

SPECIAL NOTICE FOR QUICKLY GETTING ON THE AIR

This radio is designed to be used by both the beginning novice who is not familiar with DMR and is intimidated by terminology such as Color Code, Repeater Slot, Tx Contact, Rx Group List, Four Level FSK, Convolution Encoding and Decoding, Cyclic Redundant Coding, and other terms related to Digital Communication as well as the experienced HAM who knows what most of those terms mean.

This radio has two modes. The first mode is for the novice that allows you to work on all the networks including Brandmeister and DMR-MARC without ever looking past this page and without ever having to turn on a computer.

The Second mode is for the more advanced HAM who knows what these terms mean and is not intimidated with programming the radio using a computer but also wants the ability to do things on the fly.

Getting on the air quickly

Press the Top side button (Not the PTT)

- (1) When you hear a station you want to respond to, press the left button just below the screen. If you want to try another station, press the right button just below the screen and repeat above until you find a station and conversation you want to join.
- (2) Press the PTT key to transmit and release it to receive.
- (3) When you get a chance change your ID from Connect System to your own by going to the DMR MARC website explained later in the manual.

Notice to the user

Government law prohibits the operation of unlicensed radio transmitters within the territories under government control. Illegal operation is punishable by fine or imprisonment or both. In some countries possibly even death!

THANK YOU

We are grateful you choose a Connect Systems Incorporated radio! Since 1983, Connect Systems Incorporated has been engaging in research and development of radio communications technologies, it has always been our goal to make products the industry wants at a fair price. In most cases our design is at the bleeding edge of technology at a price much less than our competitors. We also offer complete and customized communication solutions to our commercial clients. Our products will satisfy you because of its excellent performance, unique features, and outstanding price. No matter what field you are in, you will be satisfied with the radio.

This manual is applicable to

UHF digital FM transceiver model: BF-CS580

VHF Digital FM transceiver model: BF-CS581

Warning !

◆ In explosive atmospheres (flammable gas, dust particles, etc.), do not turn the power on or off or press the PTT until you are away from that danger. Pressing a switch can generate a spark which can ignite an explosive atmosphere.

Precautions

It's important that the operator is aware of and understands hazards common to the operation of any radio. Please observe the following safety precautions to prevent radio damage or personal injury. The following precautions shall be observed during operation, service and repair of this radio.

◆Excessive Tx use will get the radio hot and might damage or ignite a surface with a low melting point or low Ignition point.

◆Don't leave the transceiver in direct sunlight for a long time. Don't place the transceiver on extremely hot, damp or dusty area and don't put it on unstable surfaces.

◆When restriction or warnings are posted regarding the use of radio devices, please obey the regulation and turn the radio off;

◆Use of the radio while you are driving may be against local traffic laws. Do not use the radio if it is prohibited while driving and be very cautious if there are no local laws because using the radio while driving is distracting.

◆If you notice any problems with the radio please turn it off and then contact us. Do not modify this radio unless instructed by this manual.

◆Please keep the surface of the radio clean and dry. You can clean the radio using a cloth moistened with clean water and a mild dishwashing liquid. Do not immerse the radio in a liquid because it is not waterproof.

◆Remember, you bought the radio with your money so treat it as you own it.

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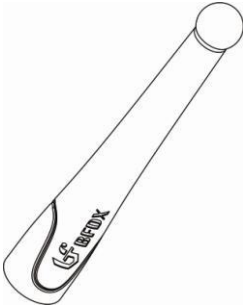
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After carefully unpacking the transceiver, identify the items listed in the table below. If any items are missing or have been damaged during shipment please contact the dealer immediately.

Accessories

| Items | Number | Quantity |
|----------------|--------|----------|
| Antenna | | 1 |
| Strap | | 1 |
| Belt Clip | | 1 |
| Charger | | 1 |
| Li-ion Battery | | 1 |
| Screws | | 1 |

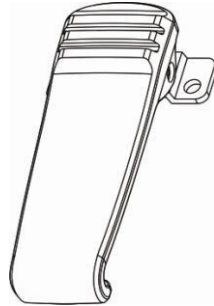
Antenna



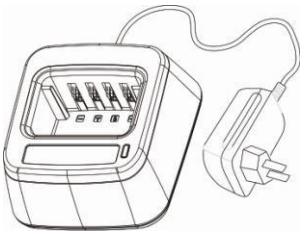
Strap



Belt Clip



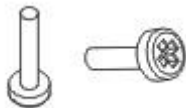
Battery Charger



Battery



Screws



Installation of Accessories

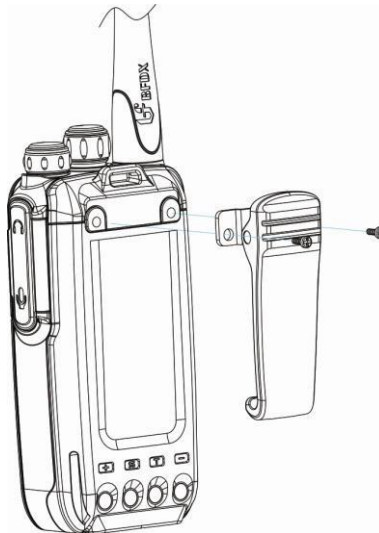
Installation or removing the antenna

Hold the supplied antenna by its base, then screw it clockwise into the connector on the top panel of the radio until firmly seated. Turn the antenna counter-clockwise to remove it.



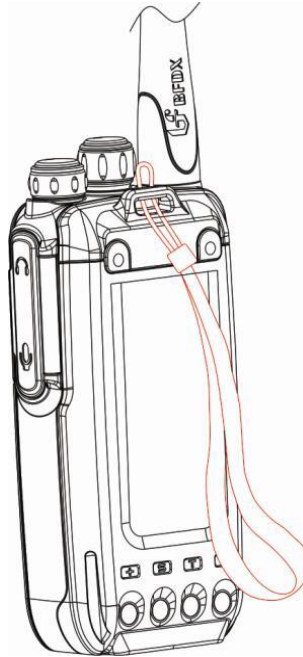
Installation or removing the belt clip

Attach the belt clip using the two supplied binding screws. Remove the belt clip by removing the two binding screws holding the belt clip to the body of the radio.



Attaching/Removing the strap

Thread the hand strap to the loop back of your two-way radio.

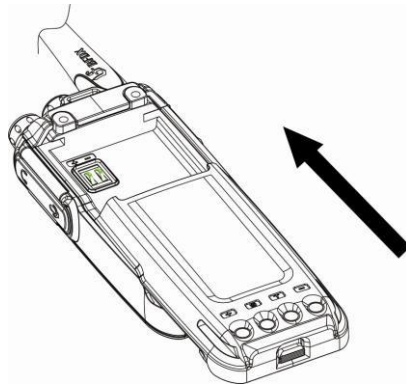


Attaching/Removing the Battery

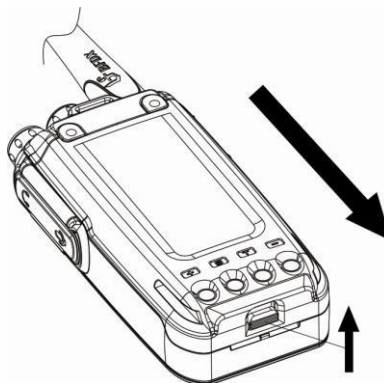
Warning !

- ◆ Don't short-circuit the battery because it might cause the battery to burst into flame or otherwise be damaged.
- ◆ Never attempt to remove the casing from battery because you might be exposed to caustic chemicals and you will damage the battery.
- ◆ Don't throw the battery into fire or change it in an explosive area if you value your life.

Match the guides of the battery with the corresponding grooves on the upper rear of the radio then press the battery until a click is heard to lock it in place.



To remove the battery, please turn the power off then press the release latch to unlock the battery and pull the battery away from the radio.



Note: Don't attach or remove the battery if the radio is turned on.

Li-ion battery features

New batteries are activated from factory. Please charge your battery before using it. The maximum battery capacity and performance is achieved after three full charge/ discharge cycles.

- The service life of batteries is determined by the number of Charge cycles. To prolong battery life, do not charge more than necessary and do not try to charge until the battery remaining capacity is low. To not keep it in the charger after the battery is fully charged.

- To reduce self-discharge, please remove the battery from the radio if you do not plan on using it for a long time and store your battery in a cool, dry location.

- Charge your battery to about 50% of its capacity before you store it for a long period of time to prevent a decrease in the batteries performance.

- As the battery is charged and discharged repeatedly, the battery capacity decreases. Even if the battery is unused, the battery degrades. Storing the battery at high temperature will shorten its lifecycle.

Charging the Li-ion battery

- When the battery power runs low the radio will send alert sounds. Please recharge the battery at that time.

- Please only use the battery and charger specified by Connect Systems.

- When charging a battery attached to a radio, please turn the radio off.

- Please don't remove the battery from the charger before fully charged, or the battery could be damaged.

- Please remove the battery when the battery is fully charged. Do not keep the battery in the charger to be trickle charged.

Note: While the battery is charged, the ambient temperature must be within 0~40 degrees centigrade, Temperature out of that limit may reduce the working life or charging efficiency.

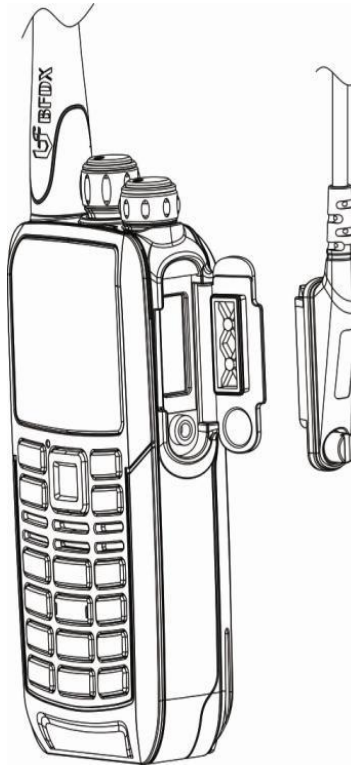
Charging Steps

1. Place the battery or the radio attached with a battery in the charger.
2. Plug the AC connector of the power supply into the outlet socket.
3. Making sure the battery is connected to the charger, the charging process initiates when the charger indicator glows red.
4. The charger indicator glows green when the battery is fully charged.

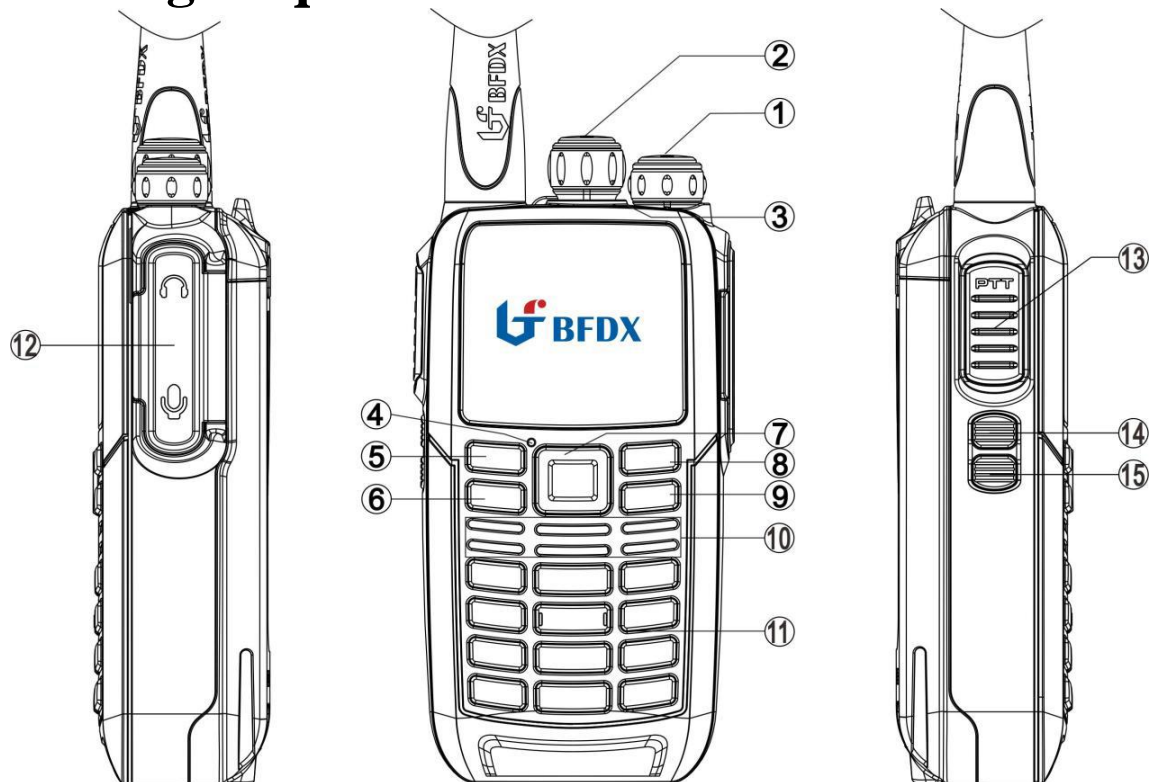
Note: If the charger indicator will not glow, then the battery is not connected to the charger, the battery is damaged, the charger is damaged, the power supply is damaged, the temperature is out of limits, or the power supply is not connected to AC power.

Attaching the Speaker/Microphone

Open the accessory jack cover, then align the plug with the accessory jack and tighten the screw on the plug.



Getting Acquainted



① Power switch/volume adjust keys

Turn clockwise to switch the radio power on, when the radio is turned on, rotate clockwise to increased volume, counter- clockwise to decrease the volume. Turn counterclockwise fully to switch the radio off.

② Channel Selector Knob

Turn the knob to select channel 1-16.

③ LED Indicator

1. When transmitting LED glows red;
2. When receiving LED glows green;
3. When un-programmed LED glows red;
4. When scanning LED flashes orange.

④ MIC

⑤ Left key

Press to move to the next step or store the setting.

⑥ MENU

Press to enter menu mode, you can select the desired menu item.

⑦ Selection Key

Press up or down/left or right to select the menu function item

⑧ Right key

Press to move back to the previous menu.

⑨ HOME key

Press to quickly return home screen.

⑩ Speaker

○11 Numerical

To input numbers and letters

○12 MIC-SP-USB Jack

Connect to optional speaker/MIC and USB programming cable.

○13 PTT key

Press and hold down the PTT key then speak into the microphone to transmit.

○14 Button 1
























Press to activate the programmable function. (The detailed consult to basic operation)

○15 Button 2

Press to activate the programmable function. (For details consult basic operation)

Basic Operation

LCD Icons

| | |
|---|---------------------------|
|  | Signal Strength |
| H/L | High/Low Power |
|  | Digital Mode |
|  | Analog Mode |
|  | Private Call |
|  | Group Call |
|  | All Call |
|  | Scanning on |
|  | unread message |
|  | Inbox or Outbox Full |
|  | Message send successfully |
|  | Message send failed |
|  | Read Message |
|  | Unread Message Inbox |
|  | Missed Call |
|  | Keypad Locked |
|  | disable all tone alert |
|  | Emergency on |
|  | VOX on |
|  | Plug in earphone |
|  | Direct /Talk around Mode |
|  | Monitoring |
|  | Connect to Computer |
|  | Battery Capacity |

Turning the power on /off

Rotate the power switch/volume control clockwise to turn the power on.

Rotate the power switch/volume control counter-clockwise to turn the power off.

Note: If you activate “power on password” function via programming software, each time you turn on radio, the 6 digit password must be entered. If you enter the wrong password, the radio will restart automatically and you must enter password again. If you enter the wrong password three times in a row, you brick the radio and you must reprogram the radio to use it again. Please enable power on password with due care.

Adjusting the volume

After the radio is powered on, you can rotate the power switch/volume control to adjust the volume level. Rotate the knob clockwise to increase the volume or rotate the knob counter-clockwise to decrease the volume.

Selecting a Channel

Turn the channel selector knob to select channel 1 to 16. Rotate the knob clockwise to increase the channel number, or rotate the knob counter-clockwise to decrease the channel number. If enabled, the radio channel number will be audibly annunciated when you change the channel.

Note: If a channel is not programmed, the display says : ”Unprogrammed Channel”, there is an audible message saying “No Channel” and the LED indicator flashes red.

Selecting a Zone

The radio supports up to 64 zones each with a maximum of 16 channels. With all zones used up to 1024 channels can be used. You may select a desired zone through “zone” menu or setting “zone toggle” selection function to button 1 or button 2. To select the zone, use the “Selection Key” to scrolling through the zones and then when the proper zone is highlighted, press the “OK” key. If voice enabled, the current radio channel number will be audibly annunciated when you change the zone.

Call

Each digital channel may assign a contact and the assigned contact could be a private call contact, a group call contact or an all call contact. To transmit on analog channels, press and hold down the PTT key, wait for the LED indication to glow red and then speak 3 to 4 centimeters away from the microphone.

Note: If the talk permit indication feature is set to “Digital”, “Analog” or “Digital & Analog” and you press the PTT key, the radio will generate a momentary beep on the speaker.

Private Call

If the feature “private call ACK” is enabled, when transmitting a private call, the radio will monitor if current ID is available or not.

- (1) If you assigned the Tx Contact parameter to be a private call contact for current digital channel, pressing the PTT key will transmit a private call.
- (2) If you go to the List Submenu in the Contacts menu and you select a private call Contact, then pressing the PTT key will transmit a private call.
- (3) If you go to the Manual Call Submenu in the Contacts menu and you enter a private call number, then pressing the PTT key will transmit a private call.
- (4) If you go to the Call Log menu and select a private call number you want to call, then pressing the PTT key will transmit a private call;
- (5) If you assign the One Touch Call key as private call, then pressing the PTT key after you select that One Touch Call key will transmit a private call.

Group Call

(1) If you assigned the Tx Contact parameter to be a group call contact for current digital channel, pressing the PTT key will transmit a group call.

(2) If you go to the List Submenu in the Contacts menu and you select a group call Contact, then pressing the PTT key will transmit a group call.

(3) If you go to the Call Log menu and select a group call number you want to call, then pressing the PTT key will transmit a group call;

(4) If you assign the One Touch Call key as group call, then pressing the PTT key after you select that One Touch Call key will transmit a group call.

All Call

(1) If you assigned the Tx Contact parameter to be an all call contact for current digital channel, pressing the PTT key will transmit an all call.

(2) If you go to the List Submenu in the Contacts menu and you select an all call Contact, then pressing the PTT key will transmit an all call.

(3) If you go to the Call Log menu and select an all call number you want to call, then pressing the PTT key will transmit an all call.

Receiving and responding to a call

On digital channel, when a private call is received, you may press the PTT key within the preset time period to call back. If you do not respond to a received private call within the preset time period, the radio will display the missed call icon. When a group call is received, you may press the PTT key within the preset time period to call back. If you do not respond to a received group call within the preset time period, the radio will display the missed call icon. You cannot respond to an all call.

Note: With channel free indication feature enabled, when the PTT key is released, a tone will be generated.

Button setting

You may program button1 and button2 for special functions as defined below. Each key can be defined separately for differently functions depending on if you give the key a short press or a long press.

| | |
|-------------------------|---|
| Unassigned | This key is not assigned with any function |
| One Touch Call 1~6 | Allow user to initiate digital group call, digital private call, call alert or send preset message via the one touch call function. |
| Manual Dial for Private | You can manually input the private call number for calling. |
| Emergency On | Allow user to make an emergency call. |
| Monitor | Enables and disables the monitor function |
| Backlight Auto On/Off | This function allows the user to have the backlight on continuously or only on for five seconds after a key has been pressed |
| Keypad Lock | Allows user to enable the keypad lock feature. If the keypad lock is enabled user can only operate the PTT key and side button. Press MENU and # key to unlock. |
| Scan On/Off | Allow user to enable or disable the scan function. |
| All Alert Tones on/off | Allow user to enable or disable all alert tones |
| Battery Indicator | Indicates battery charge left |
| Short Message | Allows you to enter the message function menu |
| Zone Toggle | Allows you to enter the zone selection function |
| AD Switch | Selects between the Analog and Digital Modes |
| Contacts | Allow you to enter the Contacts menu |
| Radio Enable | Sends an enable command to a private call contact. |
| Radio Disable | Sends a disable command to a private call contact. |
| Radio Check | Sends a device check command to a private call contact |
| Remote Monitor | Allows you to remotely monitor another radio |
| High/Low Power | Allows user to switch between high and low power |
| Repeater/Talkaround | Allows radio to communicate through a repeater or speak directly to another radio without a repeater. |
| Vox On/Off | Enables and disables the VOX function |
| Nuisance Delete | While scanning, allows you to remove a channel from the scan list. |
| Permanent Monitor | Enables and disables the monitor function. Only works with a long key press |

| | |
|---------------------|--|
| Enhanced Scanning | Pressing this button will allow you to go to the enhanced scanning mode defined by the Enhanced Scanning parameters in the General Settings Page. |
| Enhanced Monitoring | Pressing this button will allow you to go to the enhanced monitoring mode to allow you to receive all conversations on that channel. |
| Enhanced Parameters | Pressing the Enhanced Parameter button will allow you to go directly to a screen that will allow you to set all parameters necessary for a digital or analog call. |
| | |


Note:

For an analog channel, the following keys are useful: Unassigned, Monitor, Backlight Auto On/Off, Keypad Lock, Scan On/Off, All Alert Tone on/off, Battery Indicator, Zone Toggle, High/Low Power, Repeater/Talk Around on/off, Nuisance Delete, Permanent Monitor.

Functions and Operations

Digital channel ()

Contacts

Press the  key to access the contact list. From the contacts, you can access list members, add new contacts or manually dial.

1. **Group Call** ()

After selecting a group contact as shown below, pressing OK will then allow you to select **Details** or **Send Message**. Selecting Details will allow you to see the alias and the ID number for that contact. Selecting Send Message will then allow you to send a new SMS or a predefined SMS



2. Private Call ()

After selecting a private contact as shown below, pressing OK will then allow you to select **Details**, **Call Alert**, **Send Message**, **Device Check**, **Remote Monitor**, **Device Enable**, **Device Disable**, **Edit SMS**, or **Delete**.



- **Details:** Allows you to see the Alias and ID number for the contact selected.
- **Call Alert:** Call alert is used for prompting an individual radio. You are asking them to respond and transmit if communication is available. While receiving a call alert command, the radio will generate alert tone.
- **Send Message:** Allows you to send a new SMS or a predefined SMS.
- **Device Check:** This function checks if the target radio is active without alerting the target radio. When the target radio is active, the screen displays: “target radio has replied”, while if the radio is unavailable, the screen displays: “fail!”
- **Remote Monitor:** Allow a user to send a "Remote Monitor" request to the target radio. If the request is successful, you can enable the microphone of the target radio and monitor its activities. The target radio has to be set to allow the remote monitor command to be decoded.

●**Device enable:** Allow a user to send "Device enable" command to the target radio. If request successful, killed radio will now be operational.

●**Device Disable:** Allow a user to send "Device Disable" command to the target radio. If the target radio is lost or stolen, a user can use this function to disable the radio. The disabled radio will still be able to receive the Device Enable command.

●**Edit Contact:** Modify the ID number or alias of a private call contact. Press "*" key to delete last character entered or press "#" to switch input method. The numeric range for the ID is 1~16776415. The Alias can have up to 16 characters.

●**Delete:** Deletes unwanted contacts from the address list. If private call contact is set as channel Tx Contact or call number on one touch call, the contact will not be deleted.

3. All Call ()

After selecting an all contact as shown below, pressing OK will then allow you to use that contact by pressing the PTT key.



4. Manual Dial

You can manually input the private call number for calling or sending call alert, sending

message, device check, remote monitor, device enable or device disable.



5. New Contact

You can add a private call contact to the contact list. When editing the name, press "*" key to delete, press "#1" to enter special characters, press "#0" to enter a space and use the rest of the keys to enter the alphanumeric characters. The name can be up to 16 characters. Next input number. The number can have a range of 1~16776415. After the private call contact was successfully added, the contacts list will show the new contact.



Scan

1. Scan On/Off

If current channel scan list contains at least 2 channels, at you may enable the Scan On/Off feature. Scanning allows the device to search the scan list connected to the current channel to locate qualified channel for receiving voice. During scanning, the icon "Z" flashes. When activities are detected on a channel, the radio will stay on the channel to receive current activities and the icon "Z" will stop flashing. If you don't want to receive activities on the channel, press the programmed Nuisance Delete key

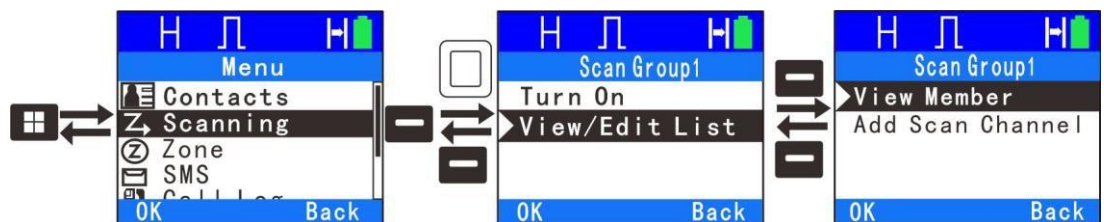
to remove the channel from the scan list temporarily. To exit the scanning process, enter scan menu, switch channel or press the programmed Scan key.



Note: If the channel enables the feature “Auto Scan” via the programming software, switching to that channel will enter scanning automatically. If button 1 or 2 is programmed as Scan on/off, press that button to enable scan feature.

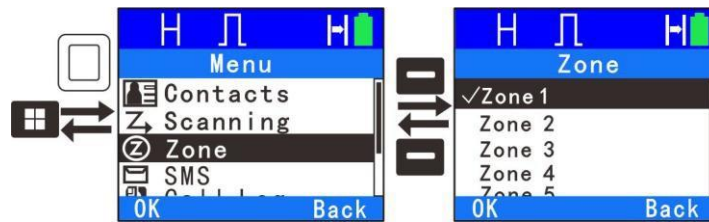
2. View/Edit List

"View/Edit Member" allows a user to view the scan members, delete a member from the scan list or add a member to the scan list. If you add a member, you have to remember the list can contain no more than 16 channels. This feature will not allow you to generate a new scan list or delete an existing scan list. Digital and analog channel can appear in the same scan list.



Zone

The radio supports up to 64 zones and each zone supports 16 channels giving a total of 1024 channel. Enter “Zone” menu to select a desired zone.





Messages

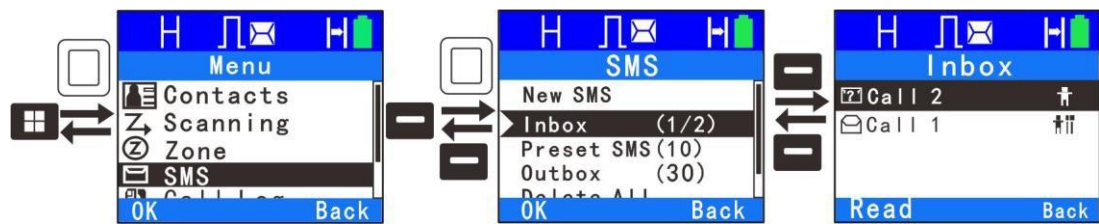
1. New SMS

You can edit desired text message (140 characters at most) and send it to a private call contact or a group call contact. When editing the name, press “*” key to delete, press “#1” to enter special characters, press “#0” to enter a space and use the rest of the keys to enter the alphanumeric characters. Press left or right key to move input cursor. After the message is edited, you can select a contact from the address list which the message is sent to or manually dial a number to send to.



2. Inbox

The Inbox can save up to 30 received messages. In the Inbox the unread message displays:  and the read message displays: . For each message, you can choose to perform any of these operations: Reply, Forward and Delete.





3. Preset SMS

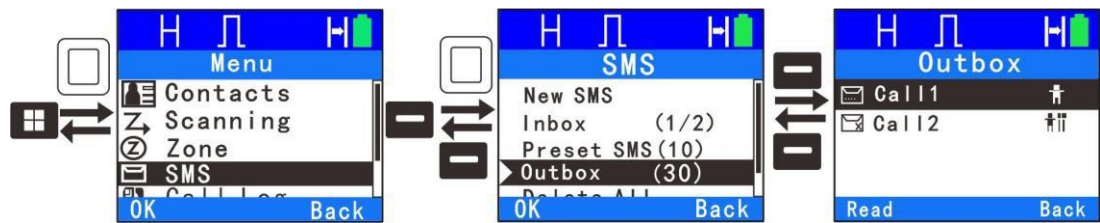
Via programming software, the user can save up to 10 text message entries and each message can contain up to 140 characters. You can choose to edit and send any entry.



Note: Preset text messages also can also be assign to one touch call.
Press the programmed key to send the message.

4. Outbox

With the outbox menu, you can view if the message was sent successfully or failed. The outbox can save up to 30 sent messages. If the sent message is successful it displays  and you can choose to forward or delete it. If sent message unsuccessful, it displays , and you can choose to resend, forward or delete message.



5. Delete All

This function is a convenient way to delete all message on the inbox or outbox. Clear All will delete all messages on Inbox and Outbox at the same time. The preset messages can't be deleted.



Call Logs

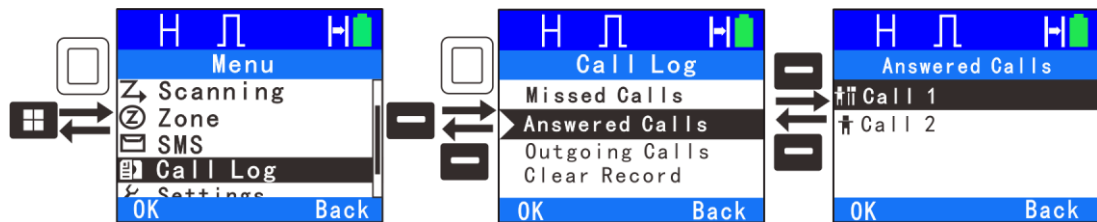
1. Missed Call

The missed calls log can save up to 10 entries. When the memory for call logs is full, the oldest entry will be deleted automatically. You can add the missed call to the contact list or delete it.



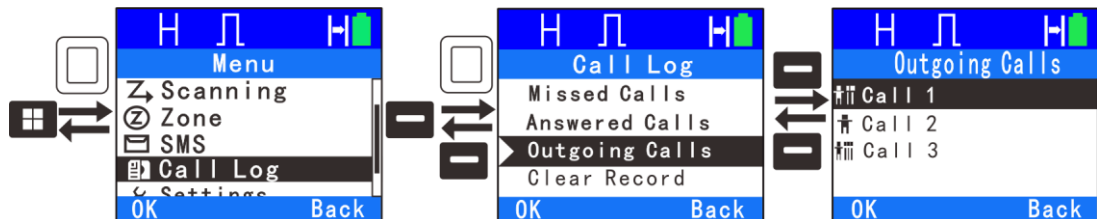
2. Answered Calls

The answered calls log can save up to 10 entries. When the memory for call logs is full, the oldest entry will be deleted automatically. You can add the answered call to the contact list or delete it.



3. Outgoing Calls

The outgoing calls log can save up to 10 entries. When the memory for outgoing call logs is full, the oldest entry will be deleted automatically. You can add the outgoing call to contact list or delete it.



4. Clear Record


This function is convenient to delete Missed call logs Answered call logs or Outgoing call logs, Clear All will delete all call logs at the same time.

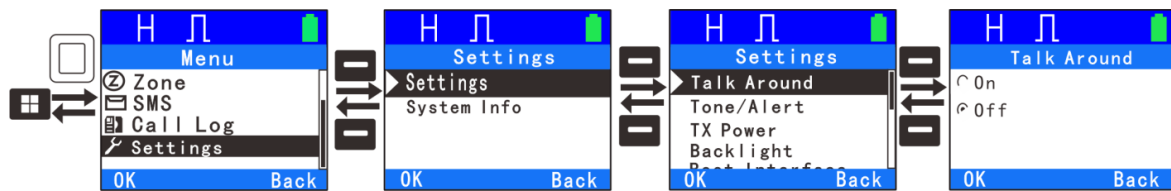


Settings

1. Settings

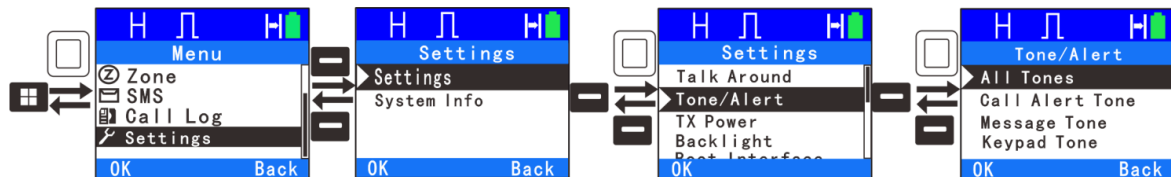
Allow a user to perform basic settings for the two-way radio.

●Talk Around: When your repeater malfunctions or when the radio is out of repeater's range, you can continue to communicate in talk around mode. With the enable talk around feature, the screen displays:  and the TX frequency will be the same as the RX frequency. If the channel is switched, the scan is enabled, or the radio was restarted, the feature will be disabled.

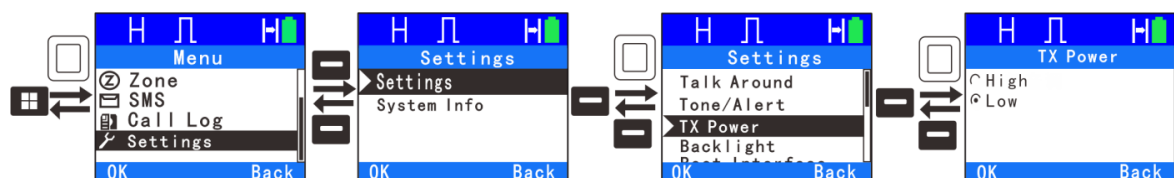


Note : To enable this function, TX frequency should be different from RX frequency, and the channel will set as allow talk around on the programming software.

●Tone/Alerts: To sets alert tones for your radio. Tone alerts include settings of all tones, call alert tone, message tone and keypad tone. If disabled, all alert tones will be off except emergency tone.

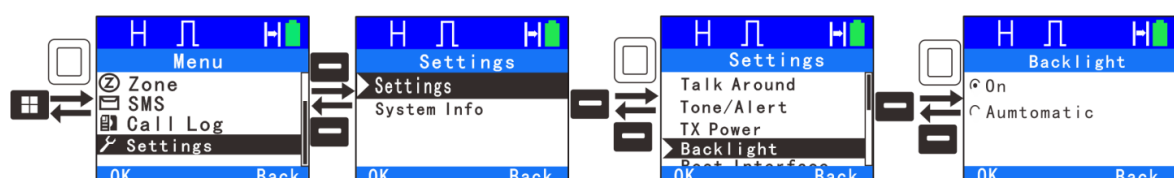


●TX Power : Allow a user to change the power level between high and low indicated by H and L on the display.

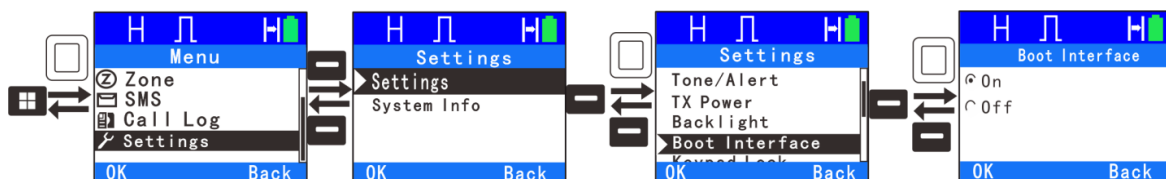



28

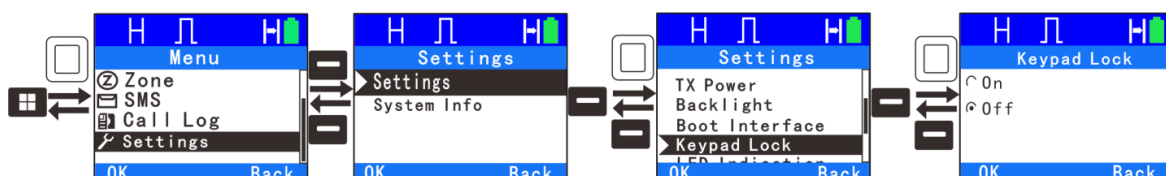
●Backlight: To set the backlight parameters, you can select on or automatic. When you select automatic, the light will stay on for 5 seconds after a key is pressed. If you select on, the light will stay on as long as the power is on.



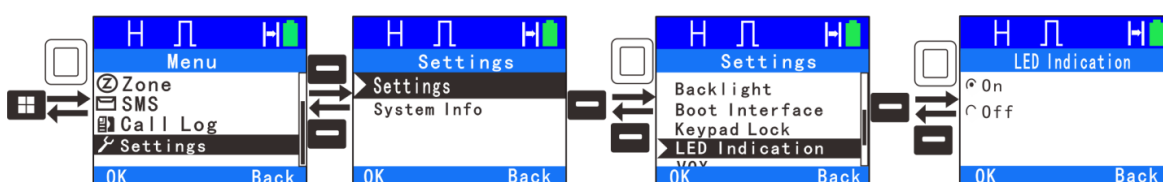
●Boot Interface: Allow a user to enable or disable the introduction screen when the power is first turned on. When the introduction screen is enabled, the display will show the BF Logo and the device name. When the introduction screen is disabled, the screen will only show the device name.




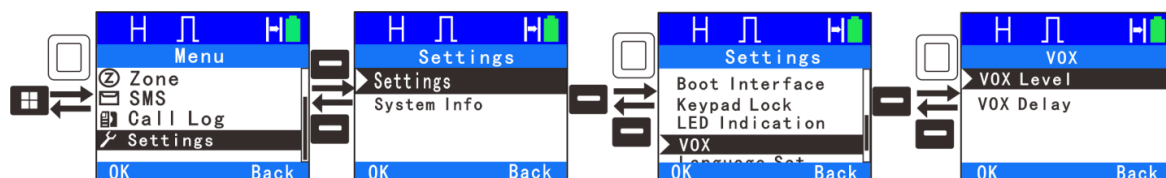
●Keypad Lock: Allow a user to enable or disable the keypad lock via the menu. The Keypad locked is indicated by . When the keyboard is locked, you can only operate the PTT key, button 1 or button 2. Press "MENU" and "##" key to unlock.



●LED indicator: To enable or disable LED indication. While disabled all indicators are turned off including the backlight of the LCD, the Rx Green Indicator, the Tx Red indicator and the Orange Scan indicator. Please use this function with due care because once it is disabled, it is difficult to enable because it is almost impossible to read the screen.

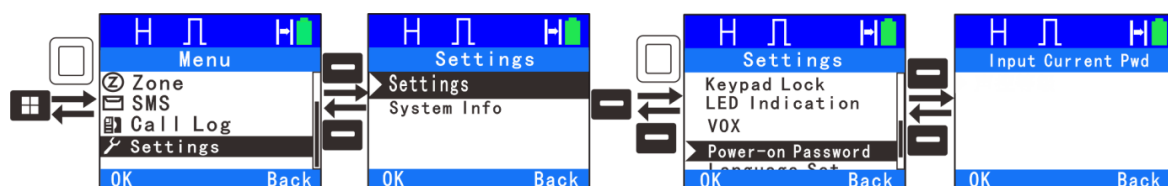


●VOX: While this function is enabled you can enjoy hands-free communication. The radio will automatically begin transmitting when you speak, and terminate transmitting when you stop speaking with no need of PTT press. Allow user to set the VOX level (level 1-8) and VOX delay(0.5~10seconds) via menu. VOX on indicate by : .



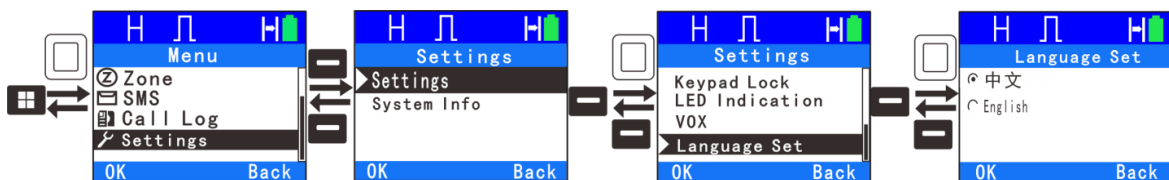
Note: The VOX feature only is used if you are using a supported headphone.

●Power-on Password: If the power-on password feature is enabled via the programming software, you can modify the password by this menu. First you need input old password correctly and then input a new password twice.



Note: This menu is effective if power on password is set via programming software.

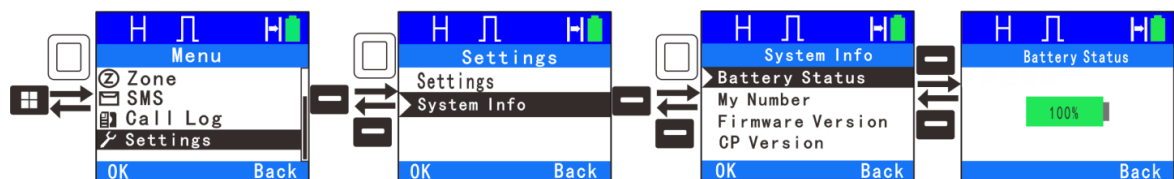
- Language: The radio supports two languages: Chinese and English.



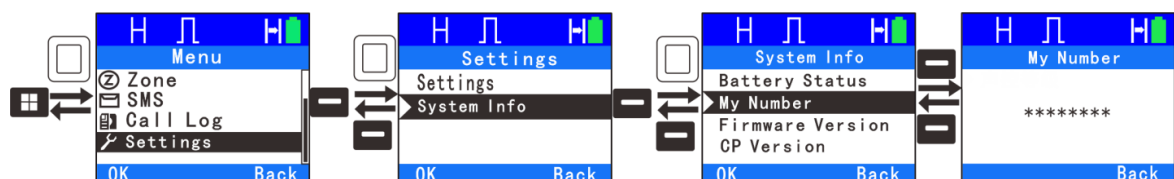
2. System Info

With this option, you can view the basic information of your radio.

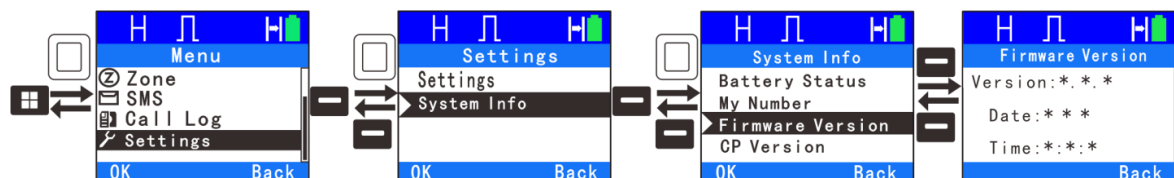
- Battery Status: To view the radio's battery capacity. It's convenient for user to know the battery capacity so they can change or charge the battery before its completely discharged.



- My Number: Allow a user to view the radio ID number, which is same as device ID.



- Firmware version: View firmware version information.



- CP Version: To view CP version information.



Digital Emergency

In case of an emergency you can enter an emergency mode to ask for help.

There are three emergency types and three emergency mode available.

Emergency Type:

Regular: In emergency mode, the radio will give audible and visible indication;

Silent: In emergency mode, the radio won't give any audible or visible indication;

Silent with Voice: In emergency mode, the radio won't give any audible or visible indication, but will receive voice.


Emergency Mode:

Alarm: In this mode, you can send alarm information and expect to get an ACK back. It will do this for the maximum number of retries programmed before it will exit the emergency mode.

Alarm with Call: You can press programmed "Emergency On/Off" key to send emergency information and then press PTT to transmit an emergency call.

Alarm with voice to follow: You can press programmed "Emergency On/Off" key to send emergency information, then you can speak into the microphone, allowing your voice and background noise be transmitted automatically as you do not need to press PTT Key.


Send Emergency Alarm

If the current channel has the emergency system enabled and the current channel is used as the emergency revert channel, pressing the programmed “emergency on/off” key sends alarm information, the LED indicator glows red, and the radio displays icon  as “regular” type.

Exit emergency mode

If the Emergency Type is Regular and in Emergency Alarm mode, the radio will continue to send Alarm messages and stay in the alarm mode until it gets back an ACK or the number of retries sent is at the maximum number programmed. You can also exit the alarm mode by a long press of the Emergency on/off key. If Emergency Type is silent or silent with voice, pressing the PTT key or a long press of the programmed emergency key will exit the emergency mode.

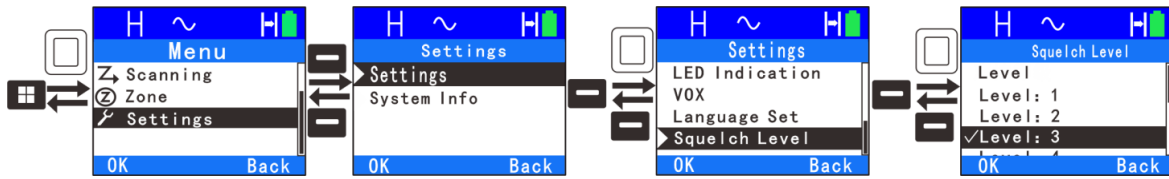
Receive Emergency Information

When the feature “emergency alarm indication” is enabled, if received emergency information, the radio displays icon , the transmitter’s ID and name, an alarm tone will sound. To exit the emergency mode, long press the programmed emergency key.

Analog Channel ()

In analog mode, the radio only supports three basic operations. The first is the scanning, the second is zone and the third is settings. The scan and zone features are the same as in the digital mode. The radio settings is the same as digital except squelch level has been added.

●**Squelch Level:** In the analog mode, this feature allows you to adjust the squelch threshold required for the radio to un-mute. You can set SQL1~9, Level 3 is the default.



CTCSS/CDCSS

In analog channel, you can set unique CTCSS tones or CDCSS codes to guarantee the privacy of your communication. If CTCSS tone or CDCSS code has been set in the current channel, a matching CTCSS tone or CDCSS code is required for the radio to receive an incoming signal. You can select a CTCSS tone from the standard CTCSS tone table or a DCS Code from the standard CDCSS code table.

Set the encode and decode parameters in the Channel screen.

●**Decode:** Only when receiver receives a call containing matching the decode, you can hear the call. If you set it to “None”, then the radio will hear all CTCSS tones and CDCSS Codes with the disadvantage that you will also hear all noise and calls made for someone else.

●**Encode:** Signal that you transmit will only be heard by parties whose CTCSS/CDCSS signaling matches your transceiver.

Note : The radio will accept non-standard CTCSS codes in analog mode.

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Voice Encryption

The voice encryption can encrypt your audio signals to guarantee the privacy of your communication. This feature is setup in the programming software. The user can select encryption type as static or dynamic. If the encrypt feature is enabled, the transmitter and receiver must be set as the same encryption type and same encryption key, otherwise the receiver is muted.

Note: This feature is effective only on digital channel.

Time Out Timer (TOT)

The purpose of TOT is to prevent any user from occupying a channel for an extended period and preventing the radio from overheating. If a channel is busy, the time will be shorter. If the preset time expires, the radio will generate beep

and terminate transmission automatically. With the programming software, you can set TOT between 15-495 seconds.

TX Permission

Digital Channel

This feature called “Admit Criteria” and found on the Channel screen can restrict the channel from transmitting if it is already in use. There are three options available: always, color code free, channel free, if choose always, whenever the PTT key is pressed the radio will transmit. If choose color code free, you will be unable to transmit on the channel if the color code is already in use; If choose channel free, you will be unable to transmit on the channel if it is already in use. If the channel is busy, pressing the PTT key will generate a warning tone.

Analog Channel

This feature called “BCL” (Busy Channel Lockout) and found on the channel screen can restrict the channel from transmitting if it is already in use. There are three options available: off, carrier, CTCSS/CDCSS, if choose Off, whenever the PTT key is pressed the radio will transmit. If choose carrier, you will be unable to transmit on the channel if the channel is being used by others. If choose CTCSS/CDCSS, you will be unable to transmit on the channel if it is already in use and the CTCSS/CDCSS code in use. If the channel is busy, pressing the PTT key will generate a warning tone.

Battery Saver

This function allows an idle radio to enter automatically a battery saver mode. This mode will extend battery service life, but response time may be delayed. You can set battery saver time ratio as : 1:1, 1:2, 1:3 or 1:4 The larger the second number, the more power is saved and the longer the battery will last. This feature is found in General Settings of the programmable software.

Low Battery Warning

When your battery gets low, the LED indicator glows red and a warning message of “Please Charge” will be annunciated. Please replace the battery or charge the battery. The radio will turn off automatically while battery is too low. This feature is found in General Settings of the programmable software.

CTCSS Standard Frequency Table

| CTCSS No. | Fre. [Hz] | CTCSS No. | Fre. [Hz] | CTCSS No. | Fre. [Hz] | CTCSS No. | Fre. [Hz] |
|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 1 | 67.0 | 11 | 94.8 | 21 | 131.8 | 31 | 186.2 |
| 2 | 69.3 | 12 | 97.4 | 22 | 136.5 | 32 | 192.8 |
| 3 | 71.9 | 13 | 100.0 | 23 | 141.3 | 33 | 203.5 |
| 4 | 74.4 | 14 | 103.5 | 24 | 146.2 | 34 | 210.7 |
| 5 | 77.0 | 15 | 107.2 | 25 | 151.4 | 35 | 218.1 |
| 6 | 79.7 | 16 | 110.9 | 26 | 156.7 | 36 | 225.7 |
| 7 | 82.5 | 17 | 114.8 | 27 | 162.2 | 37 | 233.6 |
| 8 | 85.4 | 18 | 118.8 | 28 | 167.9 | 38 | 241.8 |
| 9 | 88.5 | 19 | 123.0 | 29 | 173.8 | 39 | 250.3 |
| 10 | 91.5 | 20 | 127.3 | 30 | 179.9 | | |

CDCSS Standard Code Table

| CDCSS | Positive | Negative | CDCSS | Positive | Negative | CDCSS | Positive | Negative |
|----------|----------|----------|-----------|----------|----------|-----------|----------|----------|
| NO | Code | Code | NO | Code | Code | NO | Code | Code |
| 1 | D023N | D023I | 29 | D174N | D174I | 57 | D445N | D445I |
| 2 | D025N | D025I | 30 | D205N | D205I | 58 | D464N | D464N |
| 3 | D026N | D026I | 31 | D223N | D223I | 59 | D465N | D465N |

| | | | | | | | | |
|-----------|-------|-------|-----------|-------|-------|-----------|-------|-------|
| 4 | D031N | D031I | 32 | D226N | D226I | 60 | D466N | D466I |
| 5 | D032N | D032I | 33 | D243N | D243I | 61 | D503N | D503I |
| 6 | D043N | D043I | 34 | D244N | D244I | 62 | D506N | D506I |
| 7 | D047N | D047I | 35 | D245N | D245I | 63 | D516N | D516I |
| 8 | D051N | D051I | 36 | D251N | D251I | 64 | D532N | D532I |
| 9 | D054N | D054I | 37 | D261N | D261I | 65 | D546N | D546I |
| 10 | D065N | D065I | 38 | D263N | D263I | 66 | D565N | D565I |
| 11 | D071N | D071I | 39 | D265N | D265I | 67 | D606N | D606I |
| 12 | D072N | D072I | 40 | D271N | D271I | 68 | D612N | D612I |
| 13 | D073N | D073I | 41 | D306N | D306I | 69 | D624N | D624I |
| 14 | D074N | D074I | 42 | D311N | D311I | 70 | D627N | D627I |
| 15 | D114N | D114I | 43 | D315N | D315I | 71 | D631N | D631I |
| 16 | D115N | D115I | 44 | D331N | D331I | 72 | D632N | D632I |
| 17 | D116N | D116I | 45 | D343N | D343I | 73 | D654N | D654I |
| 18 | D125N | D125I | 46 | D346N | D346I | 74 | D662N | D662I |
| 19 | D131N | D131I | 47 | D351N | D351I | 75 | D664N | D664I |
| 20 | D132N | D132I | 48 | D364N | D364I | 76 | D703N | D703I |
| 21 | D134N | D134I | 49 | D365N | D365I | 77 | D712N | D712I |
| 22 | D143N | D143I | 50 | D371N | D371I | 78 | D723N | D723I |

| | | | | | | | | |
|-----------|-------|-------|-----------|-------|-------|-----------|-------|-------|
| 23 | D152N | D152I | 51 | D411N | D411I | 79 | D731N | D731N |
| 24 | D155N | D155I | 52 | D412N | D412I | 80 | D732N | D732N |
| 25 | D156N | D156I | 53 | D413N | D413I | 81 | D734N | D734I |

| | | | | | | | | |
|-----------|-------|-------|-----------|-------|-------|-----------|-------|-------|
| 26 | D162N | D162I | 54 | D423N | D423I | 82 | D743N | D743I |
| 27 | D165N | D165I | 55 | D431N | D431I | 83 | D754N | D754I |
| 28 | D172N | D172I | 56 | D432N | D432I | | | |

Specifications

| General | |
|-------------------------|--|
| Frequency range | UHF:400-480MHz/450-520MHz/350-390MHz |
| Channel Capacity | 1024 |
| Zones | 64 |
| Channel Spacing | 12.5KHz/25KHz |
| Operating Voltage | DC 7.4V(±20%) |
| Battery capacity | 1800 mAh |
| Battery Life (5/5/90) | High TX Power: Digital 16 hours; Analog 12 hours Power Save Mode: Digital 20 hours; Analog 16 hours |
| Frequency Stability | ±1.5ppm |
| Antenna Impedance | 50Ω |
| Dimensions (L×W×H) | 56 (L) * 32(W)* 109 (H)mm |
| Weight | 239g(include battery) |
| Transmitter | |
| RF Output Power | High Power : 4.5W Low Power : 1.0W |
| 4FSK Modulation | 12.5kHz only data : 7K60FXD 12.5kHz data and audio : 7K60FXE |
| FM Modulation | 12.5 kHz : 8K50F3E ; 25 kHz : 16KΦF3E ; |

| | |
|-------------------------------------|---|
| Modulation Limiting | +/- 2.5kHz @ 12.5kHz; +/- 5kHz @ 25kHz |
| FM Noise | -40dB |
| Conducted Emission | -36 dBm≤1GHz/-30 dBm≥1GHz |
| Adjacent Channel Power | ≤-60dB |
| Audio Response | +1/-3 dB |
| Audio Distortion | 3% |
| Digital Voice coder Type | AMBE+2™ |
| Receiver | |
| Digital Sensitivity | 5% BER : 0.25 uV |
| Analog Sensitivity | 0.25 uV (12 dB SINAD) |
| Intermodulation | 60dB |
| Adjacent Channel Selectivity | 60 dB |
| Spurious Response Rejection | 60 dB |
| FM Noise | -40dB |
| Audio Response | +1/-3 dB |
| Audio output power | 1.5W |
| Audio Distortion | 3% (Typical) |
| Conducted Spurious Emission | -57dBm |
| Environmental Specifications | |
| Operating Temperature | -20℃—+60℃ |
| Storage Temperature | -30℃—+85℃ |

| | |
|------------------------|-----------------------------|
| Humidity | MIL-STD-810C/D/E/F Standard |
| Vibration & Shock | MIL-STD-810C/D/E/F Standard |
| Dustproof & waterproof | IP54 |

Statement

Our Company tries to make an accurate and complete manual. If you have any question, you can contact us and we will give you an answer. All the above specifications and designs are subject to change without prior notice due to continuous development.

Summary of Radio Menu Functions

Contacts

List

Group contacts

Details

Send Message

New SMS

Preset SMS

Private contacts

Details

Call Alert

Send Message

New SMS

Preset SMS

Device Check

Remote Monitor

Device Enable

Device Disable

Edit SMS

Delete

Manual Dial

New Contact

Scanning

Turn On/Off

View/Edit List

View/Delete Member

Add Scan Channel

Zone

SMS

New SMS

Inbox

Preset SMS

Outbox

Delete All

In Box Delete

Outbox Delete

Delete All

Call Log

Missed Calls

Answered Calls

Outgoing Call

Clear Record

Settings

Settings

Talk Around

Tone/Alert

All Tones

Call Alert Tone

Message Tone

Keypad Tone

Tx Power

Backlight

Boot Interface

Keypad Lock

Led Indication

VOX

VOX Level

VOX Delay

Language Set

Squelch Level (Not currently available)

Device ID

System Info

Battery Status

Firmware Version

CP Version

Enhanced Scanning

The radio allows you to set the following parameters for scanning:

Type: The radio can be set to scan either Digital channels or Analog Channels. The type is set by the channel you are on. If you are on an analog channel it will only scan analog channels. If you are on a digital channel, you will only scan digital channels.

Min Frequency: This is the frequency the radio starts scanning. Scanning is from the minimum frequency to the maximum frequency. We will set the default in the UHF version to 420 MHz and the VHF version to 144 MHz.

Max Frequency: This is the frequency it stops scanning. We will set the default in the UHF version to 450 MHz and the VHF version to 147.99 MHz.

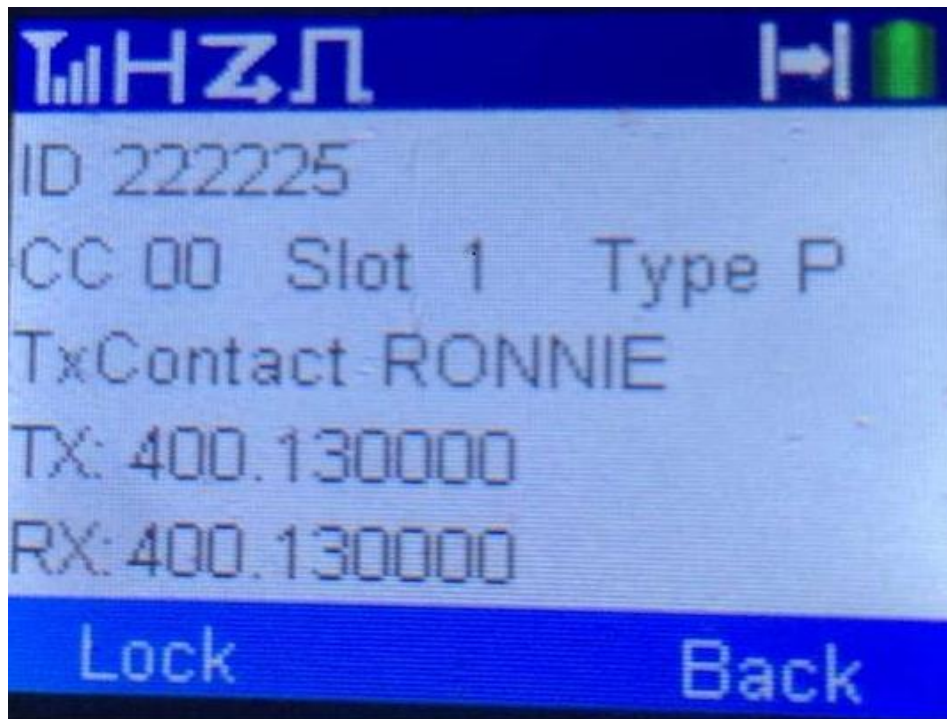
Channel Spacing. This is the spacing between channels. In HF radios there is often continuous tuning. At the VHF and UHF bands, the tuning is channelized because the hardware is designed to only work with either 12.5 KHz spacing or 25KHz spacing. We set the default in this radio to 12.5 KHz.

Enhanced Scanning Button: This defines which button is used to start the scanning mode. We set the default to the top button and quick press.

To start the Enhanced scanning mode, press the appropriate button and you will get a screen on the radio as shown below.

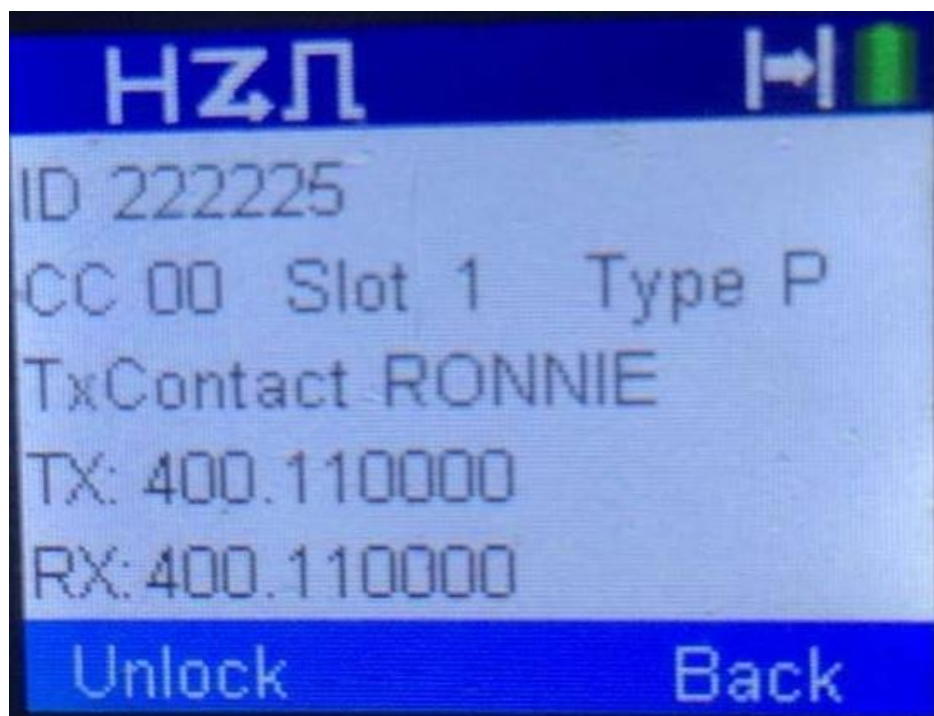


When it gets to an active channel, the display will show as follows for a digital signal.



To lock in that information, press the lock soft key just below the lock prompt on the display. This will now allow you to quickly get on the air by just pressing the PTT key. The Tx frequency is determined by the Rx to Tx Offset parameter in the CPS.

Once the Lock key is pressed, the following screen will appear.



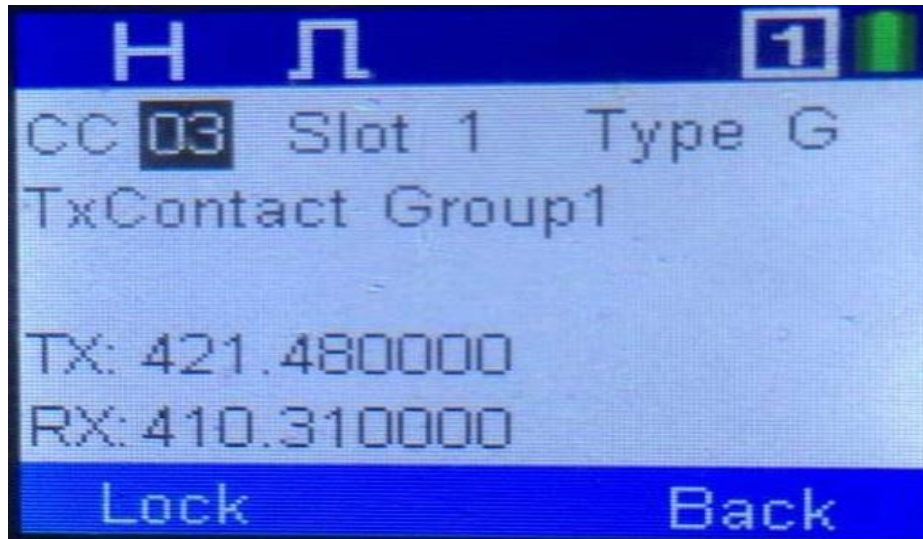
To scan to the next frequency, press the Unlock softkey.

ENHANCED PARAMETERS

The radio allows you to set the following parameters for Enhanced Parameters:

Enhanced Parameters Button: This defines which button is used to start the enhanced parameter mode. We set the default to the bottom button and quick press.

To start the Enhanced Parameter mode, press the appropriate button and you will get a screen on the radio as shown below if your radio was on a digital channel.



To navigate to the different parameters, you use the left and right selection keys. Once you are on the parameter you either use the up and down selection keys or the numeric keypad to enter the data, depending on which parameter you want to change.

The CC is changed with the selection key. The minimum value is 0 and the maximum value is 15

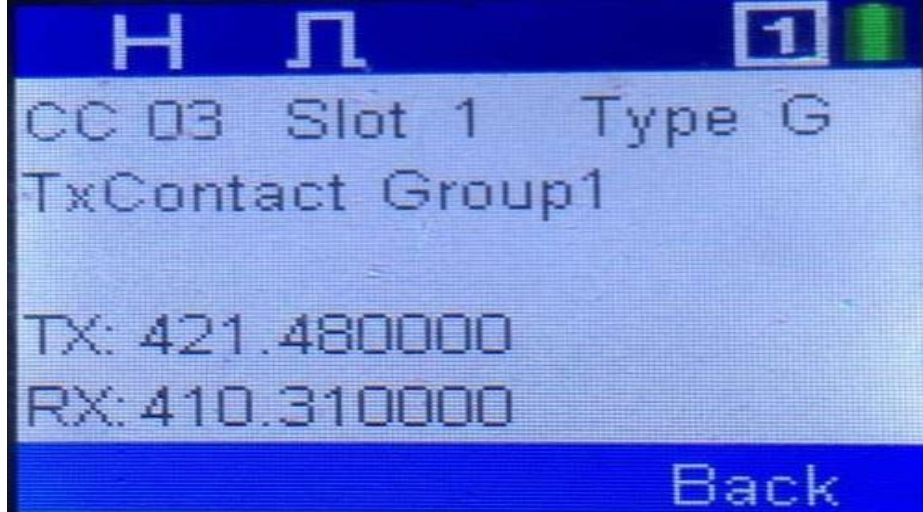
The Slot is changed with the selection key. Your choice is Slot 1 or Slot 2.

The Type could be selected as P, G, A, or N. standing for private, group, All, or None respectively. The selection key is used for selecting your choice.

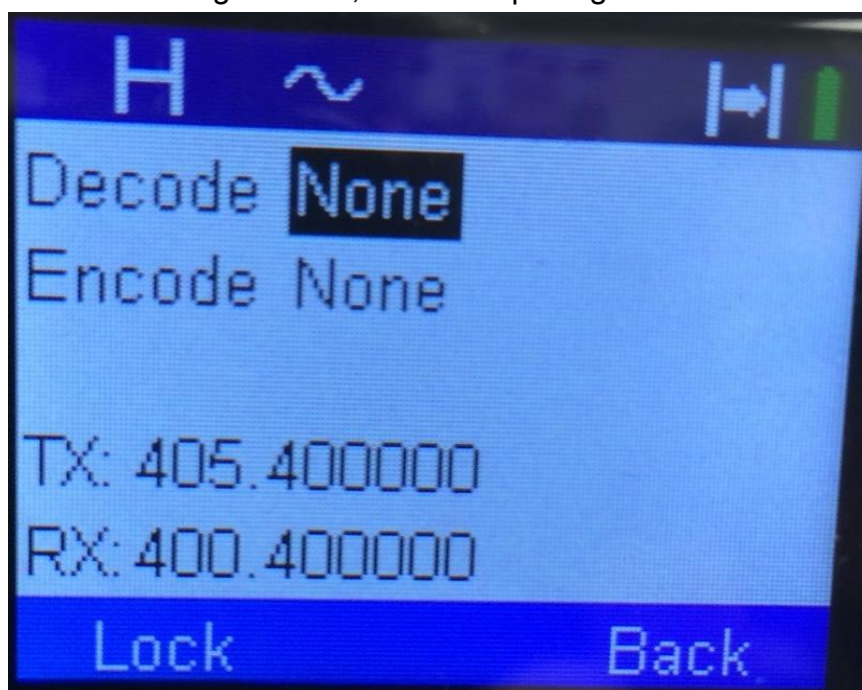
The TxContact is entered with the Numeric keypad

The Tx and Rx frequencies are entered with a direct entry by the numeric keypad.

Once you changed the information as necessary you then press the Lock softkey and the information is ready to use on the air. After the lock softkey is pressed the following screen appears.



If your radio was on an analog channel, then the opening screen would be as follows:



You use the up and down selection key to select the different CTCSS or DCS parameters in the Decode and Encode fields.

The starting screen for the enhanced parameters should be as follows:

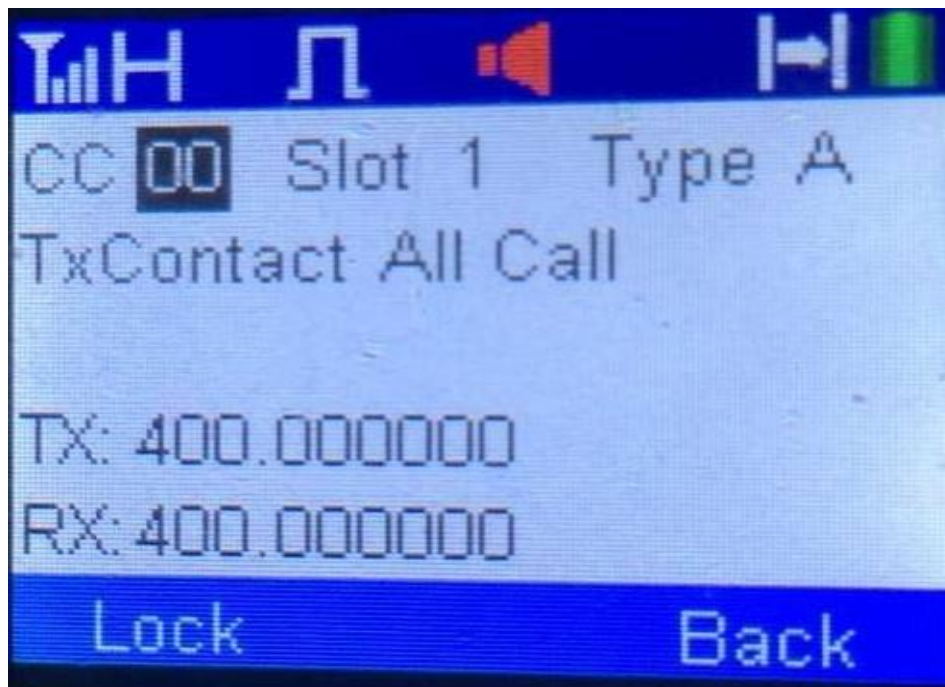
1. If you change the channel switch or you first turn on power, the screen should be whatever is associated with the channel.
2. If you locked in enhanced scanning, then whatever was used in scanning should be on this screen.
3. If you locked in Enhanced Monitor, then whatever was used in enhanced monitor should be on this screen.
4. If you locked in Enhanced Parameter, then whatever was used in enhanced parameter should be on this screen.

ENHANCED MONITOR

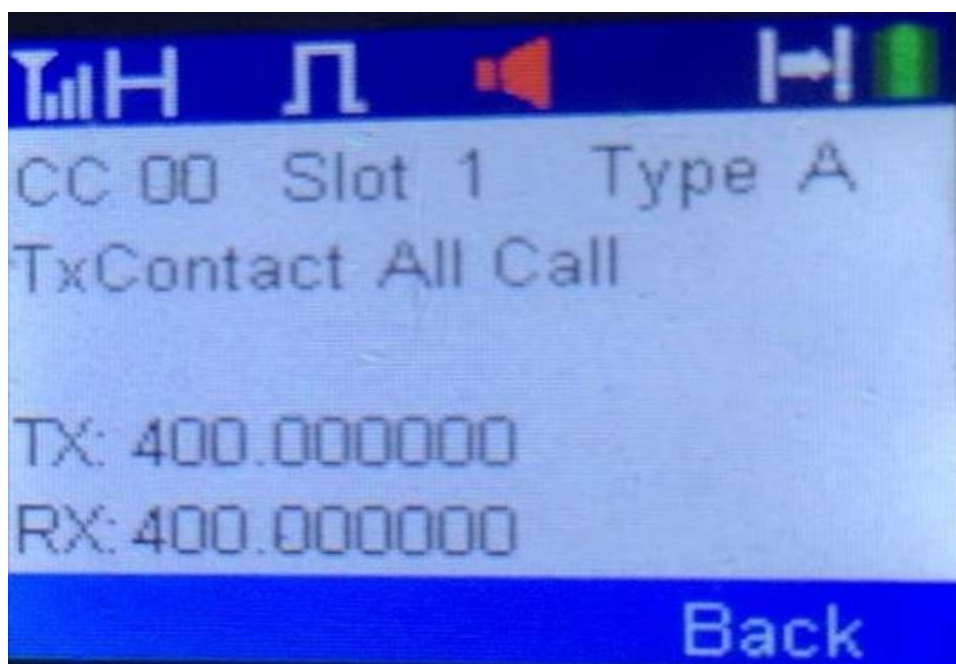
The radio allows you to set the following parameters for Enhanced monitor:

Enhanced Monitor Button: This defines which button is used to start the enhanced monitor mode. We set the default to the top button and long press.

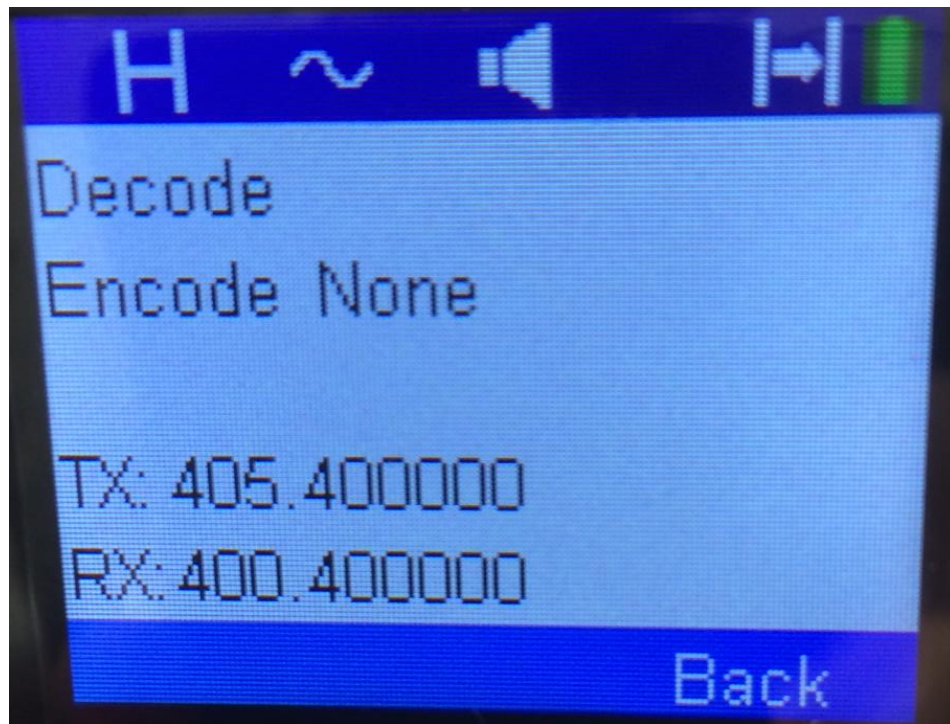
To start the Enhanced Monitor mode, press the appropriate button and you will get a screen on the radio as shown below if your radio was set to a digital channel.



If you hear a conversation you like on that channel press the lock key and you are now ready to use the radio. After you press the lock key you will get the following screen:



If your radio was on an analog channel and you entered the enhanced monitor mode, you would get the following screen.



Finding Key Parameters

So you got a radio and now you want to know where you can find the various parameters to set up the radio.

The first place to find analog and digital repeaters is a website called www.repeaterbook.com. That will show all the repeaters in the world. Note that many of the repeaters are closed and they do not want outsiders using them.

However if you only want DMR repeaters then go to www.dmr-marc.net or www.cqdmrmap.com/. This last one is interesting because the map shows which network the different repeaters are on.

There is a standard for UHF repeaters in that the receive frequency is always 5 MHz from the transmit frequency. There is no agreement in the amateur community if the transmit frequency is greater than the receive frequency or the transmit frequency is less than the receive frequency.

There is no agreement on color codes but most repeaters have set the color code to 1.