EZ Scan Digital Handheld Radio Scanner

OWNER'S MANUAL

WS1080 / WS1088

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Introduction

Scanning technology has changed dramatically over the years. The WS1080 / WS1088 scanner with Object Oriented User Interface is designed to help the hobbyist build a collection of channels to scan:

- Start small and expand
- Organize channels and talkgroups
- Remove unwanted channels and talkgroups

What is Object Oriented Scanning?

Programming scanning receivers can be challenging, but object-oriented programming simplifies the process by using common conventions for scanning concepts that have common characteristics.

A **Scannable Object** is any defined item that can be scanned or monitored, including:

- Conventional, non-trunked radio frequencies
- Talkgroups used on a trunked radio system
- Radio services
- Defined searches

Because scannable objects are defined by the same basic elements, the **Object Oriented User Interface (OOUI)** is designed to simplify scanning by managing all scannable objects similarly. When you learn how to program one type of object, you can program other types of scannable objects as well.

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Features

- Simple keypad and display
- USA/Canada RadioReference database on SD Card
- Quick Location based Programming (City, Zip, County)
- Detects and masks encrypted voice audio
- Decodes RadioID/TalkgroupID data
- Upgradeable CPU Firmware, DSP Firmware and Library
- USB Interface
- Improved P25 Functionality (Phase II, X2-TDMA)
- PC Software to customize your settings
- Signal Strength Meter
- 200 Scanlists
- Weather Radio Functions
- Multi–system Trunking
- Spectrum Sweeper
- Headphone/speaker jack
- Programmable Alert LED
- Programmable Audio Alarms
- Built-in Discriminator Output
- V-Scanner II Storage System
- Audio Recording
- Built-in Clock/Calendar
- Built-in Services Searches

Package Contents

- Handheld Scanner
- Antenna
- USB Cable
- MicroSD Card
- Swivel Belt Clip
- User's Guide
- PC Software included on SD

Scanning Legally

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

These include:

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

According to the Electronic Communications Privacy Act (ECPA), you are subject to fines and possible imprisonment for intentionally listening to, using, or divulging the contents of such a transmission unless you have the consent of a party to the communication (unless such activity is otherwise illegal). This scanner has been designed to prevent reception of illegal transmissions. This is done to comply with the legal requirement that scanners be manufactured so as to not be easily modifiable to pick up those transmissions.

Do not open your scanner's case to make any modifications that could allow it to pick up transmissions that are illegal to monitor. Doing so could subject you to legal penalties. We encourage responsible, legal scanner use. In some areas, mobile use of this scanner is unlawful or requires a permit. Check the laws in your area. It is also illegal in many areas to interfere with the duties of public safety officials by traveling to the scene of an incident without authorization.

FCC Statement

This equipment has been tested and found to comply with the limits for a scanning receiver, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

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

(1) This device may not cause harmful interference.

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

WARNING: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Shielded cables must be used with this unit to ensure compliance with the Class B FCC limits.

Setup

Antenna

To connect the included antenna:

1. Align the slots around the antenna's connector with the tabs on the antenna jack.
2. Press the antenna down over the jack and turn the antenna's base clockwise until it locks into place.

You can use a variety of antennas. To connect and external antenna, follow the installation instructions supplied with the antenna. Always use 50-ohm coaxial cable, such as RG-58 or RG-8 low-loss dielectric coaxial cable. You may also need a BNC adapter.

WARNING: Use extreme caution when installing or removing an outdoor antenna. If the antenna starts to fall, let it go! It could contact overhead power lines. If the antenna touches a power line, touching the antenna, mast, cable, or guy wires can cause electrocution and death. Call the power company to remove the antenna. DO NOT attempt to do so yourself.
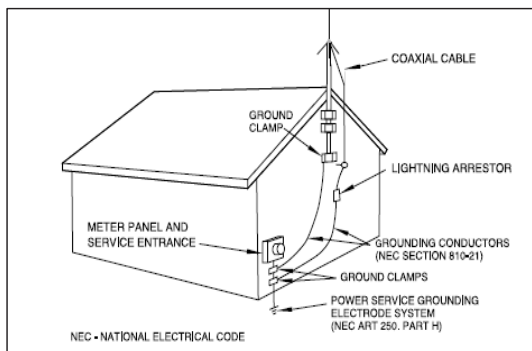
WARNING: Outdoor antennas must be properly grounded to prevent static buildup and lightning damage. Article 810 of the National Electrical Code, ANSI/NFPA 70, provides information about proper grounding of the antenna mast, connection of coaxial cable to an lightning arrestor, size of grounding conductors, location of the lightning arrestor and connection of grounding conductors to grounding electrodes.

Disconnect your radio from the outdoor antenna during electrical storm activity to prevent damage.

Headphones and Speakers

You can plug headphones (not supplied) or an amplified speaker (not supplied) with a 1/8 inch (3.5mm) stereo mini-plug in the headphone jack on top of your scanner. This automatically disconnects the internal speaker.

NOTE: Use an amplified speaker; a non-amplified speakers may not provide sufficient volume for comfortable listening.

Listening Safely

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

Set the volume to zero before putting on headphones. With the headphones on, adjust the volume to a comfortable level.

Avoid increasing the volume after you set it. Over time, your sensitivity to a volume level decreases, so volume levels that do not cause discomfort might damage your hearing. Avoid or limit listening at high-volume levels. Prolonged exposure to high-volume levels can cause permanent hearing loss.

Wearing headphones while operating a motor vehicle or riding a bicycle can create a traffic hazard and is illegal in most areas. Even though some headphones let you hear some outside sounds when listening at normal volume levels, they still can present a traffic hazard. Exercise extreme caution!

Batteries

A low battery warning sounds every 30 seconds (default setting) when the batteries are low.

1. Slide open the battery compartment cover.
2. Set the Battery Type Selector:
   - **ALKA** − Alkaline
   - **NI-MH** − Rechargeable Ni-MH
3. Install four AA batteries, matching the polarity symbols (+ and –).
4. Replace the cover.
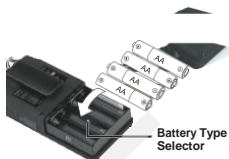
WARNING: Never install alkaline batteries with the Battery Type Selector switch set to NI-MH. Alkaline batteries can get hot or explode if you try to recharge them.

Recycle Rechargeable Batteries

Recycle your old rechargeable batteries at one of the many collection sites in the U.S. and Canada. To find the site nearest you, visit www.call2recycle.org or call toll-free 1-877-2-RECYCLE.

Battery Notes:

- Use only fresh batteries of the required size and type. Do not mix old and new batteries, different battery types (alkaline or rechargeable), or rechargeable batteries of different capacities.
- Dispose of batteries promptly and properly; do not burn or bury them.
- For long-term storage (a month or longer), remove the batteries. Batteries can leak chemicals that can damage electronic parts.
- Do not overcharge rechargeable batteries. Overcharging shortens battery life.

External Power

Always turn the scanner off before connecting or disconnecting power sources. Use the supplied USB cable to connect the scanner to a USB power source (not included).

Some USB power adapters can interfere with the scanner's reception. Using an incompatible USB cable may damage your scanner.

NOTE: If your vehicle's engine is running, you might hear electrical noise from the engine while scanning. This is normal.

Swivel Belt Clip

Swivel clip allows the scanner to move with you and easily move it out of the way without unclipping it from your belt. To attach the Swivel clip to the scanner; align the belt clip grooves to the slots on the back of the scanner. Slide the clip down until it clicks in place. To remove the belt clip, pull back on the small tab and slide the clip upward.

Understanding the Keypad

Your scanner features an easy-to understand backlit keypad.

WS1080

WS1088

Turn on Scanner and Set Squelch

Preset squelch between 10 and 12 o'clock position. While scanning, turn the knob down (counterclockwise) until you hear noise then up (clockwise) a little past where the noise stops. The higher the squelch is set, the stronger the signal required to break the squelch.

Squelch

Power

Press and hold to turn ON/OFF.

Press briefly to toggle the backlight.

Setting Bandplan and Clock

When you first power up your scanner it will prompt you to set the bandplan, date and time.
Press the ◄ or ► key to select the USA or Canada bandplan, then press ►/II/SEL.

      -Bandplan-   -Bandplan-
   ◄   USA   ►   ◄   Canada   ►
   Press SEL to Set   Press SEL to Set

The scanner will then prompt you to enter the current date and time. Press the ◄ or ► key to select the desired digit, then press the ▲ key. Press the the ◄ or ► key to change the value, then press ►/II/SEL. You can skip this process by pressing the **SKIP** key. You can set the clock at any time using the EZ Scan Software.

-Set Clock-
2014-06-03 Sat
11:00:25
Press SEL to Set
or SKIP to Exit

The Bandplan and Date/Time prompts appear only once on initial power-up. You can change the Date and Time from the Main Menu and the Bandplan from the Setting menu.

Program Methods

There are two methods to program your scanner. To get started quickly, you can use **"Set Location."** The set location method stores objects in your area automatically and puts them in Scanlists 151 and higher. These Scanlists are already named, **"Multi Dispatch," "Law Tac," "Interop" "Fire Talk,"** and so forth. This method gets you scanning in minutes, but you cannot monitor a single police or a single fire department – they will all be together in the same Scanlist. Also, if you use set location, and wish to add a new location, be sure to **"Clear Channels"** to erase old objects before storing the new location. If you store more than one ZIP code, the scanner will spend a great deal of time searching for objects that are out of range. That will cause the scanner to miss some local transmissions you want to hear.

Although it takes longer, experienced users will want to program Scanlists on their own using the "Step by Step" method. Use **"Browse Library"** to select your state and county and look for agencies of interest. Check the boxes of objects you wish to import, select the Scanlist you want to put them in and perform the import (see **Manual Programming** pg. 23). Once you save objects to a Scanlist, rename the Scanlist so you don't forget what you stored there. Then import more objects into a different Scanlist and rename that one. In this way, you can create Scanlists such as Bethel Police, Hurst Police, Bethel Fire, Shenango EMS, etc. Individual scanlists allow you to decide exactly what you want to scan.

Setting Location

Your scanner can select services to scan based on your location. Press **MENU** and scroll to **"Set Location"** and press the ▶ key.

You can specify your location by City, County or ZIP Code. Scroll to the desired method and press the ▶ key. If you select City or County, the scanner will prompt you for your State. Use the ▲or▼ key to select the first letter of your State, then press the ▶ **/II/ SEL** key. Scroll to your state and press the ▶ key. Use the ▲or▼ key to select the first letter of your City or county, then press the ▶ **/II/SEL** key. Scroll to your City or County, then press the ▶ key.

```
Select County:     ▰▰▰
First letter:      A
SEL = Done
```

If you select ZIP Code, the scanner will prompt you to enter your five-digit ZIP Code. Use the ▲or▼ key to adjust each digit, then use the ◀ or ▶ key to select each digit. When you are done, press the ▶ **/II/SEL** key.

```
ZIP Code

00000

◀ ▶ moves cursor
SEL=OK  MENU=BACK
```

NOTE: Although you can program multiple locations, to get maximum scanner performance its best to program only 1 location or ZIP code. Scanning multiple locations will cause missed transmissions due to the scanner searching for out of range frequencies.

SETTING LOCATION

You can accept a preselected set of Default Types for your location, or you can specify Custom Types (see next section). To select the Default Service Types, press the ▶ key, then the ▶/II/SEL key to import the Default Set of Service Types for that City or County. Wait for the Import process to end, then press the ▶/II/SEL.

-Confirmation- ▬▬

Really do import
operation?

SEL=Yes   SKIP=No

To perform additional imports, press the ▶/II/SEL key and proceed as before. Press the **SKIP** key to return to the Main Menu.

To select Custom Types, press the ▶ key. Scroll through the list of Services and press the ▶/II/SEL key to select Services you wish to import. A checkmark appears next to each selected Service.

Services: ◥◣

    SEL = Toggle

 Multi Dispatch

 Law Dispatch   ☐

 Fire Dispatch   ☐

 EMS Dispatch   ☐

When you are done, press the ▶ key, then the ▶/II/SEL key to import the selected services. Press the **SKIP** key to return to the Service list without importing. To perform additional imports, press the ▶/II/SEL key and wait for import process to end. Press the **SKIP** key to return to the Main Menu.

Services selected through Set Location are automatically assigned to Scanlists beginning at number 151; each selected Service is assigned to a separate Scanlist, which is given the name of the service.

SETTING LOCATION

These Scanlists are automatically selected for Scanning. You can select or deselect Scanlists as desired through the Scanlist item on the Main Menu.

NOTE: Press ◀ or **MENU** to return to main menu.

Objects can be backed up to the first available V-Scanner folder from the Set Location menu (See V-Scanner II section for a discussion of Folders). We recommend you back up your data to guard against accidental changes or deletions. From the Set Location menu scroll to Backup Data and press the ▶ key.

```
-Set Location-      ▬
By City
By County
By ZIP Code
Backup Data        ▶
Clear Channels
```

Press the ▶/II/SEL key to back up your data, or press the **SKIP** key to return to the Set Location menu without backing up.

```
-Confirmation-     ▬
Really backup to
first available
VScanner folder?
SEL=Yes,    SKIP=No
```

To clear all data from the current Folder on the Set Location menu scroll to Clear Channels and press the ▶ key. On the Confirmation screen press the ▶/II/SEL key to clear the data, or press the **SKIP** key to return to the Set Location menu without clearing.

```
-Confirmation-     ▬
Really clear ALL
programmed data
from the current
folder?
SEL=Yes,    SKIP=No
```

NOTE: The Clear Channels function erases all of your current scanning data; all Scanlists in this Folder will be empty. Use this function carefully, as it cannot be undone. Does not affect V-Scanner folders content.

Power up Password

Set a user defined power-on password to restrict access to the radio.

1. Press **MENU**.

2. Scroll to Set Password and press ▶.

3. Use the arrows to set the password.

4. Use the ▶/II/SEL key to accept the updated settings, or the **MENU** key to exit without saving changes.

NOTE: Power-on password can be reset by anyone using the EZ Scan software. Password provides only limited protection from immediate unauthorized use.

Understanding the Display Icons

A row of icons at the top of the display provides status information about the scanner. These icons are defined as follows:

T	The scanner is currently receiving trunking control channel data.
G	The attenuator is set for Global mode.
A	When present, the attenuator is active.
GA	When present, Global attenuator is on, and the attenuator is active.
S	The radio's squelch circuit is open.
AM	AM mode is active.
FM	FM mode is active.
NF	Narrow FM mode is active.
DG	The radio is receiving P25 digital audio with AGC.
Dg	The radio is receiving P25 digital audio without AGC.
IF	The radio's IF (discriminator) output mode is active.
E	Encrypted digital traffic detected.
F	Audio recording is enabled but recording is suspended. The MicroSD card is almost out of space. Delete or archive older audio files to make room for new recordings.
▶	Scanning
●	Audio is being recorded on the active or selected Object.
▄▄▁▃▅▇	Signal meter indicating signal strength.
▌▌	Scanner is in Pause mode (monitoring a single Object).

▬▬▮   Battery status indicator

▬   External power connected

P/p   Priority On/Priority Off

S/s   Skip On/Skip Off

D/d   Delay On/Delay Off

L/-   Lock Out On/Lock Out Off

EZ Scan Library

Your scanner comes with an installed MicroSD card that contains the entire USA/Canadian RadioReference database as well as the EZ Scan software. **Note:** Make a copy of the EZ Scan software files in case the SD card is lost or damaged.

To remove the MicroSD card from the scanner:

WARNING: To prevent corrupted data on the SD Card, always turn the scanner off using the front panel power key before opening the battery compartment cover.

1. Turn off scanner, unplug external power, and remove the batteries.

2. Press and release the MicroSD card.

3. To reinsert the MicroSD card, with the label facing the front of the radio press it in until it clicks in place.

NOTE: Always use the EZ Scan software "Prepare Scanner Memory/SD Card For Use" option under the "Scanner/ SD Card" menu to format the SD Card if the card is not performing as expected or if the scanner does not power up with the SD Card.

The MicroSD card comes formatted for the standard FAT file system with a cluster size of 32k.

To format additional cards (2GB or smaller), use only the EZ Scan software to format the SD card.

• Format using the FAT file system with 32k clusters.

EZ Scan LIBRARY

- If you use MicroSD cards larger than 2GB, format using FAT32 with 32k clusters.

- Formatting the MicroSD card for other file system types may cause EZ Scan to malfunction.

Connecting the scanner to a computer with the supplied USB cable allows you to access the card with the EZ Scan software and update the Library, edit the configuration and stored objects, optimize the card, and reformat the card if necessary. You can also connect the SD Card to an external reader, which may provide faster data transfer rates when compared to accessing the card while it is in the radio.

For reference, below is the directory structure for the Micro SD Card. You may wish to make a copy of the CDAT folder on your computer as a backup. The CDAT folder contains your EZ Scan programming. Modifying these directories or their contents outside of the scanner or the EZ Scan software is not recommended, and may cause the scanner to malfunction.

BTMP Contains various temporary files used by the scanner
CDAT Contains your programming
CDAT_VS.nnn Contains programming for V-Scanner folder number nnn, where nnn may range from 001 to 200
DB Contains the Library
MTMP Contains various temporary files used by the scanner
STMP Contains various temporary files used by the scanner
CURVS.DAT Configuration information
CONFIG_.BIN Configuration information
REC Audio recordings
SOFTWARE EZ Scan Software

WARNING: Modifying these files, directories or contents of directories is not recommended, and may cause the scanner to malfunction, and may result in loss of programming data.

You can purchase additional cards to store different configurations or backups for your EZ Scan data. Up to a 32GB SD card may be used.

Installing EZ Scan Software

A method for programming a new scanner is using the supplied USB cable and the included software. Also www. RadioReference.com provides a range of resources to help improve your overall scanning experience.

EZ Scan easy-to-use software helps you:
- Make changes to EZ Scan's programming and configuration
- Update the Library to the most current version
- Update EZ Scan's firmware for enhancements and bug fixes
- Format and maintain the MicroSD card

To install, connect the scanner to your computer's USB port. Using windows explorer, open the SD Card to view files, select software, then select setup.exe and follow the on-screen instructions.

Accept all prompts when asked. User's can also insert the SD Card into your computer via a card reader, open the SD Card, find and open the "Software" folder and click on "setup.exe", then follow the on-screen instructions. You can import, configure, and update the library directly with your scanner or with the EZ Scan software.

Library Updates

Your EZ Scan comes with the most current library data available from www.RadioReference.com. However, you can use the EZ Scan Software to check for updates to the library data.

NOTE: Updating the RadioReference library requires an internet connection.

To check for library updates:
1. Select **Check for Library Update** in the update menu. Select **Check for Updates** to start.
2. If updates are available, click **Download Updates**.
3. When the update is complete, click **Done**.

Manual Programming - From Library

1. From the Main Menu, select Browse Library.
2. Select country.
3. Select first letter of State/Province.
4. Select State/Province.
5. Select Counties/Cites.
6. Select first letter of County.
7. Select County.
8. Select Data Type **NOTE:** Police/Fire and Emergency services will be in "Categories" for smaller towns, "Systems" for larger ones.
9. Select desired agency, category or system available for the county.
10. Select desired subcategory. Investigate listings by pressing ▶ to go deeper into that selection. When the cursor switches from the right side of the screen to the left, you are at the bottom of a category. **NOTE:** When selecting a System, check at least one of the "Sites" in range, then go further into Categories to find objects.
11. Use the SEL button to check boxes for services you wish to monitor. Press **SEL** to un-check a selected service and at anytime press ◀ to go back. Once all desired objects have been checked, press **MENU**.
12. Select Import Selected.
13. Select desired scanlist location for selected objects and press ◀ to save.
14. Press **SEL** to continue to main menu.
15. Select Scanlists from main menu. Use the ▲/▼/◀ /▶ to rename the scanlist if desired. Confirm box beside desired scanlist is checked.
16. Repeat steps to add additional scanlists, or select Scan from the Main Menu to begin scanning.

NOTE: When traveling or for quick programming, refer to location based, ZIP code programming, beginning on page 14 of the User's Guide.

LIBRARY STRUCTURE

Manual Programming - Enter Conventional Frequency

1. Press **Menu** to access Main Menu.
2. Select "Enter Conv Freq".
3. Simply write over the existing frequency or press "SKIP" to clear. Using the ▲▼, ◄► buttons enter the desired conventional frequency. Press **SEL** when finished.
4. Scroll to "Save Changes" then press **SEL**.
5. Current Scan list and Object information is displayed in the Browser screen. Press **Menu** to change settings such as to change the Scan list, Tag info etc.
6. When finished making changes select "Save Changes".
7. Press **MENU** until Main menu.

EZ Scan Library Notes

- A "D" indicates that the item uses an unsupported digital modulation and cannot be monitored.
- An "S" indicates a trunked system that is not supported by the scanner.

A solid box (■) indicates that some frequencies in a grouping are selected, but not all.

Library Structure

Each **State** contains three data types:
Agencies – Statewide agencies using conventional frequencies.
Systems –- Trunked systems, including control frequencies (sites) and talkgroups.
Counties/Cities – County or independent city

- **Agencies** – Non-government businesses using conventional frequencies.
- **Categories** – Local government and public safety using conventional frequencies
- **Systems –** Trunked systems, including control frequencies (sites) and talkgroups.

NOTE: Not all states have a statewide trunked radio system.

WARNING: Modifying these directories or their contents is not recommended and may cause EZ Scan to malfunction.

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Editing Objects Manually

From the main menu, select **Browse Objects**, browse to an object and press **Menu**. **Note**: Not all options are available on all objects.

Alpha Tag	The object name. Press ◀ or ▶ to move the cursor; press ▲or▼to change the value.
Set Scanlists	Changes the objects Scanlists.
RX Mode	Changes object's receive mode: FM, NFM (Narrow FM), Auto, AM
SQ Mode	Changes object's Squelch mode: None, CTCSS, DCS, NAC, SRCH (Search)
SQ Search	Turns Squelch Search on or off
Store SQ Code	Only appears when MENU is pressed while monitoring a conventional channel that is set for CTCSS or DCS search mode. Select Store SQ code to store the value of the found CTCSS or DCS code. Subsequent transmissions must have matching CTCSS or DCS squelch codes to be monitored by the scanner.
SQ Exclude	Turns Squelch Exclude on or off. Allows certain CTCSS/DCS codes to be excluded.
Locked Out	Locked objects (indicated by an L) are not scanned.
Skipped	Skipped objects are not scanned.
Priority	EZ Scan frequently checks priority channels for activity. Priority status is indicated by an upper case P.
Delay	The scanner waits for a reply for two seconds after a transmission ends before resuming a scan.
Attenuate	Applies attenuation to the channel.
AGC	Reduces interference from strong local transmitters. (Only available for conventional frequencies.)

Alarm	An alarm sounds when activity is found for a frequency or talkgroup. Press ◄ or ► to select an alarm sound.
Light	Press ◄ or ► to select the desired light options: **Leave –** use default backlight settings **On –** turn the backlight on **Flash –** flash according to the set flash pattern
Flash Pattern	A light pattern used to identify the channel.
On Time / Off Time	The backlight duration for each flash pattern step. (10 millisecond increments. 50 = 500 milliseconds = .5 seconds).
Led Enabled	Turns on/off the Alert LED for this object.
Led Flash	Alert Led will flash when enabled.
Color Count	Select 1 to 4 colors to be displayed when Object is Active. Option 0= off
Color 1-4	Sets the individual colors for each option.
Record	Set Recording when Object is active.
Delete Object	Removes the channel from EZ Scan's working memory. The channel remains in the library data.

Alert LED Settings

The Alert LED has been enhanced.
These enhancements provide powerful new capabilities for customizing the Alert LED, giving you even more flexibility to show unique colors and flash patterns when transmissions are received on important talkgroups and channels. The following program charts are examples of how the Alert LED can be configured to produce unique and noticeable effects and colors.

1. Press **Menu**.
2. Select Browse Objects.
3. Use the ◀ or ▶ to select a Scanlist.
4. Use the ▲ or ▼ to select an object within the selected Scanlist.
5. Press **MENU** to enter object options. (options are shown in the following examples) Scroll till "Flash Pattern" is shown and press the ▶.
6. A list of 8 characters are displayed (55555555). Adjust each one to obtain the flash pattern desired. Options are 0-9 and A-F. See Flash pattern chart for how each number/letter will control the Alert LED.
7. Once set press **SEL** to accept the flash rate. Press ◀ to import the items. (This may take several minutes.)

0:	○	○	○	○	**8:**	●	○	○	○
1:	○	○	○	●	**9:**	●	○	○	●
2:	○	○	●	○	**A:**	●	○	●	○
3:	○	○	●	●	**B:**	●	○	●	●
4:	○	●	○	○	**C:**	●	●	○	○
5:	○	●	○	●	**D:**	●	●	○	●
6:	○	●	●	○	**E:**	●	●	●	○
7:	○	●	●	●	**F:**	●	●	●	●

●=on   ○=off

EXAMPLE: Using the above chart with pattern 3B3B3B3B, the LED pattern for "3" is "off/off/on/on" and the LED pattern for "B" is "on/off/on/on." With this selection the Alert LED will flash back and forth between "off/off/on/on" and "on/off/on/on." The flash pattern goes in order from left to right.

NOTE: Both the flash rate and color options are in hexadecimal format.

ALERT LED SETTINGS

On Solid - Single Color

Flash Pattern	n/a
On Time	n/a
Off Time	n/a
LED Enable	Checked
LED Flash	Unchecked
Color Count	1
Color 1	FF0000 (red)
Color 2	n/a
Color 3	n/a
Color 4	n/a

These settings will illuminate the LED with a single color, solid, no flashing when the Object is receiving traffic.

Slow Flash - Single Color

Flash Pattern	55555555
On Time	50
Off Time	50
LED Enable	Checked
LED Flash	Checked
Color Count	1
Color 1	FF0000 (red)
Color 2	n/a
Color 3	n/a
Color 4	n/a

These settings will illuminate the LED with a single color, flashing on and off at the rate of one cycle per second.

Slow Flash - Two Color

Flash Pattern	55555555
On Time	50
Off Time	50
LED Enable	Checked
LED Flash	Checked
Color Count	2
Color 1	FF0000 (red)
Color 2	0000FF (blue)
Color 3	n/a
Color 4	n/a

The settings shown above will illuminate the LED with a two colors, flashing on and off at the rate of one cycle per second. The LED will be illuminated for 1/2 second and off for 1/2 second each period and will alternate colors each flash.

ALERT LED SETTINGS

Highway Department 1 - Strobe Effect

Flash Pattern	A8A8A8A8
On Time	5
Off Time	9
LED Enable	Checked
LED Flash	Checked
Color Count	1
Color 1	FFFF00 (yellow)
Color 2	n/a
Color 3	n/a
Color 4	n/a

These settings produce a rapid yellow pulsing strobe effect.

Highway Department 2 - Strobe Effect

Flash Pattern	A8A8A8A8
On Time	5
Off Time	9
LED Enable	Checked
LED Flash	Checked
Color Count	2
Color 1	FFFF00 (yellow)
Color 2	FFFFFF (white)
Color 3	n/a
Color 4	n/a

These settings produce a rapid yellow and white strobe effect.

Police Department 1 - Strobe Effect

Flash Pattern	A8A8A8A8
On Time	5
Off Time	9
LED Enable	Checked
LED Flash	Checked
Color Count	1
Color 1	0000FF (blue)
Color 2	n/a
Color 3	n/a
Color 4	n/a

These settings produce a rapid blue pulsing strobe effect.

ALERT LED SETTINGS

Police Department 2 - Strobe Effect

Flash Pattern	AAAAAAAA
On Time	5
Off Time	9
LED Enable	Checked
LED Flash	Checked
Color Count	1
Color 1	0000FF (blue)
Color 2	n/a
Color 3	n/a
Color 4	n/a

The settings produce a rapid blue continuous strobe effect.

Police Department 3 - Strobe Effect

Flash Pattern	AAAAAAAA
On Time	5
Off Time	9
LED Enable	Checked
LED Flash	Checked
Color Count	2
Color 1	0000FF (blue)
Color 2	FF0000 (red)
Color 3	n/a
Color 4	n/a

These settings produce an alternating blue/red strobe effect.

Fire/EMS 1 - Strobe Effect

Flash Pattern	AFAFAFAF
On Time	5
Off Time	1
LED Enable	Checked
LED Flash	Checked
Color Count	2
Color 1	FF0000 (red)
Color 2	FFFFFF (white)
Color 3	n/a
Color 4	n/a

The settings produce an intense red/white strobe effect.

Fire/EMS 2 - Strobe Effect

Flash Pattern	AAAAAAAA
On Time	5
Off Time	9
LED Enable	Checked
LED Flash	Checked
Color Count	2
Color 1	0000FF (blue)
Color 2	FF0000 (red)
Color 3	n/a
Color 4	n/a

These settings produce a rapid red/white strobe effect.

Christmas Tree - Flasher Effect

Flash Pattern	FFFFFFFF
On Time	50
Off Time	1
LED Enable	Checked
LED Flash	Checked
Color Count	4
Color 1	FF0000 (red)
Color 2	FFFFFF (white)
Color 3	00FF00 (green)
Color 4	FFFFFF (white)

Just for fun.

Recording and Playback

Your scanner features a powerful audio recording system that captures transmissions that occur on selected Objects to the MicroSD card using the high quality, industry standard .AU audio file format. For example, a 2GB MicroSD card with a very large scanning configuration (e.g., 500 MB) still leaves room for over 50 hours of recording time and thousands of recorded transmissions! Here are just a few of the things you can do with the audio recording system:

- Record all transmissions that occur on talkgroups or channels that are of interest to you for later review.
- Perform attended or unattended searches for new frequencies, automatically storing audio with frequency information for all transmissions found while searching.
- Record all transmissions that occur on ALL talkgroups or channels, providing an instant recall function to replay a prior transmission that was missed or unintelligible.

Audio recording is not enabled by default. To enable audio recording, make sure that the Enable Record option in the Settings menu is checked, and set the Record flag in any Objects that you wish to record. You may wish to record audio for all of your programmed Objects, which provides the ability to instantly replay any transmission that the radio receives in cases where the traffic may be difficult to copy.

When recording is enabled radio wide and for selected Objects, you will see the ● icon flash in the display when the audio recorder is actively recording audio information.

RECORDING AND PLAYBACK

When the MicroSD card is almost full, the F icon will appear in the display to indicate that recording is suspended. Delete or archive old audio files to make room for new recordings. To playback recorded audio files:

1. From the Main Menu, select Playback to enter the Playback System.
2. The Playback System will place you at the last audio file that was recorded by the radio. Press the ▶/II/SEL key to play the file, or use the ▲ and ▼ keys to scroll to another file for playback.
3. While playing a file, the ▲ and ▼ keys set the playback volume, and the ◀ or ▶ keys move backward and forward in the file being played in five second increments. The SKIP key ends playback of the current file.
4. After scrolling to a file, you can press the **MENU** key for a list of playback options.

- **Main Menu** jumps to the Main Menu.
- **Back** jumps back to the list of recorded files.
- **Play From Here** plays the current recording and all recordings afterwards.
- **Delete All** deletes all recorded audio files.
- **Delete Earlier** deletes recorded audio files prior to the selected audio file.
- **Delete Later** deletes the selected audio file and all recorded audio files after the selected file.

The EZ Scan Software includes advanced audio file playback and management features in addition to the audio playback and management features in the radio.

33

Using the IF Output

Your scanner can provide its IF/discriminator output signal to the headphone jack. The IF/discriminator output is unsquelched and unfiltered, making it ideal for third party signal analysis and decoding software and hardware.

To activate IF Output mode:

1. Press **Menu**.

2. Scroll to the Settings menu. Press ▶ to continue.

3. Scroll past the Expert section to the IF Out setting.

4. Press the ▶ to scroll through the available options:

   Off = disables the IF output function.
   HP = routes the IF/discriminator signal to the headphone jack.
   HP/SP = routes the IF/discriminator signal to the headphone jack and the speaker.

Internal Clock/Calendar

Your scanner includes a real time clock/calendar that is used to correctly date and time stamp recorded audio files. The first time you power on your scanner, you will be prompted to set the time and date.

If batteries are allowed to fully discharge, or if they are removed from the scanner for more than a few minutes, the date and time will need to be set again. You can also set the date and time over the USB connection using the EZ Scan Software, or directly on the radio using the Set Clock function in the Main Menu.

Scanning

Monitoring and Scanning

When programmed, your scanner provides two basic functions for scanning radio transmissions:

- **Monitoring** – Listening to a single object.
- **Scanning** – Checking multiple saved objects, stopping when a transmission is detected.

To scan more quickly, you can skip or lock out frequencies that you do not wish to scan. A skipped frequency is ignored during the current scan; a locked out frequency is ignored for all scans unless it is unlocked.

To monitor a frequency or talkgroup:

1. From the main menu, select **Browse Objects**, then press ▶.
2. Use the direction keys to browse Scanlists and objects.
3. Press ▶**/II/SEL** to monitor the displayed frequency.
4. Press ◀ or ▶ to select another object or press ▶/II/SEL to begin scanning.

To scan your active Scanlists:

1. Press **Menu**.
2. Select **Scan** from the main menu and press ▶ or ▶**/II/SEL**.
3. To pause the scan, press ▶**/II/SEL** when scanner stops on a transmission. To resume scanning, press ▶**/II/SEL** again.

To enable or disable Scanlists:

1. Select **Scanlists** from the main menu, and then press ▶.
2. Press **SEL** to enable a Scanlist. A checkmark (✓) indicates an active Scanlist. A square (☐) indicates a disabled Scanlist.
3. Press ◀ or **MENU** to return to Main Menu.

To lock out objects:

1. From the main menu, select **Browse Objects**, then press ▶.
2. Use the direction keys to browse objects then press **MENU**.

3. Select **Locked Out** and press ▶. A checkmark
(✓) indicates Lockout is selected. A square
(☐) indicates Lockout is disabled. An uppercase **L**
in the display indicates a locked out frequency.

NOTE: The SKIP button can be programmed in the Settings
Menu (first option under the Expert section) to perform the
Lockout function.

To skip transmissions while scanning:

1. Wait for scanner to stop on the transmission
and press **SKIP**. An uppercase ⊆ in the display
indicates a skipped object.
2. To skip a specific object, you can browse to the
object and press **SKIP**.
3. To restore a skipped object, browse to it and
press **SKIP**.
4. To restore all skipped objects, in the main menu,
select **Restore Skipped** and press ▶.

NOTE: If the specific object is locked out vs. skipped the
SKIP button may have been programmed as Lockout
function.

TIP: Consider how you plan to organize your objects for
scanning. You can organize your scan lists
geographically, assigning objects for your location in
one list and objects for other locations in different lists.
You can organize your scan lists by trunking system,
assigning TGRP objects associated with specific trunked
radio systems to separate lists.

To rename a Scanlist:

1. Select **Scanlist** from the main menu, and then
press ▶.
2. Select a Scanlist and press ▶. The Scanlist name
appears.
3. Press ◀ or ▶ to move the cursor; press ▲ or ▼
to change the character. Press **SKIP** to delete a
character.

To set priority objects:

1. Browse to the object and press Menu.
2. Select Priority and press ▶. A checkmark (✓)
indicates an Priority is selected. A square (☐)
indicates Priority is disabled.

NOTE: To set priority, Priority Mode must be enabled in
the Configuration menu. Setting any object as a priority
can cause normal scanner interruption.

Scanlists and Scan Sets

Scan Sets are an exciting new feature with the WS1080 / WS1088. There are 20 Scan Sets that work in conjunction with Scanlists to provide additional scan object selection capability and flexibility. Each Scan Set contains a list of all 200 normal Scanlists plus the special Skywarn Scanlist.

With Scan Sets you can quickly select large groups of Scanlists to enable or disable, just by enabling or disabling the Scan Sets that contain the desired groups of Scanlists, instead of individually editing the list of enabled Scanlists every time you want to change the group of Scanlists you wish to monitor.

For example:

On Scanlist 01 you decide to put all of City1. On Scanlist 02 you decided to put all of City 2, on Scanlist 03 you decided to put all of City 3. By default all Scanlists are enabled for Scan Set 01. The scanner will scan all these Scanlists even though they may be out of range. You can program other Scan Sets to have certain Scanlists enabled or disabled to make it easier for you to scan only the lists you know are in range. For example you can program Scan Set 02 to enable only Scanlist 01 which is City 1, and disable all others. You can program Scan Set 03 to enable only Scanlist 02 which is City 2, and disable all others, etc. This way instead of having disable each Scanlist you are not using, you can select the Scan Set you need, which you have already programmed for a specific area. This would be mostly beneficial if you had many Scanlists programmed for different locations or departments.

Scanlists and Scan Sets follow this simple rule:
If an object is mapped to an enabled Scanlist, AND, that Scanlist is enabled, AND, that Scanlist is a member of an enabled Scan Set, THEN, that
object will be scanned when the **SEL** key is pressed.

Scanlists and Scan Sets

In the Main Menu's Scan Sets function, scroll to a Scan Set that you wish to configure. Note that you can give the Scan Set a meaningful name by pressing the ▶ key, then following the onscreen instructions to change the Scan Set name. Press the **SEL** key to save your changes.

Press the **MENU** key to configure the Scan Set members. Scroll through the Scanlists and use the **SEL** key to add a checkmark next to each Scanlist that you want included as a member of the Scan Set. When finished, press the **MENU** key to return to the listing of Scan Sets. Repeat this process for each Scan Set you wish to define and use.

To exit the list of Scan Sets, press the ◀ key.

To begin scanning with Scan Sets, use the Main Menu's Scan Sets function to scroll the list of Scan Sets and place checkmarks next to each Scan Set you wish to scan using the **SEL** key. You can remove an individual Scanlist from the set by disabling it in the Main Menu's Scanlists function, but remember, it will need to be re-enabled when you want to scan it again.

Searching

You can locate active frequencies quickly and easily using one of the Scanner's three convenient frequency search modes:

- **Spectrum Sweeper** – sweeps rapidly through frequency ranges in 1 MHz blocks.
- **Service Search** – searches through frequencies used by the following radio services: Public Safety, Aircraft, Railroad, Amateur, CB, Marine, and FRS/ GMRS/MURS. This is a good way to find activity on local frequencies.
- **Limit Search** – searches within a range of frequencies that you define.

To use Spectrum Sweeper:

1. In the main menu, select Search, and press ▶ to enter the search menu.
2. Select Spectrum Sweeper and press ▶.
3. Select All Bands or Public Safety and press right (▶) to start the search. Spectrum Sweeper sweeps through frequency ranges in 1 MHz blocks.
4. Press **MENU** to stop search which enters Sweeper menu. See page 41.

To perform a Service Search:

1. In the main menu, select Search, and press ▶ to enter to the search menu.
2. Select Service Search and press ▶.
3. Scroll through the available services, select a service, and press ▶ to start the search.
4. Press **MENU** to stop search which enters service menu. See page 41.

SEARCHING

To perform a Limit Search:

1. In the main menu, select Search, and press ▶ to enter to the search menu

2. Select Limit Search, and press ▶. The search begins immediately.

3. To change the search range, press **MENU**.

4. Scroll to Lo and press ▶.

5. Press ◀ or ▶ to move the cursor; press ▲ or ▼ to change the value.

6. Press **SEL** to save the new value and return to the search menu.

7. Scroll to Hi and press ▶.

8. Press ◀ or ▶ to move the cursor; press ▲ or ▼ to change the value.

9. Press **SEL** to save the new value and return to the search menu.

10. Press ◀ to continue the search.

11. Press **MENU** to stop search when enters Limit Menu,

To save found frequencies:

1. Press **MENU**.

2. Then select Store Channel and press **SEL**. EZ Scan adds the frequency to the default Scanlist and names it based on the search type.

Search Settings

To change search settings, press **MENU** while the search is active.

Spectrum Sweeper Settings

- **Atten** – Attenuation. On or Off.
- **Zeromatic** – On or off.
- **Delay** – How long scanner waits after a transmission before resuming.
- **Special Mode** – Skips 1 MHz block where you have skipped five or more frequencies. Special Mode is useful when you are close to many high-power transmitters that are close together in frequency.
- **Frequency Ranges** – Defines a frequency range to focus a search.

Service Search Settings

- **Atten** – Attenuation. On or Off.
- **Zeromatic** – On or off.
- **Delay** – How long scanner waits after a transmission before resuming.
- **Frequency Ranges** – Defines a frequency range to focus a search.
- **Rx Mode** – Set the RX modulation mode to automatic, or forces AM mode or FM mode. RX Mode functions in Aircraft and Amateur bands, Press ◀ or ▶ to change.

Limit Search Settings

- **Atten** – Attenuation. On or Off.
- **Zeromatic** – On or off.
- **Delay** – How long scanner waits after a transmission before resuming.
- **Lo** – Lowest frequency in the search range.
- **Hi** – Highest frequency in the search range.

SAVING FOUND CODES

Saving Found CTCSS or DCS Codes

When importing objects from the Library, squelch code (CTCSS or DCS subaudible) is automatically imported. If this information is missing, your scanner can quickly identify these codes during a search, if present.

When a conventional channel includes a CTCSS or DCS code, the code appears on the bottom line of the display, followed by an "⚡", which indicates a valid CTCSS or DCS code:

CTCSS 127.3   ⚡

To save the found code with the channel:

1. When a CTCSS or DCS code is found by the search feature, press **MENU**. Store SQ code appears.

2. Press **SEL**.

After the code is saved, the scanner will only stop on transmissions that have a matching CTCSS or DCS squelch code present.

Note: In the Settings Menu, **Simple Display** must be unchecked to display and save found CTCSS and DCS codes.

Weather Monitoring

A weather alert tone includes a digitally-encoded **SAME** (Specific Area Message Encoding) signal, **FIPS** (Federal Information Processing Standard) code, and an event code.

Before you can use SAME Standby Mode, you must program at least one FIPS code.

To receive severe weather broadcasts while scanning other channels, set your local NOAA channel as the Weather Priority channel.

To program FIPS Codes:

1. Look up your local FIPS code(s) (located at: www.NWS.NOAA.gov/NWR/indexnw.htm).

2. Press 🜨 to activate Weather Mode, then press **MENU**.

3. Scroll to SAME 1 Tag and press ▶ to name the channel. Press ◀ or ▶ to move the cursor; press ▲ or ▼ to change the character.

4. Scroll down to SAME 1 FIPS and press ▶ to enter a FIPS code. Press ◀ or ▶ to move the cursor; press ▲ or ▼ to change the character.

5. Scroll down to SAME 1 Enable and press **SEL** or ▶.

6. To program more FIPS codes (up to 10), repeat steps 3-5.

7. When finished, select Save Changes and press **SEL** or ▶.

NOTE: Programming only one FIPS code will result in alerts intended only for your county. For fringe areas, it may be beneficial to program a second FIPS code for nearby counties.

To activate SAME Standby Mode:

1. Press 🔵, and then press ◀ or ▶ to select a NOAA channel.

2. Press **SKIP** to enter Standby Mode. The speaker silences and $SKIP = Normal$ appears at the bottom of the screen.

3. To return to Normal Weather Mode, press **SKIP** again.

To activate Weather Priority:

1. Press 🔵 to begin scanning for weather frequencies. When scanner stops on the strongest NOAA channel, press **MENU**.

2. Select $Priority$ and press ◀ or ▶ to select the channel.

3. Scroll to $Save\ Changes$ and press ▶/ **II/SEL** or ▶ to save.

Skywarn™

Skywarn repeaters relay severe weather reports from amateur radio repeaters directly to local National Weather Service offices.

To importing Skywarn Frequencies:

1. Browse for Skywarn frequencies in the EZ Scan library and import them to the Skywarn Scanlist.

2. Enable the Skywarn Scanlist.

To activate Skywarn:

1. Press 🔵 once to enter Weather Mode.

2. Press 🔵 again to activate Skywarn.

NOTE: Skywarn temporarily disables all other Scanlists.

Configuring

Using V-Scanner Storage

V-Scanner II Storage System
The WS1080 / WS1088 V-Scanner II (VS-II) system provides you with a way to store multiple configurations on your scanner. VS-II configurations are created, managed and copied to the SD Card using the EZ Scan software.

You can load stored VS-II configurations by selecting the V-Scanner option from the Main Menu, then scrolling to the desired VS-II configuration using the ◀ or ▶ keys. Press the **SEL** key to activate the selected VS-II configuration. Any changes that you have made to the current VS-II or default configuration will be automatically saved to the SD Card before the selected VS-II configuration is loaded.

All V-Scanner folder creation and management is performed using the EZ Scan software. Data in your VS-II folders is updated automatically in the field as you use them. Unlike previous versions of the V-Scanner feature, it is not necessary to "save" and "load" the VS-II folders you are working with - just select the desired VS-II folder and the radio handles the rest automatically.

NOTE: It is not possible to create or delete VS-II folders while in the field. All VS-II folder management is accomplished using the EZ Scan software.

Configuration Settings (EZ Scan)

To access configuration settings, select **Settings** from the main menu, and press ▶.

- **Default Vals** – Restores default settings.
- **Simple Display** – Limits displayed information.
- **Default SL** – Sets the default Scanlist.
- **Priority Mode** – Enables Priority mode.
- **Priority Time** – Time between priority scans.
- **Enable Record** – Turns on the record feature.
- **Search Record** – when active unit records transmissions found while searching.
- **G Atten Mode** – Enables Global Attenuation.
- **G Atten On** – Activates Global Attenuation.
- **Search Dg AGC** – Applies Digital AGC to found digital transmissions.
- **G AGC Mode** – Enables Global AGC.
- **G AGC On** – Activates Global AGC.
- **Scan Sets Opt** - Turns on Scan Set Feature.
- **Sounds** – Sets EZ Scan beeps and alert sounds.
- **Alerts** – Controls audio alerts.
- **Key Beeps** – Enables or disables key tones.
- **Beep Volume** – Sets key tone volume.
- **Alert Volume** – Object and low battery alert volume.
- **Contrast** – Sets the LCD contrast.
- **LModeBAT** – Backlight mode during battery operation.
- **LModeEXT** – Backlight mode during external power operation.
- **LiteArea** – Sets LCD and keypad lighting.
- **LiteTime** – Backlight duration.
- **LiteLevel** – Controls backlight brightness.
- **Welcome Text 1-5** – Sets the message when EZ Scan is first turned on.
- **Skip** - Programmed to "lockout" will permanently locks out an object when the **SKIP** button is pressed.

CONFIGURATION SETTING

- **Blink Time 1-2** – Controls the amount of time each item is displayed.
- **Show Radio ID** – Displays the Radio ID for trunked systems, if available.

    Tag Only.
- **Use RID Alert** – Controls alert for Radio ID transmissions.
- **Show VC/CC** – Displays voice and control channel. **Simple Display** must be unchecked. **Show Radio ID** will override if available.
- **Show TGID** – Displays talkgroup ID. **Simple Display** must be unchecked.
- **Show Site Name** – Displays trunking site name, only if two or more trunking system sites are programmed. **Simple Display** must be unchecked.
- **CONV TGID** – Displays the talkgroup ID for P25 conventional talkgroup calls. **Simple Display** must be unchecked.
- **CONV Radio ID** – Displays the Radio ID for P25 conventional calls. **Simple Display** must be unchecked.
- **PC/IF CCDump** – Streams ASCII Control Channel Dump data over the USB interface for trunking control channels.

    To file – Stores ASCII Control Channel Dump data to the MicroSD card.

    Limit 100

    Trim Logs
- **Low Batt Time** – Interval (seconds) between low-battery alert sounds.
- **Charge Time** – Sets the radio charge time.
- **TG Disp** – Display format for talkgroup IDs.
- **M36 Stat Bits** – Uses status bits to track Motorola 3600 baud trunking talkgroup calls.
- **M36 ENC**
- **EDACS Dig**

CONFIGURATION SETTING

- **BandPlan** – Selects USA or Canada.
- **FlexStep -** Permits using Split channel frequency.
- **EncMode** – For encrypted voice calls: Noise, Silent, or Tone.
- **EncLevel** – Sets the encrypted call tone level.
- **IF Out** –Routes the IF Discriminator signal to the headphone jack.
- **DSPLevelAdapt** – Controls how fast the DSP adjusts to varying P25 levels (default: 64). Higher values = faster rates.
- **ADC Gain** – Controls input signal to CODEC (default: +0dB).
- **DAC Gain** – Sets output signal from CODEC, varying the audio level of decoded digital signals (default: +0dB).
- **Auto Power On**

     At 00:00

     Mode:
- **Location Select**

UPDATING EZ Scan SOFTWARE

Using EZ Scan Software to update the Scanner

1. Turn off the Scanner. Disconnect the USB cable from the scanner, but keep the USB cable connected to your computer.

2. While pressing the **Menu** key, connect the USB cable to the Scanner. The current boot and CPU versions appear on the display, followed by the CPU SW Upgrade prompt.

NOTE: To exit this mode without updating press **MENU** again.

3. Select **Check for CPU Firmware Updates** in the update menu.

4. Click **Check for Updates** on the update screen.

5. If there are available updates, click **Update My Scanner**.

6. When complete, click **Done**.

DSP Firmware Updates

1. Turn off the Scanner.

2. Connect the scanner to your computer using the USB cable supplied. The computer should recognize the scanner's MicroSD card as a new drive. If an autorun screen appears, close it.

3. Select **Check for DSP Firmware Update** in the update menu.

4. Click **Check for Updates**.

5. If there are available updates, click **Update My Scanner.**

6. When complete, click **Done**.

Updating the Library (PC)

To update the PC library:

1. On the Library Import Tab, click the **Update Channels** button. A second Import screen appears.

2. Click the **Update Channels** button. The library will be updated to the latest version.

NOTE: The procedure to update the RadioReference library requires an internet connection.

Updating the Library (EZ Scan)

To update the EZ Scan library:

In the Main Menu, select Update from Lib and press ▶.

The scanner asks if you want to use new Alpha Tag (names) from the library.

Press **SEL** for yes or **SKIP** for no.

NOTE: Unit must be connected to an external power source.

Troubleshooting/Error Messages

For detailed troubleshooting/error messages, please visit the FAQ section of our website at www.whistlergroup.com or call toll free 866-923-8719.

Maintenance

Keep the scanner dry; if it gets wet, wipe it dry immediately. Use and store the scanner only in normal temperature environments. Handle the scanner carefully; do not drop it. Keep the scanner away from dust and dirt, and wipe it with a damp cloth occasionally to keep it looking new.

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

Birdie Frequencies

Birdies are operating frequencies, which all scanners have, that are created inside the scanner's receiver and can cause interference. If the interference is not severe, you adjusting the squelch might omit the birdie, but if you program one of these frequencies after a search, you will hear only noise on that frequency.

If you suspect that a frequency you have programmed is being affected by a birdie, try removing the antenna. Removing the antenna will help determine if the interfering signal is a birdie signal being generated inside of the scanner, or the result of an external interference source. If the noise on a frequency is not affected when the antenna is removed, it is almost certainly the result of a birdie. If the noise disappears when the antenna is removed, the noise is most likely coming from an external source. Moving the scanner may reduce or solve the issue.

Library Copyright Notice

Specifications

Receiving modes .... AM, FM, FM-MOT (Motorola), LTR (EF Johnson), CTCSS, DCS, ... NAC on P25, EDACS wide/narrow (GE/Ericsson/HARRIS), P25-Phase I, X2-TDMA, P25-Phase II
Receiving system .... Triple conversion PLL super heterodyne
WX frequencies .... 162.400, 162.425, 162.450, 162.475, . 162.500, 162.525, 162.550 MHz
Display .... Full dot matrix bitmap LCD (132x65 dots)
Sensitivity .... (fm 12 dB SINAD quieting unless otherwise noted)
VHF   Low   .... 0.2   µV
VHF   Aircraft (20 dBq AM) .... 0.4   µV
VHF   High 137-174 MHz .... 0.3   µV
VHF   High 216-300 MHz .... 0.4   µV
UHF   Low 300 - 406MHz .... 0.8   µV
UHF/UHF-T 406 - 512 MHz .... 0.4   µV
UHF   High 764 - 960 MHz .... 0.5   µV
1240 - 1300 MHz .... 0.5 µV
Squelch sensitivity (band center)
Threshold .... AM/FM 0.5 µV
Tight .... (S+N)/N: AM 20 dB, FM 25 dB
Spurious rejection .... VHF High at 154.1 MHz: 40 dB
(Except Primary image)
 Signal to noise ratio .... 35-40 dB typical (100 µV input signal)
Scanning rate without trunking .... 138–47.9 MHz:70ch/second (in 100 kHz Intervals)
Search rate .... 162.25 − 167.25 MHz: 80 steps/sec.
Scan and Search delay time .... 2 seconds
Audio max. power RF input :100 µV at 154.1 MHz (DEV:3kHz at 1kHz)
8 Ohms Resistor Load at speaker terminal (BTL): 500 m Watts

Intermediate frequency
1st .... 380.8 MHz
2nd .... 21.4 MHz
3rd .... 455 kHz
Current drain .... 8 Ohm internal speaker at 154.1 MHz, 5V Ext Power, Squelched: 170 mA (Back light off/without charging)
Antenna impedance .... 50 Ohms
Temperature range (optimal) .... –10°C to 60°C
Speaker .... Built-in 36 mm 8 Ohms dynamic speaker
Operating voltage .... DC 4.8 Volts (4 AA Ni-MH batteries)
.... DC 6 Volts (4 AA alkaline batteries)
External power and charge voltage .... USB Power (DC 5V 500mA)
Dimensions (HWD) .... 5.31 x 2.12 x 1.06 inch (135 x 67 x 28 mm)
Weight .... 7.4 oz. (210g)
Without antenna and batteries

FREQUENCY COVERAGE

Frequency Coverage

25.000-26.960 MHz	(in 10 kHz steps/AM)
26.965-27.405 MHz	(in 10 kHz steps/AM)
27.410-29.505 MHz	(in 5 kHz steps/AM)
29.510-29.700 MHz	(in 5 kHz steps/FM)
29.710-49.830 MHz	(in 10 kHz steps/FM)
49.835-54.000 MHz	(in 5 kHz steps/FM)
108.000-136.9916 MHz	(in 8.33 kHz steps/AM)
137.000-137.995 MHz	(in 5 kHz steps/FM)
138.000-143.9875 MHz	(in 12.5 kHz steps/AM)
144.000-147.995 MHz	(in 5 kHz steps/FM)
148.000-150.7875 MHz	(in 12.5 kHz steps/FM)
150.800-150.845 MHz	(in 5 kHz steps/FM)
150.8525-154.4975 MHz	(in 7.5 kHz steps/FM)
154.515-154.640 MHz	(in 5 kHz steps/FM)
154.650-156.0450 MHz	(in 7.5 kHz steps/FM)
156.0500 MHz	(FM)
156.0525-156.1725 MHz	(in 7.5 kHz steps/FM)
156.1750 MHz	(FM)
156.1800-156.2475 MHz	(in 7.5 kHz steps/FM)
156.2500-156.2550 MHz	(in 5 kHz steps/FM)
156.275-157.450 MHz	(in 25 kHz steps/FM)
157.470-160.8225 MHz	(in 7.5 kHz steps/FM)
160.8250 MHz	(FM)
160.830-161.5725 MHz	(in 7.5 kHz steps/FM)
161.600-161.975 MHz	(in 5 kHz steps/FM)
162.000-174.000 MHz	(in 12.5 kHz steps/FM)
216.0025-219.9975 MHz	(in 5 kHz steps/FM)
220.000-224.995 MHz	(in 5 kHz steps/FM)
225.000-379.99375 MHz	(in 6.25 kHz steps/AM)
380.000-419.9875 MHz	(in 12.5 kHz steps/FM)
420.000-450.000 MHz	(in 5 kHz steps/FM)
450.00625-512.000 MHz	(in 6.25 kHz steps/FM)
764.000-781.996875 MHz	(in 3.125 kHz steps/FM)
791.000-796.996875 MHz	(in 3.125 kHz steps/FM)
806.000-823.9875 MHz	(in 12.5 kHz steps/FM)
849.000-868.9875 MHz	(in 12.5 kHz steps/FM)
894.000-939.9875 MHz	(in 12.5 kHz steps/FM)
940.000-960.000 MHz	(in 6.25 kHz steps/FM)
1240.000-1300.000 MHz	(in 6.25 kHz steps/FM)
137.000-174.000 MHz	(in 5 kHz steps/FM) Canada
380.000-512.000 MHz	(in 12 kHz steps/FM) Canada

*Excludes frequencies utilized by the Cellular Mobile Radiotelephone Service: 824-848.9875 MHz and 869-893.9875 MHz

WARRANTY

Consumer Warranty

This Whistler product is warranted to the original purchaser for a period of one (1) year from the date of original purchase against all defects in materials and workmanship, when purchased from an authorized Whistler retailer. **This limited warranty is void if the unit is abused, misused, modified, installed improperly, or if the housing and/or serial numbers have been removed.** There are no express warranties covering this product other than those set forth in this warranty. All express or implied warranties for this product are limited to one (1) year. *Whistler is not liable for damages arising from the use, misuse, or operation of this product including but not limited to loss of time, inconvenience, loss of use of your product or property damage caused by your product or its failure to work, or any other incidental or consequential damages including personal injury.*

DO NOT RETURN ITEM TO STORE WHERE PURCHASED.
FOR WARRANTY INFORMATION, CONTACT WHISTLER CUSTOMER SERVICE AT 1-866-923-8719.

Representatives are available to answer your questions
Monday – Friday
from 8:00 a.m. to 5:00 p.m. CT

Service Under Warranty

During the warranty period, defective units will be repaired or replaced (with the same or a comparable model), at Whistler's option, without charge to the purchaser when returned prepaid, with dated proof of purchase to the address below. Units returned without dated proof of purchase will be considered out of warranty and therefore are not covered by the described Limited Warranty. (Refer to Service Out of Warranty section.)

Due to the specialized equipment necessary for testing Whistler products, there are no authorized service centers other than Whistler. When returning a unit for service under warranty, please follow these instructions:

WARRANTY

1. Ship the unit in the original carton or in a suitable sturdy equivalent, fully insured, with return receipt requested to:

Whistler Repair Dept.
1412 South 1st St.
Rogers, AR. 72756

Please allow 3 weeks turnaround time.

IMPORTANT: Whistler will not assume responsibility for loss or damage incurred in shipping. Therefore, please ship your unit insured with return receipt requested. **CODs will not be accepted!**

2. Include with your unit the following information, clearly printed:

*   Your name and physical street address for shipping (no PO Boxes), a daytime telephone number, and an email address (if applicable).
*   A detailed description of the problem (e.g.,"device will not Power ON").
*   A copy of your dated proof of purchase or bill of sale.

3. Be certain your unit is returned with its serial number. Units without serial numbers are not covered under warranty.

IMPORTANT: To validate that your unit is within the warranty period, make sure you keep a copy of your dated proof of purchase. For warranty verification purposes, a copy of your dated store receipt must accompany any Whistler product sent in for warranty work.

WARRANTY

Service Out Of Warranty

Units will be repaired at "out of warranty" service rates when:

- The unit's original warranty has expired.
- A dated proof of purchase is not supplied.
- The unit has been returned without its serial number.
- The unit has been misused, abused, modified, installed improperly, or had its housing removed.

The minimum out of warranty service fee for your Whistler Scanner is $120.00 (U.S.). If you require out of warranty service, please return your unit as outlined in the section "Service Under Warranty" along with a cashier's check or money order in the amount of $120.00. Payment may also be made by MasterCard, VISA or American Express. **Personal checks are not accepted.**

In the event repairs cannot be covered by the minimum service fee, you will be contacted by a Whistler technical service specialist who will outline options available to you.

IMPORTANT: When returning your unit for service, be certain to include a daytime telephone number and an email address (if applicable).

Customer Service

If you have questions concerning the operation of your Whistler product, or require service during or after the warranty period, please call Customer Service at **1-866-923-8719**.

Representatives are available to answer your questions Monday - Friday from 8:00 a.m. to 5:00 p.m. (CT) or visit the F.A.Q.'s at www. **whistlergroup**.com.

CORPORATE HEADQUARTERS
1716 SW Commerce Dr. Ste. 8
PO Box 1760
Bentonville, AR 72712
Toll Free (800) 531-0004
TEL (479) 273-6012
FX (479) 273-2927
www.whistlergroup.com

CUSTOMER RETURN CENTER
1412 South 1st St.
Rogers, AR 72756
Customer Service Tel (866) 923-8719
Email: info@whistlergroup.com

For US Patent info visit: www.whistlergroup.com/pat