Appendix I: User Manual

Please refer to the following pages.

SENTINEL Mesh Handset

FAP6210-001

User Manual

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1.0 *SENTINEL* MESH HANDSET OVERVIEW

The *SENTINEL* Mesh Handset is an all-in-one portable device providing voice communications, text messaging, and personnel tracking within Innovative Wireless Technologies' (IWT) ad-hoc wireless digital mesh network. The intrinsically safe, push-to-talk (PTT) two-way handset provides high-quality voice communications at a range of up to 2500 feet in radio frequency (RF) challenged and noisy settings.

Primarily designed for ease of use in underground mining environments, the *SENTINEL* Mesh Handset has all the features you would expect in a public safety handset: individual, group and broadcast calling modes, handset-to-handset mode, and 48-character free-form text messaging as well as up to 10 pre-configured text messages. It features a large, easy-to-read LCD display, large menu navigation buttons, a preemptive emergency button, rotary on/off/volume and channel-select knobs and a rechargeable, high-capacity lithium-ion battery. The sturdy mechanical package provides high performance in a rugged, dust-tight and waterproof package that has been environmentally tested for reliability.

Key features of the *SENTINEL* Mesh Handset:

- Voice, text and tracking – all in one device
- State-of-the-art digital voice technology for clear communications
- High reliability communications in underground environments up to a range of 2500 feet
- Supports handset-to-handset mode and forwarding/support for extended network range
- Free-form and user pre-programmed text messages
- 7 group channels and 1 broadcast channel for both network and handset-to-handset mode
- More than 24 hours battery life
- FCC compliant for above ground operation
- Automatic power adjustment for above and below ground use
- Intrinsically safe when equipped with IS battery pack
- Mine Safety and Health Administration (MSHA) approved

2.0 SAFETY INFORMATION

IMPORTANT! READ BEFORE USING THE *SENTINEL* MESH HANDSET.

This section contains important information on the safe operation of the *SENTINEL* MESH HANDSET.

2.1 RADIO FREQUENCY (RF) EXPOSURE

2.1.1 Part 15 of Federal Communications Commission (FCC) Rules Compliance

This device complies with Part 15 of 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.

FCC ID: SP8-FAP6210001

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage, et
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

IC: 9568A-FAP6210001

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate RF energy which may cause harmful interference to radio communications if not installed and used in accordance with the instructions. It is important to note that proper installation does not guarantee interference will not occur. 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; or
- consult the dealer or an experienced radio/TV technician for help.

2.1.2 FCC Allowable Limits for General RF Exposure

CAUTION! To ensure that exposure to RF electromagnetic energy is within the FCC allowable limits for general RF exposure, always adhere to the following guidelines:

- Do not operate the radio without a proper antenna attached as this may damage the radio and may also cause the FCC RF exposure limits to be exceeded. A proper antenna is the antenna supplied with this radio by IWT (Antenna Factor: ANT-916-CW-HD) or an antenna specifically authorized by IWT for use with this radio.

- Only use IWT-authorized accessories such as antennas, batteries, belt clips, speakers and microphones. Use of unauthorized accessories may cause the FCC Occupational/Controlled Exposure RF compliance requirements to be exceeded. See the document **Conditions of Use for *SENTINEL* Mesh Handset** (Doc. Num. 6650-12-0006) for a list of approved items.

2.1.3 Specific Absorption Rate (SAR)

READ THIS INFORMATION BEFORE OPERATING YOUR RADIO.

The statements below contain important safety information regarding Specific Absorption Rate (SAR) and RF exposure limits included in United States and international standards.

This portable radio generates RF electromagnetic energy during transmit mode. This device has been shown to be compliant for localized SAR for controlled environment limits specified in ANSI/IEEE Std. C95.1-1992 and has been tested in accordance with the measurement procedures specified in IEEE 1528-2003, OET Bulletin 65 Supp. C, RSS-102 and Safety Code 6.

2.2 MSHA APPROVAL

This device has been evaluated by MSHA per Title 30 Code of Federal Regulations Part 23.

MSHA Approval Number: 23-A12xxxx-0

Per MSHA's evaluation, this product has been determined to be intrinsically safe under certain conditions of use. See the document **Conditions of Use for *SENTINEL* Mesh Handset** (Doc. Num. 6650-12-0006).

2.3 PROXIMITY TO BLASTING COMPONENTS

The transmitted waveform characteristics of the *SENTINEL* Mesh Handset are short duration (milliseconds/second) pulses, with a power level of one (1) Watt or less. For this reason, the energy density is low such that the handset is classified as a low Power RF source as defined by the Institute of Makers of Explosives, Safety Library Publication No. 20.

The Handset shall not be turned on or operated within 3.3 feet of explosives or blasting components.

2.4 MODIFICATIONS

Changes or modifications to this Mesh Handset not expressly approved by Innovative Wireless Technologies, Inc., may void the user's authority to operate this equipment.

The handset automatically detects the mesh network and adjusts its frequency and power as directed by the network. The user cannot change any aspects of the RF operation of the handset.

3.0 SPECIFICATIONS FOR FAP6210-001

(Typical unless otherwise specified)

Environmental	
Operating Temperature[1]	-30C to +60C
Storage Temperature	-40C to +80C
Operating Humidity	0% to 100% non-condensing
Dimensions (includes battery; does not include antenna)	6.44" x 2.63" x 1.79" (H x W x D)
Weight (with battery)	13.5 oz
Enclosure	IP67 (when assembled with antenna and IS battery pack)

Electrical	
Frequency Range	902 – 928 MHz
Receiver Sensitivity[2]	-100 dBm
RF Transmit Power (below ground)	+28 dBm
RF Transmit Power (above ground)	+13 dBm
RF input/output[3]	50 ohms nominal (RP-SMA Connector)
IS Battery pack	Lithium Ion
Nominal Voltage	7.4V
Battery Life (5/5/90 usage model)	28 hours

Note 1: Ambient temperature
Note 2: Conducted sensitivity measured at BER <2%
Note 3: Only use IWT-approved antenna

4.0 GETTING STARTED

To begin using the Mesh Handset, review the information below covering the basic information you need to know to get started.

4.1 ASSEMBLING THE MESH HANDSET

The Mesh Handset is shipped unassembled. Inside the box, you will find these parts:

- Lithium-ion battery pack
- Antenna
- Belt clip
- Handset base

To assemble the Mesh Handset:

- **Attach antenna**
  Remove the antenna and the handset base from the packaging. Take the antenna and attach it to the screw protruding from the top back left corner of the handset base. **IMPORTANT: THE ANTENNA MUST BE ATTACHED TO THE HANDSET BEFORE THE BATTERY PACK IS INSTALLED. NEVER REMOVE THE ANTENNA WITH THE BATTERY PACK STILL ATTACHED. This will prevent any possible damage to the internal circuitry.**

- **Attach battery pack**
  Once the antenna is attached, the battery pack can be attached to the handset base. To do so, remove battery pack from packaging. Insert the two plastic tabs at the bottom of the battery pack into the slots at the bottom of the handset base. Then depress the tab at top of the battery pack and hold while gently pushing the battery pack and handset together until an audible click is heard.

- **Attach belt clip**
  Attach the belt clip after attaching the battery pack. To attach the belt clip:
  - Take clip out of packaging.
  - The clip has a long piece in front and a small piece in back. Squeeze these two pieces together at the top.
  - Looking at the back of the clip, align the sides with the two slots on the back of the battery pack.
  - Slide down fully until clip snaps in place.

  To remove the clip:
  - There is a silver tab on the back of the clip in the middle. Reach behind tab and push forward toward front of clip. Slide the clip up and off the battery pack.

- **Charge battery**
  Once assembled, the handset must be fully charged before using. Single bay and six-bay chargers are available to charge the Mesh Handset. To charge the handset:
  - Plug the charger into a power source.
  - Turn the handset off.
  - Set handset into charger.
  - The Charging status LED will be amber while the battery is charging.
  - When the battery is fully charged, the Charging LED will turn off. The Ready LED will turn green.
  - When powered on, the handset's LED status will also be green to indicate it is fully charged.

Note: The battery pack can be expected to have at least 24 hours of battery life when charged.

4.2 GETTING TO KNOW THE MESH HANDSET

The Mesh Handset is used to make and receive voice calls, send and receive text messages and send and receive emergency notifications. The handset also allows the dispatcher to track personnel underground.

Take a few moments to familiarize yourself with the different parts and features of your new handset before using (see Figure 1).

***SENTINEL* Mesh Handset**
Front View

Figure 1

4.2.1 Turning on the Mesh Handset

The Mesh Handset is powered on using the Volume/Power knob located on the top right of the handset (see Figure 1 above). To turn the handset on, turn the Volume/Power knob clockwise. There will be resistance and an audible click. Once the handset is powered on, it will take a few seconds to boot before showing the Home menu (see Section 4.2.3).

To turn off the handset, rotate the knob counterclockwise until you feel resistance and hear an audible click.

4.2.2 Features

Below is a description of the different features you will find on the Mesh Handset. To locate these features on the handset, see Figure 1.

Volume/Power knob
The Volume/Power knob is located on the top right of the Mesh Handset. Rotating clockwise will first turn on the handset and then increase the volume. Rotating counterclockwise will lower the volume and turn off the Mesh Handset. You will hear an audible click when the knob has turned the handset on as well as when the knob has been turned to the off position.

Group Select knob
The Group Select knob is located on the top middle of the handset. The knob is used to select the 7 different group channels for communications. This knob is also used to select the broadcast channel which is used to address everyone on the network at once. See section 5.2 for more information.

Emergency button
The Emergency button is located on the top left of the handset in front of the antenna. To declare an emergency, press the Emergency button for three seconds and then press the PTT button. See Section 7.0 for more information.

LED status light
Located on the top of the handset in the front right corner, the LED status light uses four different patterns to indicate handset status.

- Fast red blink = Emergency mode
- Quick double green blink = Unread text messages
- Slow single green blink = Normal operation
- Slow single amber blink = Low battery

Home button
The Home button is a small button located on the left side of the handset near the top. Pressing the Home button will return you to the Home menu from any sub menu. When back at the Home menu, pressing the Home button again will reset the destination to the Group channel currently selected. See section 4.2.3 for more information.

Network Signal Meter button
The Network Signal Meter button is a small button located on the left side of the handset under the Home button and above the PTT button. Press and hold the button to receive a numerical value indicating current network signal strength called a Received Signal Strength Indication (RSSI). RSSI is depicted as a negative number (i.e. – 70 dBm) that decreases the farther away the handset gets from the network.

Push-To-Talk (PTT) button
The Push-To-Talk (PTT) button is the large button located on the left side of the handset. To place a voice call to the selected call destination, press and hold the PTT button and speak into the microphone. The button must be released in order to hear any responses. To respond to a call, simply hold the PTT button down and speak into the microphone.

Microphone
The microphone is located just above the left side of the display on the front of the Mesh Handset. When making a voice call, make sure the microphone is level with your mouth.

Display
The display is located on the middle front of the handset. Look to the display to view status indicators, menus, text messages and your calling destination.

Menu Select Keys
Four Menu Select keys can be found below the display. Pressing these buttons activates the menu function located above them on the display. The four keys are:

- Diamond (◆)
- Up Triangle (▲)
- Down Triangle (▼)
- Square (■)

Keypad
The Keypad is located on the lower front of the handset below the Menu Select Keys. The alphanumeric keypad is used for writing text messages and inputting call and text destinations.

Accessory Connector
The Accessory Connector is located on the right side of the handset and is used to connect optional accessories such as an external speaker microphone. Always make sure the connector is covered when not in use. Use only IWT-approved accessories. Using unapproved accessories may result in a non-intrinsically safe condition, unauthorized RF emissions, and may void the warranty. **Do not install or remove accessories while below ground.**

Audible alerts
The handset uses audible alerts to indicate different events:

- Single short, high pitch tone = Emergency button activated
- Single long, high pitch tone = Received automatic emergency acknowledgement from dispatcher
- Single short, low pitch tone = Call did not go through: busy or out of range
- Double short, high pitch tone (played after 60 seconds, then every 4 minutes) = Out of network
- Double short, moderate pitch tone = Text received
- Triple short, moderate pitch tone = Individual voice call received
- Triple short, low pitch tone (played every 5 minutes) = Low battery

4.2.3 Home menu

When the Mesh Handset is first powered on, the Home menu will be displayed (see Figure 2).

The top of the display will show icons indicating the status of various handset functions (see Section 4.2.4).

The middle of the display shows the current call destination. Pushing the PTT button will place a call to the destination shown. The calling destination may be changed by using the Group Select knob or choosing a different destination using the Menu Select keys (see Section 5.0).

Several menu options are available at the bottom of the Home menu:

Inf – Information menu displays Handset ID
Dsp – Changes call destination to dispatcher
Ind – Changes call destination to individual handset
Txt – Text Message menu offers options to read and send text messages

Pushing the Home button will always return you to the Home menu. When back at the Home menu, pressing the Home button again will reset the destination to the Group channel currently selected.

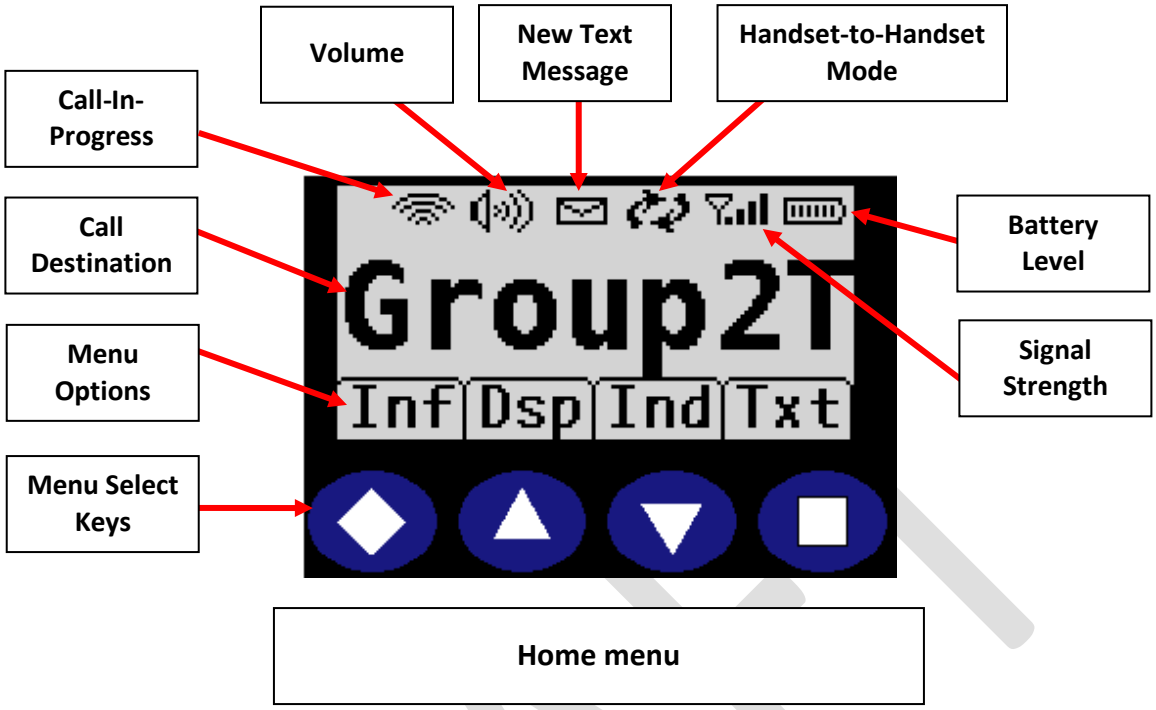


Figure 1

4.2.4 Status Icons

The top of the display shows current status icons.

Volume

The Volume icon is only active when changing the volume using the Volume/Power knob. Crescents appear to the right to indicate increased volume and disappear to indicate decreased volume. The icon becomes hidden a few seconds after the volume adjustment is complete.

New Text Message

The New Text Message icon is displayed for unread text messages. Reading or deleting messages will cause the icon to become hidden. If the mailbox is full, the envelope will change to a black box with an envelope outlined in white. For more on text messaging, see Section 6.0 for more information.

Handset-to-Handset Mode

When out of range of the network, the Handset-to-Handset Mode icon is displayed. Calls placed will only be received by handsets directly within range. Calls will not be received by the network or more distant handsets. Text messages cannot be sent or received when in handset-to-handset mode.

Battery Level

The Battery Level icon shows the remaining battery life. The number of bars shown indicates battery strength. If the battery is too low, the handset will automatically shut down to protect the battery from damage.

Signal Strength

The Signal Strength icon shows the strength of the current connection to the network. An **x** next to the antenna symbol indicates that the handset is not within range of the network. While within range of the network, up to four bars will be shown. More bars represent a stronger connection.

Call-In-Progress

The Call-In-Progress icon indicates the handset is currently accessing the network for a voice call. If the call does not go through successfully, a slash will appear through the icon.

Forward/Support mode

Handsets out of network range can still access the network by connecting with nearby handsets that are on the network using Forward/Support mode. When an out-of-range handset detects a handset nearby on the network, an **F** will appear among the status icons to indicate Forward mode. This means that the out-of-range handset can transmit voice calls and texts to the network using the networked handset as a connection to the network. If an out-of-range handset is using your handset to connect to the network, an **S** will appear among the status icons at the top of the display to indicate Support mode.

F

S

Emergency

The Emergency icon indicates that either the handset has been placed in emergency mode using the Emergency button or an emergency has been declared on the network. See Section 7.0 for more information.

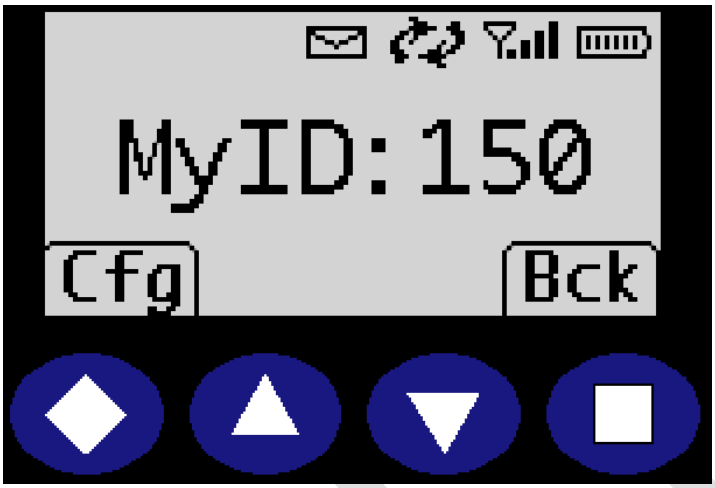
4.3 FINDING YOUR ID

Each handset has a unique ID number. You can call or text a specific individual by using their ID number. The ID number is also used by the dispatcher to track personnel.

Use the Information menu option to find your ID number:

- Go to the Home menu (see Figure 2)
- Select the **Inf** menu option by pressing the *diamond* (◆) Menu Select key located under the display
- The handset's ID will be shown on the display (see Figure 3)
- Press the *square* (■) Menu Select key to return to the Home menu (If no selection is made, the handset will automatically return to the Home menu after displaying the ID number for a few seconds.)

Note: The Information menu has an option labeled **Cfg**. Selecting this option will show the version of radio firmware used by the handset.



Information Menu

Figure 2

5.0 MAKING AND RECEIVING CALLS

Several voice call options are available when using the Mesh Handset. Each calling option is described in more detail in sections 5.1-5.4.

- Broadcast calls will be heard by all handsets on the entire network (see Section 5.1)
- Group (**Grp**) calls are sent to just a selected group of handsets (see Section 5.2)
- An Individual call (**Ind**) is sent to one specific handset (see Section 5.3)
- Dispatcher (**Dsp**) calls go directly to the dispatcher (see Section 5.4)

When in the Home menu, the currently selected Group will be displayed (see Figure 2). You can select a different destination by using the *triangle* (▲) (▼) keys to select **Ind** or **Dsp** or by using the Group Select knob (see sections 5.1-5.4 for more details).

There are two types of calls that can be made using the Mesh Handset:

- **Network calls** - Network calls can be received by any handset within range of the mesh network.
- **Handset-to-handset calls** - Handset-to-handset calls can be made when outside the range of the network. These calls are received only by handsets within direct range of the caller. Handset-to-handset calls do not use or require the mesh network. **Note:** If the handset goes out of range of the network, the handset will beep unless set to a handset-to-handset channel. (See Section 5.2 for channel settings.)

To make a call using the Mesh Handset:

- Select the call option (see sections 5.1-5.4)
- Press and hold the PTT button
- Speak into the microphone
- Release the PTT button to hear any responses

5.1 CALLING THE ENTIRE NETWORK (BROADCAST CALL)

Broadcast calls on the network will be heard by all handsets on the network. Broadcast calls made while in handset-to-handset mode will be received by all handsets in range that are also in handset-to-handset mode. Handsets receiving a broadcast call do not have to have the broadcast channel selected to hear the call.

To make a broadcast call, set the Group Select knob to either channel 1 or 16 depending on the type of call. Channel 1 is for network broadcast calls and channel 16 is used to make a broadcast call when in handset-to-handset mode.

5.2 CALLING A GROUP

When the handset is first powered on, the voice call destination is set to the currently selected Group as indicated by the Group Select knob. The destination Group may be changed by turning the Group Select knob.

Group calls will only be heard by handsets that have selected the same Group. The 14 available Groups are listed below (along with two broadcast options). If the letter “T” is displayed after the Group number, this indicates a handset-to-handset mode (out-of-network-range) Group call.

Group Select Knob Setting	Group ID	Call Type
1	Bcast	Network Broadcast Call
2	Group1	Network Group Call
3	Group2	Network Group Call
4	Group3	Network Group Call
5	Group4	Network Group Call
6	Group5	Network Group Call
7	Group6	Network Group Call
8	Group7	Network Group Call
9	Group7T	Handset-to-Handset Group Call
10	Group6T	Handset-to-Handset Group Cal
11	Group5T	Handset-to-Handset Group Call
12	Group4T	Handset-to-Handset Group Call
13	Group3T	Handset-to-Handset Group Call
14	Group2T	Handset-to-Handset Group Call
15	Group1T	Handset-to-Handset Group Call
16	BcastT	Handset-to-Handset Broadcast Call

To place a Group call, make sure that the Group you wish to call is shown in the display, press and hold the PTT button, and speak into the microphone.

If the call destination is not set to a group, there are several ways to get back into group mode:

- If the display shows an ID number or the Dispatcher (Disp) as the call destination, press the *triangle* (▲) (▼) key below the **Grp** label on the menu.
- If the display shows an ID number or the Dispatcher (Disp) as the call destination, using the Group Select knob to select a group will automatically place the handset back into group mode.
- Pressing the Home button will return the call destination to the currently selected group.

5.3 CALLING AN INDIVIDUAL HANDSET

Individual calls can be placed using the specific ID of one individual handset. Other handsets will not receive the call. A handset can receive individual calls regardless of its current Group channel setting.

To make an individual call, press the *triangle* (▲) (▼) key below the **Ind** label on the display. An ID number will appear on the display in the form **IDXXX**. The ID number displayed will be for the last handset to which an individual call was made.

To change the call destination, use the keypad to enter the ID of the handset you wish to call. If a mistake is made, use the *star* (✻) key to delete the last character entered. Once the correct ID is displayed, press and hold the PTT button and speak into the microphone to place the call. This also sets the current ID as the new default ID until the handset is turned off.

5.4 CALLING THE DISPATCHER

Dispatcher calls are individual calls dedicated for communication with the Dispatcher.

To place a Dispatcher call:

- From the Home menu - Select the *up triangle* (▲) Menu Select key under the label **Dsp**. The display will show **Disp** as the call destination. Press and hold the PTT button to call the Dispatcher.
- From the Individual call screen – If you have completed an individual call and want to call the dispatcher, select the *down triangle* (▼) Menu Select key under the label **Dsp**.

5.5 ANSWERING A CALL

A pop-up screen will appear when a call is being received. When a call is received, simply press and hold the PTT button and speak into the microphone. Be sure to release the PTT button to receive a response. When an individual call is received, the handset will generate an alert tone and display the handset ID. To respond, press and hold the PTT button and speak into the microphone. If you do not respond within 15 seconds, the handset will end the call and revert to displaying the selected group.

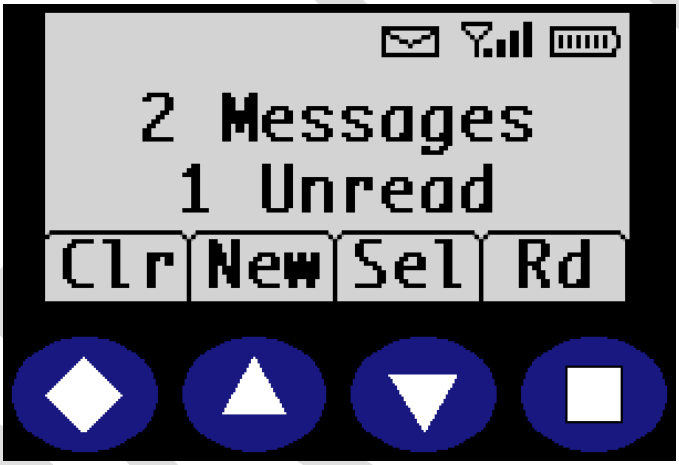
6.0 SENDING AND RECEIVING TEXT MESSAGES

Text messages may be sent and received in a manner similar to cell phone text messaging when on the network. If you are in handset-to-handset mode, you may read your current text messages, but you cannot send or receive messages until back in network range.

To access the Text Message menu from the Home menu, press the *square* (■) key under the **Txt** option (see Figure 2). The display will change to the Text Message menu (see Figure 4). From here you may:

- Clear (**Clr**) all current text messages
- Compose a custom (**New**) text message
- Select (**Sel**) a pre-programmed message
- Read (**Rd**) your received text messages

If no selection is made within a few seconds, the display will return to the Home menu.



Text Message Menu

Figure 3

6.1 READING RECEIVED TEXT MESSAGES

If you have received a new text message, an envelope icon will appear at the top of the display (see section 4.3.4).

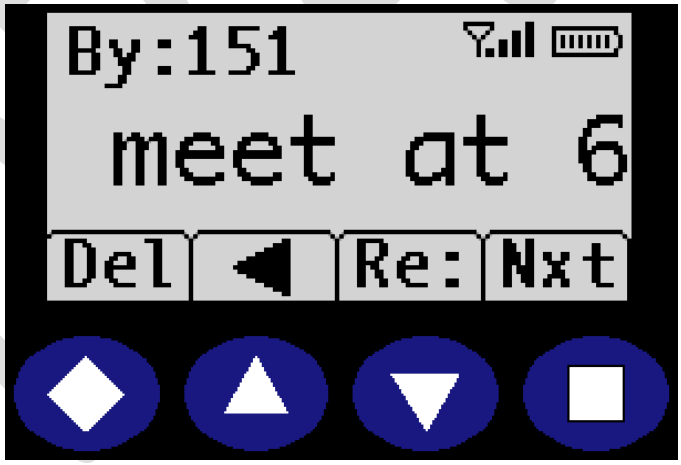
To view new text messages:

- Press the *square* (■) key labeled **Txt** on the Home menu (see Figure 2). The display will change to the Text Message menu (see Figure 4).
- Press the *square* (■) key again, this time labeled **Rd.** This will take you to the Text Message Viewing menu to read your text messages (see Figure 5).

When reading messages, if the *square* (■) key is labeled **Nxt**, pressing it will advance the display to the next message. If there are no additional messages, the *square* (■) key will be labeled **Bck** and return you to the Home menu.

Use the *triangle* (▲) (▼) keys to scroll through messages that are too long to be displayed in their entirety on the screen.

The sender's ID is shown in the upper right of the display (see Figure 5). To reply, press the *triangle* (▲) (▼) key labeled **Re:**. Choosing to reply will take you to the custom text message screen (see Section 6.3). **Note:** When in the middle of a long message, the triangle keys will both be labeled for scrolling. Simply scroll to the beginning or end of a message to get the **Re:** option. The **Re:** option will display after a second to ensure it is not chosen by mistake while trying to scroll.



Text Message Viewing Menu

Figure 4

The *diamond* (◆) key labeled **Del** will delete the current text message. When deleting a message, a confirmation menu will appear. On the confirmation menu screen, select **Yes** using the *down triangle* (▼) or **No** using the *square* (■) key.

Delete Message screen

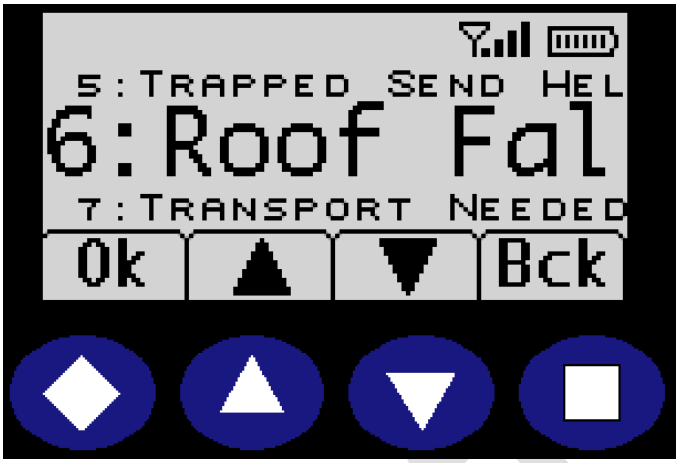
Figure 6

6.2 CHOOSING PRE-PROGRAMMED TEXT MESSAGES

The Mesh Handset can have several standard pre-programmed text messages.

To select a pre-programmed message (if included on your handset):

- Press the *square* (■) key labeled **Txt** in the Home menu (see Figure 2). The Text Message menu will appear (see Figure 4).
- Next press the *down triangle* (▼) key labeled **Sel**. This will bring up the Pre-programmed Message menu (see Figure 7).
- Use the *triangle* (▲) (▼) keys to scroll through the pre-programmed message options. You may also use the number keys to jump to a message.
- Once the message you wish to send is selected, press the *diamond* (◆) key labeled **Ok**. This will take you to the menu for Sending a Text Message (see Section 6.4).



Pre-programmed Message Menu

Figure 7

6.3 COMPOSING CUSTOM TEXT MESSAGES

The Mesh Handset can also be used to send custom text messages.

To compose a custom text message:

- Press the *square* (■) key labeled **Txt** in the Home menu (see Figure 2).
- Next press the *up triangle* (▲) key labeled **New**. This will bring up the Custom Message screen (see Figure 8). The current destination will be shown in the top left. The middle of the display will be blank.

The keypad is used to enter text. Repeatedly pressing a key will rotate through the letters and numbers associated with that key. After pressing a key, the current character will be surrounded by a block cursor. If you press another key, or after a brief pause in pressing the button, the cursor will move to the next character (see Figure 8).

Example:
Type "Hello" on the Custom Message screen following the steps below:

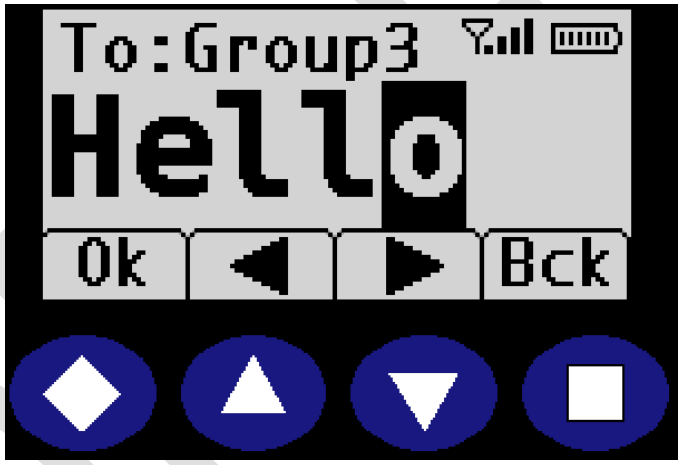
- Press the **4** key two times without pausing between.
- Press the **3** key two times without pausing between.
- Press the **5** key three times without pausing between.
- Pause for a moment until the letter is no longer surrounded by a block cursor.
- Press the **5** key three times without pausing between.
- Press the **6** key three times without pausing between.

Tips when typing your message:

- The *triangle* (▲) (▼) keys can be used to move the cursor left and right.
- Pressing the *pound* (**#**) key once will insert a space. Pressing the *pound* (**#**) key multiple times will rotate through various punctuation and other symbols.
- To fix a mistake, press the *star* (✱) key to remove the most recently typed character. This can be done repeatedly, or you can scroll back to an earlier character using the *up triangle* (▲) key, and then press *star* (✱) to remove everything to the right of the cursor.

Once the message you wish to send is entered, press the *diamond* (◆) key labeled **Ok**. This will take you to the Text Message Destination menu (see section 6.4).

Note: When composing a custom message, the current default destination will appear in the upper right corner. If it is incorrect, you will have a chance to change it when accessing the Text Message Destination menu (see Section 6.4).



Custom Text Message Menu

Figure 8

6.4 SENDING A TEXT

Finished text messages can be sent using the Text Message Destination menu (See Figure 9). In this menu, the destination of the text message is shown, in larger characters, above the desired message, in smaller characters. The most recently used destination will display as the default destination.

Group texts
If the default destination is set to an ID or the dispatcher, you can choose to send a group message by pressing the *triangle* (▲) (▼) key labeled **Grp**. You may also change the group destination by using the Group Select knob.

Individual texts
To send a message to a specific handset, press the *triangle* (▲) (▼) key labeled **Ind** and use the keypad to enter the ID number of the handset you wish to text. If the destination is already set to an ID number and you wish to change the ID, simply use the keypad to enter the correct ID number.

Dispatcher texts
To send a message to the Dispatcher, press the *triangle* (▲) (▼) key labeled **Dsp**.

Once you have selected the correct destination, press the *diamond* (◆) key labeled **Snd** to send your message.

Text Message Destination Menu

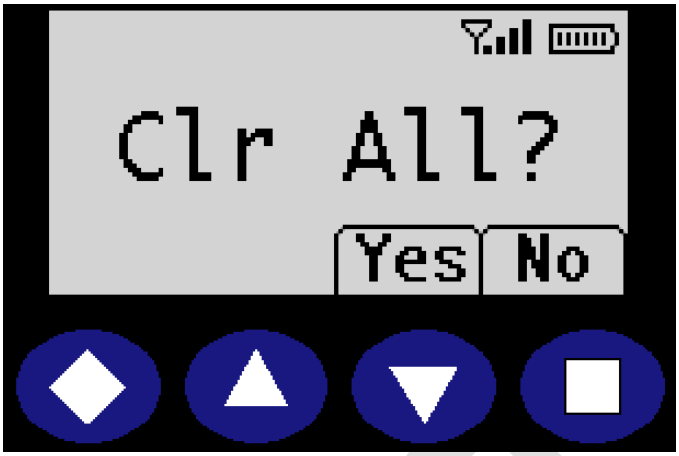
Figure 9

Once you have sent your message, the destination will become the default until changed or the handset has been turned off.

6.5 CLEARING ALL MESSAGES

To clear all messages:

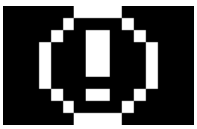
- Press the *square* (■) key labeled **Txt** in the Home menu (see Figure 2).
- While in the Text Message menu (see Figure 4), press the *diamond* (◆) key labeled **Clr**.
- The question "**Clr All?**" will appear on the display (see Figure 10). If you wish to clear all of your text messages, press the *down triangle* (▼) key labeled **Yes**. You may also choose **No** by pressing the *square* (■) key. Once a choice has been selected, the handset will return to the Text Message menu.



Clear All Messages screen

Figure 10

7.0 DECLARING AND RESPONDING TO EMERGENCIES



The Emergency button is orange and located on the top left of the handset in front of the antenna (see Figure 1). To declare an emergency:

- Press the Emergency button for three seconds to place the handset into emergency mode.
- Press the PTT button to declare an emergency to the Dispatcher.

During emergency mode:

- an immediate notification will be sent to the Dispatch Workstation and the Dispatch Handset;
- the Mesh Handset will vibrate and give an audible alert;
- the LED status light (see Figure 1) will blink red; and
- an emergency icon will appear in the top-right corner of the display.

Once in emergency mode, you may notify others by placing a call or sending a text message. Each handset user who receives the call or text, based on normal destination rules, will receive an audible alert and feel the handset vibrate.

After the emergency has been addressed, you can deactivate emergency mode by pressing and holding the Emergency button for three seconds. The handset will beep and the emergency icon will be hidden to indicate emergency mode has ended. If not manually cleared, after successfully notifying others, emergency mode will automatically be cleared if 30 seconds passes with no emergency voice or text being sent or received.

8.0 MAINTAINING THE HANDSET

8.1 CHARGING THE LITHIUM-ION BATTERY PACK

Single bay and six-bay chargers are available to charge the Mesh Handset. Before first use, the handset must be fully charged.

To charge the handset:

- Plug the charger into a power source.
- Turn the handset off.
- Set handset into charger.
- The Charging status LED will be amber while the battery is charging.
- When the battery is fully charged, the Charging LED will turn off. The Ready LED will turn green.
- When powered on, the handset's LED status will also be green to indicate it is fully charged.

The battery pack can also be removed and charged on its own.

- To remove the battery, depress the tab at the top and slide the battery down.
- To reattach the battery, insert the two plastic tabs at the bottom of the battery pack into the slots at the bottom of the handset base. Then depress the tab at top of the battery pack and hold while gently pushing the battery pack and handset together until an audible click is heard.

Note: The battery pack can be expected to have at least 24 hours of battery life when charged.

8.2 CLEANING THE HANDSET

The handset is designed to require minimal maintenance from the user. If the handset is dirty, use a 1" paint brush or similar brush to clean loose dust and debris from the handset before wiping clean with a damp cloth. Take care not to scratch the display. Do not use chemical or abrasive cleaners as this may result in damage to the housing of the handset.

9.0 WARRANTY INFORMATION

Never disassemble the handset or the intrinsically safe (IS) battery pack. Doing so will void your warranty. If your handset or its battery pack is damaged, do not use it.