTCSS/DCS/NAC signal.

Default Value 100 (100 ms). Values: Enter 10-1000 (10 - 1000 ms).	Menu Help Text: Interval to poll for CSQ value
Win500 Name - Extended Settings>CTCSS/DCS/NAC> Query Interval	PSREdit Name - Weather/Advanced Configuration>HD5 Settings> Query Interval

HD5 Fade Length of time to wait after losing a CTCSS/DCS/NAC signal. If the scanner loses programmed CTCSS, DCS, or NAC for the time specified in that parameter, it will mute audio. Increasing the time may help with the above-described behavior under weak signal or overload conditions. [12]. See also [13].

Default Value 2000 (2000 ms). Values: Enter 10-2500 (10 - 2500 ms).	Menu Help Text: CSQ fade delay
Win500 Name - Extended Settings>CTCSS/DCS/NAC> Fade Timeout	PSREdit Name - Weather/Advanced Configuration>HD5 Settings> Fade Delay

HD2 Qualify Length of time to check to detect an end of signal turn off code command. See also [13].

Default Value 75 (75 ms). Values: Enter 1-1000 (1 - 1000 ms).	Menu Help Text: CSQ end detect threshold
Win500 Name - Extended Settings>CTCSS/DCS/NAC> End detect qualify	PSREdit Name - Weather/Advanced Configuration>HD2 Settings> Qualify Time (Analog)

HD2 Holdoff Length of time to mute a signal after an end of signal turn off code command.

Default Value 500 (500 ms). Values: Enter 10-1000 (10 - 1000 ms).	Menu Help Text: CSQ post-end wait time
Win500 Name - Extended Settings>CTCSS/DCS/NAC> Delay after end	PSREdit Name - Weather/Advanced Configuration>HD2 Settings> Mute Time

Motorola Trunking

[Contents](#)

SubaudDelay Length of time to wait to check for Motorola subaudible data to decode.

Default Value 150 (150 ms). Values: Enter 0-65535 (0 - 65535 ms).	Menu Help Text: Delay before we start subaudible decode
Win500 Name - Extended Settings>Motorola Trunking> Subaudible start delay	PSREdit Name - Weather/Advanced Configuration>Motorola Sub-Audible Settings> Delay Time

M36 ET Patt The Motorola 3600 end tone 16-bit pattern to detect an end of signal command.

Default Value 2B2B. Values: Enter 0x0000-0xFFFF.	Menu Help Text: Mot3600 Endtone 16-bit pattern to detect
Win500 Name - Extended Settings>Motorola Trunking> Endtone pattern	PSREdit Name - Weather/Advanced Configuration>Motorola Sub-Audible Settings> End Tone Pattern

EndtoneMot The Motorola 3600 end tone number of bits required to mute at end of signal.

Default Value 80. Values: Enter 0-250.	Menu Help Text: # of >baud bits to trig 3600CC analog end
Win500 Name - Extended Settings>Motorola Trunking> Endtone threshold	PSREdit Name - Weather/Advanced Configuration>Motorola Sub-Audible Settings> End Tone Threshold

EDACS Trunking - these settings control how the scanner behaves after it has already recognized a "call grant" message. [2]

EndtoneEDACS While on a "voice frequency", qualifying time in bits for the "endtone" to indicate end of transmission. [2]

Default Value 10. Values: Enter 0-250.	Menu Help Text: # of >baud bits to trig 4800CC analog end
Win500 Name - Extended Settings>EDACS Trunking> Endtone threshold	PSREdit Name - Weather/Advanced Configuration>EDACS Settings> End Tone Threshold

EDACS UnMute After tuning to a 'voice frequency', a delay before unmuting audio. [2]

Default Value 18 (180 ms). Values: Enter 0-100 (0 - 1000 ms).	Menu Help Text: EDACS unmute delay
Win500 Name - Extended Settings>EDACS Trunking> GCG unmute delay	PSREdit Name - Weather/Advanced Configuration>EDACS Settings> GCG Unmute Delay

EDACS ET HO After returning to the [CC](#) from a "voice frequency", how long to ignore any calls on the same "voice frequency". [2]

Default Value 35 (350 ms). Values: Enter 0-100 (0 - 1000 ms).	Menu Help Text: EDACS post end-tone holdoff
Win500 Name - Extended Settings>EDACS Trunking> Endtone holdoff	PSREdit Name - Weather/Advanced Configuration>EDACS Settings> End Tone Holdoff

Signal Stalker/Spectrum Sweeper Settings

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Max Tunes This setting value appears to set the number of tunes (frequencies) prior to restart of new Stalker/Sweeper group. [3]

Default Value: 20 (frequencies). Values: Enter 1 to 1000 tunes (frequencies).	Menu Help Text: Max search tunes per scan loop
Win500 Name - Extended Settings> General Tuning> Max cached tunes	PSREdit Name - Weather/Advanced Configuration>Sweeper/Search Options> Resume Delay Time

Stalk(Sweep)ScanSQ2 Length of time to wait for a signal on a frequency during Stalker/Sweeper while *scanning* (large signal quality).

Default Value 5 (5 ms). Values: Enter 1-100 (1 - 100 ms).	Menu Help Text: Stalker/Sweeper scan large sig qual
Win500 Name Extended Settings>Spectrum Sweeper> Wide SQ timeout	PSREdit Name - Weather/Advanced Configuration>Sweeper/Search Options> Squelch Delay in Scan Mode

Stalk(Sweep)SrchSQ2 Length of time to wait for a signal on a frequency during Stalker/Sweeper while *searching* (large signal quality).

Default Value 5 (5 ms). Values: Enter 1-100 (1 - 100 ms).	Menu Help Text: Stalker/Sweeper search large sig qual
Win500 Name Extended Settings>Spectrum Sweeper> Narrow SQ timeout 2	PSREdit Name - Weather/Advanced Configuration>Sweeper/Search Options>

Squelch Delay #2 in Search Mode

Stalk(Sweep)SrchSQ1 Length of time to wait for a signal on a frequency during Stalker/Sweeper while *searching* (small signal quality).

Default Value 10 (10 ms). **Values:** Enter 1-100 (1 - 100 ms).

Menu Help Text: Stalker/Sweeper search small sig qual

Win500 Name Extended Settings>Spectrum Sweeper>
Narrow SQ timeout 1

PSREdit Name - Weather/Advanced Configuration>Sweeper/Search
Options>
Squelch Delay #1 in Search Mode

Stalk(Sweep)AMDelay Length of time to wait to unmute in AM mode during Stalker/Sweeper.

Default Value 150 (150 ms). **Values:** Enter 1-255 (1 - 255 ms).

Menu Help Text: Stalker/Sweeper unmute delay - AM mode

Win500 Name Extended Settings>Spectrum Sweeper>
AM unmute delay

PSREdit Name - Weather/Advanced Configuration>Sweeper/Search
Options>
Unmute Delay (AM Mode)

Stalk(Sweep)FMDelay Length of time to wait to unmute in FM mode during Stalker/Sweeper.

Default Value 50 (50 ms). **Values:** Enter 1-255 (1 - 255 ms).

Menu Help Text: Stalker/Sweeper unmute delay - FM mode

Win500 Name Extended Settings>Spectrum Sweeper>
FM unmute delay

PSREdit Name - Weather/Advanced Configuration>Sweeper/Search
Options>
Unmute Delay (FM Mode)

SpclStalk(Sweep)Lmt The maximum number of Special Stalker/Sweeper lockouts per range before skipping that range.

Default Value 5 (lockouts). **Values:** Enter 1-20 (lockouts).

Menu Help Text: Special Stalker/Sweeper lockout count before skip

Win500 Name Extended Settings>Spectrum Sweeper>
'Special' lockout limit

PSREdit Name - Weather/Advanced Configuration>Sweeper/Search
Options>
Max Lockouts Per Range in SPCL

Zeromatic Settings

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Zeromatic Cal Customize the zeromatic tune threshold values for 5kHz ranges and non-5kHz ranges (entrance low value and high value, exit low value and high value). See also [\[4\]](#).

Default Values: **Suggested Values:** [\[17\]](#) **Menu Help Text:** Zeromatic tune thresholds

5kHz In Lo-252	In Lo-210	5kHz In Lo-170	In Lo-170
5kHz In Hi-552	In Hi-594	5kHz In Hi-480	In Hi-480
5kHz Out Lo-210	Out Lo-174	5kHz Out Lo-150	Out Lo-150
5kHz Out Hi-594	Out Hi-633	5kHz Out Hi-530	Out Hi-530

Values:1-1023

Win500 Name - Extended Settings>
Zeromatic Thresholds

PSREdit Name - Weather/Advanced Configuration>
ZeroMatic Settings

ZM Delay Zeromatic check delay.

Default Value 5 (5 ms). **Values:** Enter 0-1000 (0 - 1000 ms).
Actually only able to enter values up to 100. [\[1\]](#)

Menu Help Text: Zeromatic check delay

Win500 Name - Extended Settings>
ZM Check delay

PSREdit Name - Weather/Advanced Configuration>ZeroMatic Setting>
Check Delay

Weather Settings

WX Check Int Interval of time to check for a weather alarm signal on a channel while scanning (WX Priority). See also [Priority Scanning](#).

Default Value 60 (6 seconds). **Values:** Enter 5-250 (.5 - 25 seconds).

Menu Help Text: Weather 1050 chk interval in SCAN and MAN modes

Win500 Name - Weather Settings>Weather Priority Settings>
Check interval

PSREdit Name - Weather/Advanced Configuration>Timer Settings>
1050 Hz Tone Detect Threshold

WX 1050Hz Th Length of time to wait on the weather frequency to check for the alarm signal.

Default Value 20 (200 ms). **Values:** Enter 7-250 (70 - 2500 ms).

Menu Help Text: Weather 1050Hz qualify time

Win500 Name - Weather Settings>Weather Priority Settings>
1050Hz qualifier

PSREdit Name - Weather/Advanced Configuration>Timer Settings>
Timeout

WX Alrm Time Length of time to wait before unmuting the weather frequency after an alarm.

Default Value 0 (0 seconds). **Values:** Enter 0-600 (0 - 600 seconds).

Menu Help Text: WX SAME alert time to unmute 0=unmute @1050

Win500 Name - Weather Settings>Weather Priority Settings>
Alarm timeout

PSREdit Name - Weather/Advanced Configuration>Timer Settings>
Alarm Settings: Length

WX Lstn Time Length of time to listen to the weather frequency after an alarm unmuting the radio.

Default Value 90 (90 seconds). **Values:** Enter 30-999 (30 - 999 seconds).

Menu Help Text: WX Listen Time Auto-remute time after unmute

Win500 Name - Weather Settings>Weather Priority Settings>
Listen time

PSREdit Name - Weather/Advanced Configuration>Timer Settings>
Listen

Misc Settings

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FlexStep When set to 'On' allows you to enter a frequency down to any 1250 Hz (1.25 kHz - .00125) step (except in the civil air band 108-136 where the step size is fixed at 8.333 kHz), otherwise the scanner will use the [default steps](#).

Default Value Off. **Values:** ◀ or ▶ to Off/On.

Menu Help Text: On= Allow any 1250Hz freq Off=Enforce fixed steps

Win500 Name - Extended Settings>
Enable FlexStep

PSREdit Name - General Configuration>Other Options>
Enable FlexStep

ADC Cal Allows you to customize the information shown in the display while in 'Tune' mode. See also [Analyzing Trunking Systems](#).

Default Value Off. **Values:** ◀ or ▶ to OFF, [RSSI](#), [ZM](#), [DSP](#).

Menu Help Text: Show various data within Tune Mode on LCD line 3

Win500 Name - Extended Settings>

PSREdit Name - Weather/Advanced Configuration>

TUNE mode display

Tune Mode Text

RSSI Sig Cal Allows you to customize the signal strength meter bar threshold values for the bars 1-5. Settings of 470 540 610 680 750 provide a wider range indication of signal strength than the default settings. [2]

Default Values:	(WS1040/65)	Suggested Values:	(WS1040/65)	Values: 1-750	Menu Help Text: Signal strength meter thresholds
Bar 1: 370	Bar 1: 190	Bar 1: 470	Bar 1: ?		
Bar 2: 450	Bar 2: 230	Bar 2: 540	Bar 2: ?		
Bar 3: 520	Bar 3: 260	Bar 3: 610	Bar 3: ?		
Bar 4: 610	Bar 4: 290	Bar 4: 680	Bar 4: ?		
Bar 5: 680	Bar 5: 320	Bar 5: 750	Bar 5: ?		
Win500 Name - Extended Settings> RSSI Bar Thresholds				PSREdit Name - Weather/Advanced Configuration> Signal Strength Values	

Bat Icon Cal (HH only) Allows you to customize when the low battery icon shows solid in the display (and hear the audio alert if enabled) and when it blinks. You can set how long you wish to see each based on the voltage of the batteries. My radio will die at about 3.4 volts when it's left alone scanning or searching but be careful; if you set the thresholds too low the radio will die instantly if you put a load on it (navigate menus, switch operations, etc.) - and probably not a good idea for a \$500 scanner.

(Icon)OFF: Once the low battery icon has been turned on, the voltage must rise above this level to turn it back off (hysteresis).

(Icon)ON: If the voltage falls below this level, the (solid) low battery icon is turned on.

BlinkH(Blink OFF): Once the blinking battery icon has been turned on, the voltage must rise above this level to turn the blinking icon and audible alert back off.

BlinkL(Blink ON): If the voltage falls below this level, the blinking (i.e. critical) low battery icon is turned on with the audible alert. Time to change/recharge the batteries. [19]

My opinion on how to best use this feature, which is shown in my suggested settings, would be to just have the icon blink (and also [enable the audio alarm](#) if I'm not real close to the radio) when it's time to replace/recharge the batteries at about 4.0 volts. The radio could start acting strange if you let it drop any lower. I don't need a 1 hour notice to change the batteries which is what the defaults will give you with *healthy* batteries.

Setting Names	Default Values:	Default Voltages:	Suggested Values:	Suggested Voltages:	Values: 1-1023	Menu Help Text: Battery icon thresholds
NiMH OFF	511	4.55	452	4.03		
NiMH ON	502	4.47	451	4.02		
NiMH BlinkH	498	4.44	450	4.01		
NiMH BlinkL	484	4.31	449	4.00		
Alk OFF	471	4.20	452	4.03		
Alk ON	462	4.12	451	4.02		
Alk BlinkH	444	3.96	450	4.01		
Alk BlinkL	430	3.83	449	4.00		
NiCd OFF	502	4.47	452	4.03		
NiCd ON	493	4.39	451	4.02		
NiCd BlinkH	480	4.28	450	4.01		
NiCd BlinkL	466	4.15	449	4.00		

Win500 Name - General Settings>Battery Settings> Icon Thresholds	PSREdit Name - General Configuration>PSR-500/Pro-106 Settings>Battery Settings> Voltage Thresholds
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Trunking Ch# When set to 'On' shows the Motorola trunking channel number in the middle of line 5 of the display. **F2 (TSYS)** still functions. 3600 baud systems will use the [standard trunking channel assignments](#). Systems with custom trunking tables will not use the standard trunking channel assignments.

Default Value Off. Values: ◀ or ▶ to Off/On.	Menu Help Text: Show CC Chan # while showing VC
Win500 Name - Extended Settings> Show trunked chan w/VC	PSREdit Name - General Configuration>Other Options> Show Trunking Channel

Show RadioID When set to 'Yes' shows the radio ID (not tgrp ID), if available, on line 5 of the display. **F1 (TGL/O)**, **F2 (TSYS)**, and **F3 (Stor)** still function. On some trunked systems (e.g. Mot 3600 if the system is programmed for it, and LTR for some talkgroups), will look at low-speed data on the voice frequency, checking for any priority Talk Group information [2].

Notes: If you enter (program) private TGRP objects with the various Radio IDs and alpha tag them, the scanner will show the tag instead of the numeric ID (on line 5). Radio IDs only show in SCAN mode, not PAUSE or MANUAL. Radio IDs are only available on group calls for certain types of trunked systems (i.e. not LTR), and then only if the scanner receives the initial "grant" message on the control channel. If you are scanning more than just a single TSYS, the scanner will likely miss that initial "grant" message and won't be able to show any Radio ID or (if programmed) alpha tag. [5] [6]

Default Value No. Values: ◀ or ▶ to No/Yes.	Menu Help Text: Show RadioID in group calls, if available, on line 4
Win500 Name - Extended Settings> Show Radio IDs for group calls	PSREdit Name - General Configuration>Other Options> Enable RadioID Display

RadioIDAlert The scanner will use any LED/backlight/tone alert settings from programmed *Private* TGRP objects instead of the Group TGRP object's alert settings. For example, you could have a dispatch console's radio ID programmed as a Private TGRP object with alert settings different from the normal "Police Dispatch" Group TGRP object's settings. When the console initiates the call, the scanner will use the alert settings from the Private TGRP object instead of from the Group TGRP object. [5] [6]

Default Value No. Values: ◀ or ▶ to No/Yes.	Menu Help Text: Use RadioID's alert setting if showing tag on line 4
Win500 Name - Extended Settings> Use RadioID Alert	PSREdit Name - General Configuration>Other Options> Use RadioID Alert Values

Bandplan If turned on (Yes/Canada), 5 kHz steps are used in ALL receive modes between 138 and 174 MHz. If not turned on (No/USA), will use the 'Default' steps. CONV objects created in one "mode" will tune based on the "active mode" - that is, if you create a CONV object 138.005 MHz with the feature enabled, the radio will tune to 138.000 MHz if the feature is not enabled (although 138.005 will be displayed). [7] The Canadian band plan also uses 12.5 kHz steps between 406 and 470 MHz.

Default Value USA. Values: ◀ or ▶ to USA/Canada.	Menu Help Text: Controls steps in 138-174 MHz and 406-470 MHz ranges
---	---

Win500 Name - Extended Settings> Allow 5kHz steps 138-174 MHz	PSREdit Name - General Configuration>Other Options> Use 5khz steps from 138-174 MHz
---	---

CCDump Enables the Control Channel Dump feature.	
Default Value No. Values: ◀ or ▶ to No/Yes.	Menu Help Text: Dump CC msgs to PC/IF
Win500 Name - Extended Settings> Dump trunking data to PC/IF	PSREdit Name - General Configuration>Other Options> Enable CC Dump

DSPDump Enables the DSP Dump feature.	
Default Value No. Values: ◀ or ▶ to No/Yes	Menu Help Text: Dump CPU< - >DSP msgs to PC/IF
Win500 Name - Extended Settings> Echo DSP comms to PC/IF	PSREdit Name - General Configuration>Other Options> Enable DSP Dump

Abbreviations:

ADC = Analog to Digital Conversion?	HD2 in CTCSS/DCS mode = reverse burst/turn off code detect	RSSI = Received Signal Strength Indication
CAI = Common Air Interface	HD2 in DG mode = P25 CC detect	SQ = Squelch
CC = Control Channel	HD5 = CTCSS/DCS/NAC detect	VC = Voice Channel
CSQ = Carrier Squelch	IMBE = Improved Multi-Band Excitation	WX = Weather
DG = Digital	NAC = Network Access Code	XF = IMBE detect
DSP = Digital Signal Processor	RF = Radio Frequency	ZM = Zeromatic
ET = End Tone		

Cloning/Uploading/Downloading

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You can clone your PSR 500/600 or Pro-106/651/197/652 to any other PSR 500/600 or Pro-106651//197/652 using just a 1/8" stereo audio patch cord. You will need the high speed USB data cable to upload/download to/from your computer and to use for monitoring your scanner with the software. You will also have to install drivers for the cable (that come with it before you plug it in) to use the cable. The PSR 500/600 includes the high speed USB data cable. If you bought the Pro-106/651/197/652 then you will have to purchase the [GRE USB data cable](#) (\$29.99) separately. The GRE cable that came with my PSR 600 is only 3 feet long. The old (20-047 grey and orange) RS cable I bought for my Pro-106 is about 5-1/2 feet. The new (20-546 black) RS cable says 4-6 feet on their [web page](#) (\$34.99).

Note: Under certain circumstances (?) the [CCDump output setting](#) may interfere with the cloning process. If you experience problems with cloning set CCDump to **Off**.

To Clone from one scanner to another, connect the stereo patch cord to the PC/IF jack on each scanner. For the 'send' radio press **PGM** then **GLOB**. Press ▼ until **Clone Send:** is highlighted then press **SEL**.

To Upload or Download Data, connect the (installed) USB cable to the computer and the 1/8" stereo end to the PC/IF jack on the scanner. Follow the directions in the software to transfer your data.

Firmware Version/Updates and Power-On Menus

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The scanners have power-on keypress sequences that are used as shortcuts to configuration items, like attenuator settings, backlight settings and memory information. They will also allow you to reset the whole scanner or just the 'Global Settings'. The resets do not affect the V-Scanner Folders. Power-on key sequences are also used to place your scanner into firmware upgrade mode for CPU and DSP firmware upgrades.

The first key must be pressed while the Welcome/Owner screen is being displayed.

1 shortcut to **PGM>GLOB>Sound Mode**.

2 shortcut to **PGM>GLOB>Key Beeps**.

3 displays CPU and DSP versions.

 shortcut to **PGM>GLOB>Light Mode** (HH only).

DIM shortcut to **PGM>GLOB>Light Mode** (Base only).

ATT shortcut to **PGM>GLOB>AttenMode**.

0, 0 shortcut to **PGM>GLOB>Memory Info**. Press **F1 (Done)** to exit.

0, 1 clears all working memory and resets all 'Global Settings' to factory defaults. Press **ENT** to continue within 6 seconds.

0, 2 resets all 'Global Settings' to factory defaults. Does not affect working memory. Press **ENT** to continue within 6 seconds.

0, 5 (and 0,6) executes **EEPROM memory test**, then clears working memory and resets all 'Global Settings' to factory defaults. Press **ENT** to continue within 6 seconds.

The firmware in the is divided into three portions; a boot loader, the o/s (CPU) firmware and the DSP (Digital Signal Processor) code. The boot loader is the code which will perform the physical programming of the ICs with new (o/s or DSP) firmware. A user can not update the boot version. The DSP performs specific tasks (such as digital decoding). [16]. Although the 106/651/197/652 and 500/600 are operationally identical, you can not use the firmware for one model in another.

Updates and instructions for the RS models can be found [here](#) (Product Support tab). Updates and instructions for the PSR models can be found [here](#). See also this [post](#) at RR to determine PSR "C" (Canadian) models.

The first key must be pressed while the Welcome/Owner screen is being displayed when you turn on the radio.

0, CLR to erase DSP firmware version. Restores factory DSP firmware version. Press **ENT** to continue within 6 seconds.

0, PGM to upgrade DSP firmware version. Press **ENT** to continue within 6 seconds. Waits for DSP update program from computer.

Hold **PGM** while turning the radio on to show the Boot version and to upgrade the CPU firmware version. Waits for CPU update program from computer.

Default Step Chart (*=Canada Bandplan)

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Frequency Range	*Default Step (kHz)	Mode	Band	Frequency Range	*Default Step (kHz)	Mode	Band
25-26.960	10	AM	VHF Lo Band	156.275-157.450	25 (*5)	FM	Maritime

26.965-27.405	10	AM	CB	157.470-161.5725	7.5	FM	Police-Business-Rail
27.410-29.505	5	AM	VHF Lo	157.455-161.595	*5	FM	Police-Business-Rail
29.510-29.700	5	FM	10m Ham	161.600-161.975	5	FM	Remote Broadcast-Maritime
29.710-49.830	10	FM	VHF Lo Band	162-174	12.5 (*5)	FM	Government Band
49.835-54	5	FM	6m Ham	216.0025-219.9975	5	FM	Maritime
108-136.9916	8.33	AM	Civilian Air	220-224.995	5	FM	1.25m Ham-General Trunked
137-137.995	5	FM	Satellite	225-379.99375	6.25	AM	Military Air
138-143.9875	12.5	FM	Government	380-419.9875	12.5	FM	Military Trunked
138-143.995	*5	FM	Government	420-450	5 (*12.5)	FM	70cm Ham
144-147.995	5	FM	2m Ham	450.00625-469.99375	6.25	FM	Public Safety-Business
148-150.7875	12.5	FM	Government-Satellite	450.0125-512	*12.5	FM	Public Safety-Business
148-150.795	*5	FM	Government-Satellite	470-512	6.25	FM	UHF TV
150.800-150.845	5	FM	Auto Emergency	764-781.996875	3.125	FM	Trunked Public Safety
150.8525-154.4975	7.5	FM	Fire-Business	791-796.996875	3.125	FM	Trunked Public Safety
150.850-154.495	*5	FM	Fire-Business	806-823.9875	12.5	FM	Mobile Trunked Public Safety
154.515-154.640	5	FM	Industry	849-868.9875	12.5	FM	Base Trunked Public Safety
154.500-154.640	*5	FM	Industry	894-939.9875	12.5	FM	33cm Ham-Business Trunked
154.650-156.255	7.5	FM	Police	940-960	6.25	FM	Government-Broadcast
154.645-156.270	*5	FM	Police	1240-1300	6.25	FM	23cm Ham-Government

Notes: the 700MHz and first part of 800MHz ranges here are different than the original owner's manual.

This is what I got with a TUNE search, FlexStep 'Off', BandPlan set to 'USA' then 'Canada'.

*FlexStep (in the 'Expert Settings' menu) will allow step increments of 1.25 kHz.

Footnotes/Related Links

[Contents](#)

[1] From Jeffrey Pryor - [PSR-500 Expert Settings : Information - Google Docs](#).

[2] [PSR500 Operating Hints](#) (PDF). Expert settings based on a spreadsheet by Jeffrey Pryor. Firmware release notes from GRE. Operating hints from Radio Reference Wiki, GRE website, and forum posts, especially those of Don Starr and Mike Vander Veer.

[3] RR thread [Explain the PSR500 Expert Settings please](#).

[4] RR thread [Psr-500 Spectrum Sweeper disappointment](#).

[5] RR thread [pro 106 radio ids](#).

[6] RR thread [Pro-197 Radio ID & Alerts](#).

[7] RR thread [PSR-500/600 1.5 firmware released](#).

[8] RR thread [Big system/Multi-Site mode](#).

[9] RR thread [Advanced Settings](#).

[10] RR thread [PSR-500, beginning conversation clipped](#).

RR thread [Simulcast Digital Distortion](#).

RR thread [Object Oriented Scanners Overload Issues](#).

[11] RR thread [PRO106 P25 \[4 settings\] question](#).

[12] RR thread [Breaks During Transmission](#).

[13] RR thread [Problems with DCS Decode and scanning](#).

[14] GRE Support Desk - [PSR-500/600 "CPU F1.2" and "DSP U1.2" Firmware has been released](#).

[15] GRE Support Desk - [PSR-500/600 Getting the most out of Multisite](#).

[16] RR thread [Pro-106 Firmware?](#)

[17] RR thread [Object Oriented Scanner Issues](#).

[18] RR thread [Programming the PRO-96 and 2096 for Rebanded Motorola Trunked Systems](#).

[19] RR thread [GRE 500 Battery Questions](#).

Finding EDACS LCN order - EDACS frequencies *have* to be programmed in LCN (Logical Channel Number) order. I have found a procedure at the [Trunked Radio Systems User's Page](#) which explains how to find the LCN order for an EDACS system if you don't know the order. Look for 'Finding EDACS Logical Channel Numbers' by Todd Hartzel near the bottom of the page.

Determining Type I Motorola Fleetmaps - You can try a method I found at Radio Reference.com. [Determining Type I Motorola Fleet Maps](#). by Dave Goodson.

Determining Base/Step/Offset for VHF/UHF Motorola Systems - I have found an explanation at [Radio Reference.com](#) that describes how to do this if you don't have the information. The [Trunked Radio Systems User's Page](#) also has an explanation. Look for 'Determining Base and Offset Frequencies for the BC245xlt' by John C.

GRE Support Desk - [PSR-500/600 How to add Custom Table when entering a Motorola UHF trunking system](#).

Decimal/AFS Conversion Chart - Here is a [Conversion Chart](#) to help convert your IDs.

How to view these pages in your browsers

I have formatted these pages so that you can view them with any monitor, in any browser (Firefox, Opera, I.E., or Netscape), at any zoom level, and in any screen area size (ex: 600x800)-small or large fonts. So if the print is too small, go to the 'view' menu in your browser and adjust it to a bigger level (or smaller if you want to see more on the screen).

Finding and reading the date code

The date code or date of manufacture for RS models is located inside the battery compartment of the 106/651 or on the bottom of the 197/652 (Don't rely on the date code on the box). You will see two numbers then a "A" then two more numbers. The first two numbers are the month and the last two are the year. Ex: 01A05 is January of 2005.

Newsgroups and Forums

[Yahoo Groups-PSR-500](#)

[Yahoo Groups-PSR-600](#)

[Yahoo Groups-PRO-651](#)

[Yahoo Groups-PSR500600](#)

[Yahoo Groups-RadioShackPRO-106](#)

[Yahoo Groups-PRO-197](#)

[Yahoo Groups-pro197](#)

[Yahoo Groups-PRO-652](#)

[Yahoo Groups-Win500](#)

[Yahoo Groups-ARC500](#)

Links

[Whistler Updates](#)
[Radio Reference Pro 106 Wiki](#)
[Radio Reference Pro 197 Wiki](#)
[USB Scanner Programming Cable-RS #20-546](#)
[Radio Reference Data Base](#)

[Radio Reference PSR500 Wiki](#)
[Radio Reference PSR600 Wiki](#)
[eHam.net-reviews](#)
[Radio Reference.com](#)

Software

[Win500](#)- recommended!
[PSREdit500](#)
[ARC500](#)
[ID Tracker II/III](#)
[ScanBuddy](#)-monitors/logs Stalker/Sweeper "hits"

[Scan Control](#)
[Pro96COM](#)
[Unitrunker](#)
[TrunkMON](#)



Preset Fleet Maps

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In Motorola II systems (no programming the fleet map required), all the blocks have size code, S0, which has a size limitation of 512 radios. In Type I systems, size codes are used in different blocks to denote the maximum number of users in that block. Notice that size code S-12 uses 2 blocks. A Motorola Hybrid system (Type Iii) has 'blocks' of the system that are Type I Fleets/Subfleets and Type II talkgroups. The maps that are **Hybrid systems are in bold**.

E1P1		E1P2		E1P3		E1P4		E1P5		E1P6		E1P7		E1P8	
Block	Size Code														
0	S-11	0	S-4	0	S-4	0	S-12	0	S-4	0	S-3	0	S-10	0	S-1
1	S-11	1	S-4	1	S-4	1	(S-12)	1	S-4	1	S-4	1	S-10	1	S-1
2	S-11	2	S-4	2	S-4	2	S-4	2	S-12	2	S-4	2	S-11	2	S-2
3	S-11	3	S-4	3	S-4	3	S-4	3	(S-12)	3	S-4	3	S-4	3	S-2
4	S-11	4	S-4	4	S-4	4	S-4	4	S-4	4	S-12	4	S-4	4	S-3
5	S-11	5	S-4	5	S-4	5	S-4	5	S-4	5	(S-12)	5	S-4	5	S-3
6	S-11	6	S-4	6	S-12	6	S-4	6	S-4	6	S-12	6	S-4	6	S-4
7	S-11	7	S-4	7	(S-12)	7	S-4	7	S-4	7	(S-12)	7	S-4	7	S-4

E1P9		E1P10		E1P11		E1P12		E1P13		E1P14		E1P15		E1P16	
Block	Size Code														
0	S-4	0	S-0	0	S-4	0	S-0	0	S-3	0	S-4	0	S-4	0	S-3
1	S-4	1	S-0	1	S-0	1	S-0	1	S-3	1	S-3	1	S-4	1	S-10
2	S-0	2	S-0	2	S-0	2	S-0	2	S-11	2	S-10	2	S-4	2	S-10
3	S-0	3	S-0	3	S-0	3	S-0	3	S-4	3	S-4	3	S-11	3	S-11
4	S-0	4	S-0	4	S-0	4	S-0	4	S-4	4	S-4	4	S-11	4	S-0
5	S-0	5	S-4	5	S-0	5	S-0								
6	S-0	6	S-4	6	S-0	6	S-0	6	S-0	6	S-12	6	S-12	6	S-12
7	S-0	7	S-4	7	S-0	7	S-4	7	S-0	7	(S-12)	7	(S-12)	7	(S-12)

You can tell which block a Motorola ID is in by its number.

Block	Lower ID#	Upper ID#
0	0000	8191
1	8192	16383
2	16384	24575
3	24576	32767
4	32768	40959
5	40960	49151
6	49152	57343
7	57344	65535

Size Code	Fleets	Sub Fleets	Number of Blocks	Number of Talkgroups per Block	Max IDs per Talkgroup	Max Radios per Block
S0	N/A	N/A	N/A	N/A	N/A	512?
S1	128	4	1	512	16	16
S2	16	8	1	128	64	64
S3	8	8	1	64	128	128
S4	1	16	1	16	512	512
S5	64	4	1	256	32	32
S6	32	8	1	256	32	32
S7	32	4	1	128	64	64
S8	16	4	1	64	128	128
S9	8	4	1	32	256	256

S10	4	8	1	32	256	256
S11	2	16	1	32	256	256
S12	1	16	2	8	1024	512
S13	1	16	4	4	2048	512
S14	1	16	8	2	4096	512

Thanks to RadioReference.com for most of this information.

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