	TRAINING AND EQUIPMENT MANUAL **COMMUNICATIONS COMPONENTS** **305.002b HARRIS UNITY XG-100** **EFFECTIVE: MARCH 2013**		
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PURPOSE

The purpose of this policy is to familiarize members with the components, features, use, maintenance, and troubleshooting of the Harris Unity portable radio.

APPLICATION

The Harris Unity is one of the portable radios used by the Fresno Fire Department (FFD or Department) for emergency and non-emergency radio communications.

OPERATIONAL POLICY

Members will become familiar with the components, features, use, maintenance, and troubleshooting of this radio as it becomes a firefighter's lifeline at an emergency scene.

OPERATIONAL GUIDELINE

The Harris Unity is a two-way radio, which transmits and receives on VHF, UHF, and the 700 and 800 MHz frequencies. It offers the capability of 12,500 channels broken down into 10 mission plans capable of 64 zones containing up to 48 channels per zone. It has a power output when transmitting between 0.5 and 6 watts depending on frequency and configuration.

PROCESS

Battery Information

This radio is powered by a Li-Polymer rechargeable battery. Charge the battery before use to ensure optimum capacity and performance. For optimum results, the battery should be charged at temperatures between 32° F and 113° F. Battery Life (at 5% Tx, 5% Rx, and 90% standby) Li-Polymer: >12 hours. Storing a portable

radio in a charger reduces the life of the battery. Once a battery is fully charged, it needs to be removed from the charger.

When charging the battery, the charger LED indicates the charging progress:

LED Color	Battery/Charger Status
Constant Green	Charge Complete
Long Green Flash	Trickle Charge
Short Green Flash	Rapid Charge
Flashing Red	Temperature Fault
Constant Red	System Fault

Radio Components

Power/Volume Control Knob: Turns the radio on or off and adjusts the volume.

Channel Selector Knob: Switches the radio to different channels within the selected zone.

Channel Bank Selector A/B/C: Each bank can contain 16 channels, allowing a total of 48 channels per zone.

Indicator LED: Illuminates red when transmitting and green when receiving.

Top Display: The zone, channel number, name of channel selected, and current battery power are displayed. The orientation and brightness can be adjusted in the settings.

Key Pad Lock/Unlock: It locks and unlocks the key pad. When locked, a padlock image will be visible in the display screen.

Built-in GPS Receiver: Sends the user position data securely over the air (only on digital channels).

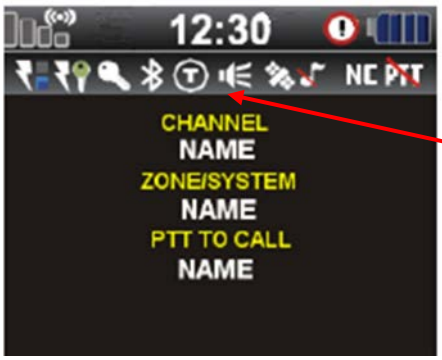
Accessory Connection: Connection point for remote speaker microphone and other accessories. *When no accessory is being used, the dust cover should be fastened in place*.

Zone Up/Zone Down: These two buttons allow the user to scroll between the zones within the selected mission plan (long press buttons).

Talk Around: Talk Around mode (Direct mode) enables one radio to communicate with another radio in simplex mode (line of sight). This has limited range.

The Harris Unity radios are normally kept in Repeater mode (Duplex Frequency). In Repeater mode, the radio will utilize a repeater to transmit traffic. This will allow the Harris Unity to send a signal and have the signal repeated to a radio receiving site, which is potentially out of sight, increasing the distance (strength) the radio is able to transmit.

To select the Repeater mode/Talk Around mode, press the preprogrammed Repeater/Talk Around button (small yellow side button) to toggle between Repeater mode and Talk Around mode (long press button).



Talk around symbol, which indicates TA is enabled.

Dual Microphones: When noise cancellation is enabled, the rear microphone is used with the front to form a dual microphone system used for noise cancellation. Noise cancellation improves the quality of the transmitted voice. When noise cancellation is disabled, only the front microphone is used. *Make sure to keep the rear microphone unobstructed. (When a remote speaker microphone is being used, the Harris Unity electronically switches over to use the front microphone instead of the rear because it is likely the radio will be in a holster, which would cover the rear microphone.)*

When sending a message, hold the radio upright, press the push to talk (PTT) button with the microphone one to two inches away from the mouth and speak clearly into

the microphone.

Note: The use of a lapel MIC may limit transmission distance and/or penetration of signal due to the positioning of the portable's antenna. Radio frequencies are transmitted omnidirectional perpendicular to the antenna.

Soft Menu Keys: The Left provides access to the menu screen for user settings. The Right is used to select options when operating within a menu option.

5-Way Navigator: Use to move through the menu and setting screens. The center button is a shortcut (long press) to pre-selected menu options, as well as used to select options within the menu.

The Harris Unity has the capability of being fully programmable on the fly. The FRNCITY mission plan is the only mission plan which should be modified on the fly. When a user wants to reset the Harris Unity to default settings, the user will need to re-load the mission plan. By doing this, the Harris Unity will clear any altered settings by the user and revert to program defaults.

Field members may change mission plans and navigate between zones when necessary to communicate with other agencies.

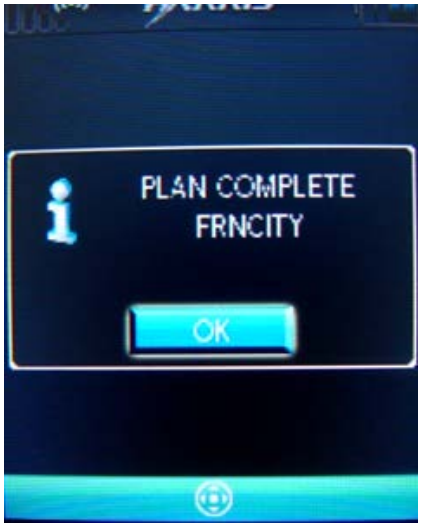
Activating a Mission Plan

1. Enter the main menu using the soft key.

2. Using the 5-way navigator, scroll to the PRGM option and select by pressing the white, center button. Pressing the number 7 key on the alphanumeric key pad is a shortcut option.

3. Using the 5-way navigator, scroll to the desired mission plan and select by pressing the white, center button. Once selected, the screen will display the selected mission plan is being activated.

4. Once activated, select OK by pressing the white, center button. The following two screens will appear:



5. Select OK by pressing the white, center button.

6. Use the soft key to return to the main menu.

Selecting a Zone

Once in the desired mission plan, the user can select the desired zone by using one of two following methods:

Method 1:

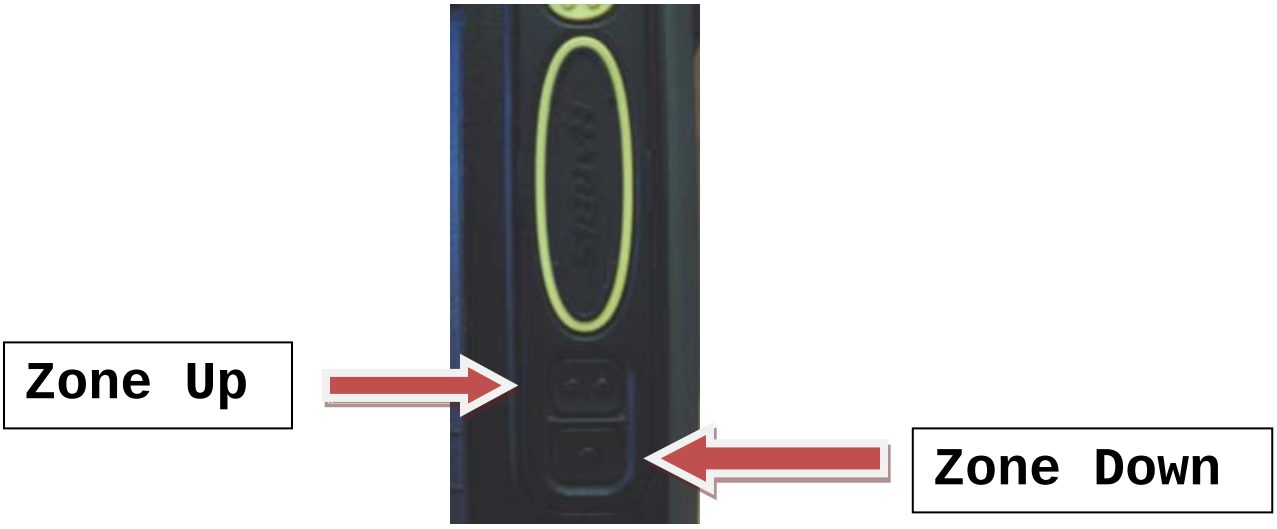
1. Enter the main menu using the soft key.

2. Using the 5-way navigator, scroll to the ZONE option and select by pressing the white, center button.

3. Using the 5-way navigator, scroll to the desired zone and select by pressing the white, center button.

Method 2:

1. Using one of the user defined, long press side buttons.



2. Press the zone up or zone down button (long press) until a new zone indicator appears in the color display.

3. Continue to press the zone up or zone down button until the desired zone is selected. The radio will remain in the last zone selected.

Selecting a Channel Guard

Some channels require the user to select the desired channel guard (tone) to be used while operating on that channel. This is usually dictated by the geographical area of operation. The channel guard will be selected for the **Transmit Frequency (Tx)**

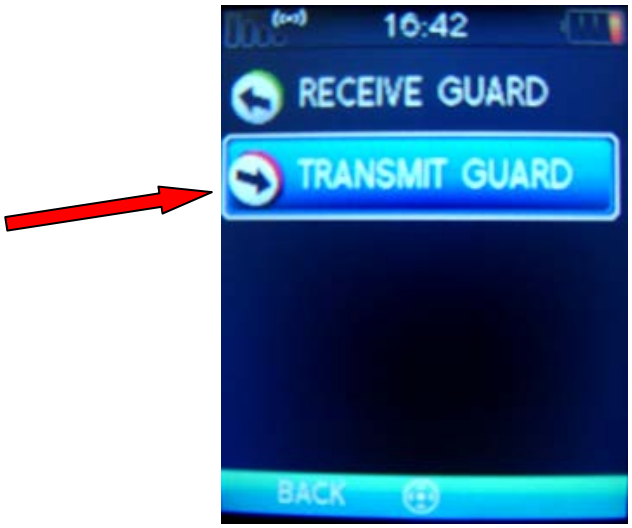
To activate a channel guard:

1. Select the desired channel.

2. Enter the shortcut menu by pressing the white button in the center of the 5-way navigator.

3. Using the 5-way navigator, scroll to the Channel Guard" option and select by pressing the white, center button (pressing the number 4 key on the keypad is a shortcut).

4. Using the 5-way navigator, scroll to the “Transmit Guard” option and select by pressing the white, center button.



5. Using the 5-way navigator, scroll to the desired transmit channel guard and select by pressing the white, center button. The 16 CTCSS channel guards are listed as well as “NONE/NOISE” and “DISABLE”. In the example pictured, Tone 7 is highlighted for selection.

6. Once the selection is made, you will be returned to the previous screen. Using the soft press key select the “BACK” option to return to the channel screen. Once back on the channel screen, the selected channel guard will be displayed above the channel name.

Selected Tone

7. To disable the channel guard repeat steps 1 through 4. Once in the list of channel guards use the 5-way navigator to select the “DISABLE” option.

Scan Mode

The Harris Unity is capable of monitoring and transmitting on multiple channels while in Scan mode. The primary and secondary priority channels will take priority over any other scanned channel. The same channels can be assigned to multiple scan lists.

There are two scan options available:

1. The user can select specific channels to scan from within the selected zone.

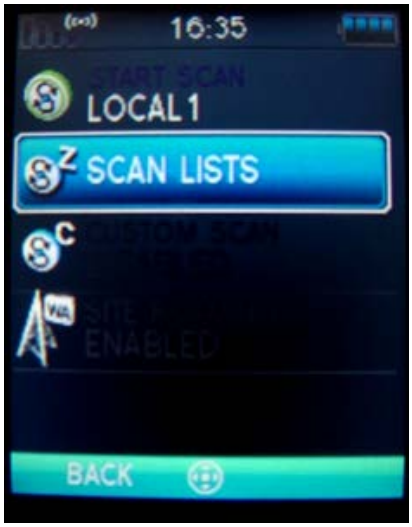
2. The user can create a custom scan list. The user selects channels from any of the zones within the selected mission plan.

Selecting Specific Channels to Scan from Within the Selected Zone

1. Enter the main menu by using the soft key.

2. Using the 5-way navigator, scroll to the “SCAN” option and select by pressing the white, center button.

3. Using the 5-way navigator, scroll to “SCAN LISTS” and select by pressing the white, center button.



4. Using the 5-way navigator, scroll to the desired zone and select by pressing the white, center button.

5. Using the 5-way navigator, channels from within the list can be selected and unselected by highlighting the desired channel and pressing the white, center button.

    a. When the channel is selected as part of the scan group, it will appear in white. When the channel is not selected as part of the scan group, it will appear in gray.

6. Priority 1, Priority 2, and Nuisance channels can be established by highlighting the desired channel and then pressing the “OPTIONS” soft key. Use the 5-way navigator to select your desired option and then press the white, center button to select.

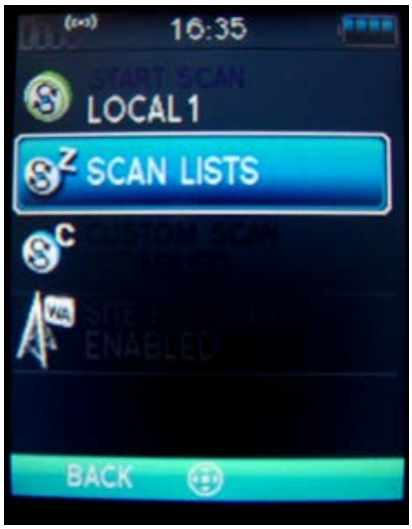
7. Once you have selected your desired channels and set your priorities, use the soft key to “BACK” out of the selection menu.

Creating A Custom Scan List:

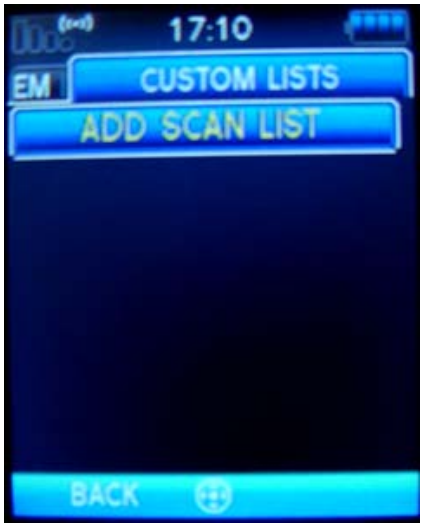
1. Enter the main menu by using the soft key.

2. Using the 5-way navigator, scroll to the “SCAN” option and select by pressing the white, center button.

3. Using the 5-way navigator, scroll to “SCAN LISTS” and select by pressing the white, center button.



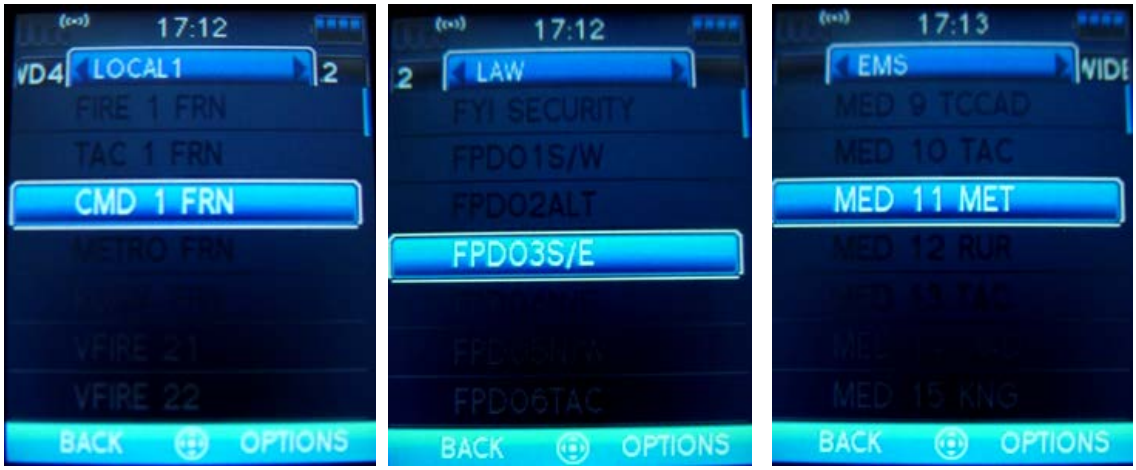
4. Using the 5-way navigator, arrow to the right, opening the "CUSTOM LISTS" tab.



5. Ensure the "ADD SCAN LIST" is highlighted and then press the white, center button. Use the 5-way navigator to scroll down to "NEW LIST 1" and select by pressing the white, center button.

6. Once selected, you can select your desired channels and set your priorities. Every channel from each zone within your selected mission plan is available for your custom scan list. Using the 5-way navigator, scroll left and right to access different zone tabs.

    a. When the channel is selected as part of the scan group, it will appear in white. When the channel is not selected as part of the scan group, it will appear in gray.



7. Priority 1, Priority 2, and Nuisance channels can be established by highlighting the desired channel and then pressing the “OPTIONS” soft key. Use the 5-way navigator to select your desired option and then press the white, center button to select.

There are two methods to start and stop the Scan Mode.

Method 1 - Using the Shortcut Menu:

1. Enter the shortcut menu by pressing the white button in the center of the 5-way navigator.

2. Ensure the “START SCAN” or “STOP SCAN” is highlighted and then press the white button in the center of the 5-way navigator to select (pressing the number 1 key on the key pad will also select the “START SCAN” or “STOP SCAN”).

Method 2 - Using the Main Menu:

1. Enter the main menu by using the soft key.

2. Using the 5-way navigator, scroll to the “SCAN” option and select by pressing the white, center button.

3. Using the 5-way navigator, ensure the desired scan list is highlighted and then either start or stop the scan by pressing the white, center button.

4. Once the scan mode has been started or stopped, the user can navigate back to the channel screen by pressing the “BACK” soft key twice.

When the radio is scanning, the following symbol will be seen on the color display:

When scanning this symbol will appear.

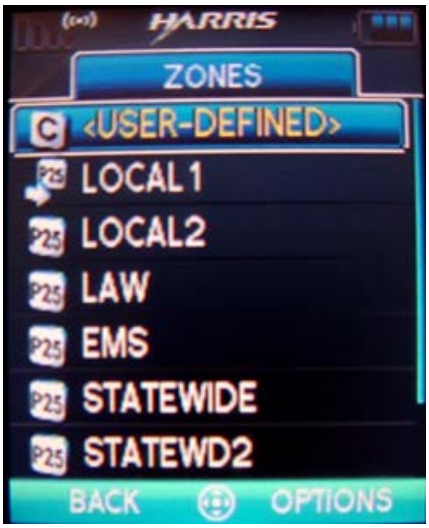
Creating A User Defined Group (Command Group)

The Harris Unity Radio allows for a user defined group to be created. This is similar to the Command Group concept found in Bendix King portable and Kenwood mobile radios being used by the Department. The user defined group is an un-programmed zone within the mission plan, which allows the user to select the desired channels from the pre-programmed zones within the mission plan. Up to 48 channels can be programmed into this group.

1. Enter the main menu by using the soft key.

2. Using the 5-way navigator, scroll to the “ZONE” option and select by pressing the white, center button.

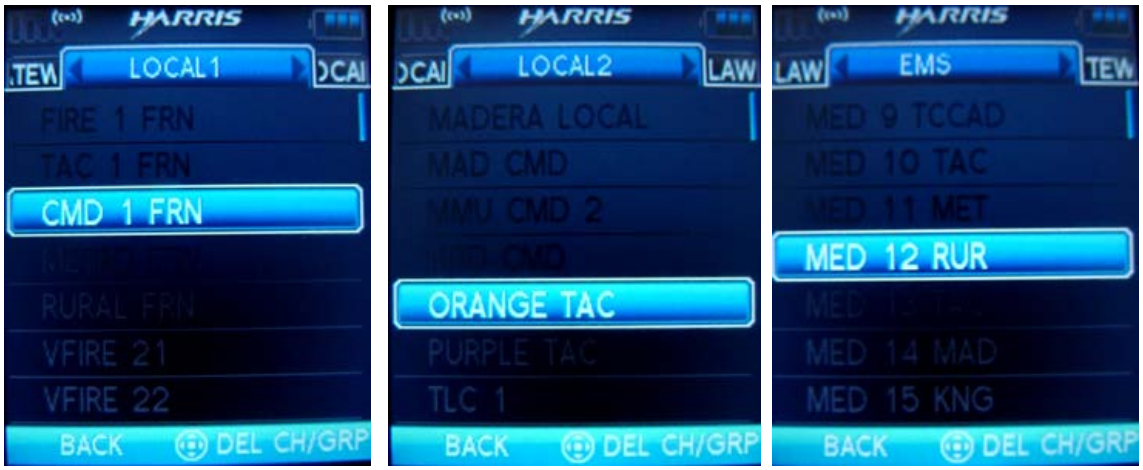
3. Using the 5-way navigator, ensure the “USER-DEFINED” option is highlighted and then press the right soft key to select OPTIONS.



4. Using the 5-way navigator, scroll to the “VIEW/EDIT” option and select by pressing the white, center button.

5. Using the 5-way navigator, scroll up and down through the channels in each zone or left and right to switch zones while selecting your desired channels. The channels can be selected by highlighting the desired channel and then either pressing the white, center button or by pressing the soft key labeled “ADD CH/GRP”. The channels can be removed from the group by highlighting the channel to be removed and then pressing the white, center button or by pressing the soft key labeled “DEL CH/GRP”.

a. The channel sequence will be the order in which the channels were selected when creating the group.



6. Once the desired channels have been selected, use the soft key to back out to the “ZONE” menu.

7. The user defined zone can be renamed if desired. Ensure the "USER-DEFINED" zone is highlighted and then press the soft key labeled "OPTIONS". Using the 5-way navigator, scroll to "RENAME ZONE" and select by pressing the white, center button.

8. Enter the desired name using the alpha-numeric keypad and then select "OK" by pressing the white, center button.

MDC Signaling System

Each Harris Unity XG-100 portable radio is programmed to send and receive MDC signals on Fresno Fire channels. The MDC is a signal that is broadcasted when the Push-to-Talk is released. Each radio has a unique signal which represents the unit or person the radio is assigned.

If another user is using a portable radio which is broadcasting an MDC signal, the Harris radio color display will display the corresponding MDC and user. The following is an example of Engine 8 sending an MDC signal:

Radio Troubleshooting

To ensure proper radio usage, the following radio troubleshooting methods are suggested. (For repair and maintenance, refer to *Training and Equipment Manual*, Section 305.003 Repair and Maintenance.)

1. Repeater Mode

    a. Ensure the portable radio is in Repeater mode and not in Talkaround (Direct mode).

    b. When the portable is in Talk Around mode, distance is dramatically decreased.

2. Scan Mode

    a. If the Harris Unity is constantly broadcasting traffic, ensure Scan mode is off.

    b. While using Scan mode, transmission will be enabled (TX) on any channel being scanned.

3. Zones

    a. A Harris Unity can hold 12,500 channels broken down into 10 mission plans capable of 64 zones containing up to 48 channels per zone.

        i. Mission Plan - **FRNCITY,** Zone - **LOCAL 1** is the primary zone utilized by FFD.

ii. Under every zone, up to 48 channels can be stored.

iii. The Harris Unity can store 12,500 channels.

b. Ensure what mission plan and zone desired channel is on.

4. Antennas

a. Full spectrum, 136-870 MHz frequency coverage.

b. If the antenna appears deformed in any manner, slightly pull upward to ensure the Heliflex is still connected.

i. If the antenna is damaged, contact the Communications Team for further assistance.

5. Lapel MIC/Speaker MIC

a. When a lapel MIC is not working properly:

i. Clean contacts.

ii. Check portable contacts and lapel contact pins.

iii. Assure the lapel attachment is seated correctly.

iv. If the lapel MIC still does not work, contact the Communications Team.

6. Charging Contacts

a. When the Harris Unity is seated in the charging station and does not charge:

i. Remove the battery from the charger.

ii. Use a pencil eraser to clean the four metal contacts on the bottom of the battery.

iii. Place the battery back in the charger. Ensure seated properly.

iv. If the LED indicator continues to flash red, contact the Communications Team.

7. The Harris Unity meets the military specification 810F for exposure to water. The radio will tolerate exposure to water, to a limit. If the Harris Unity has an extreme exposure to water (such as submersion for an extended period), **do not** remove the battery, the lapel microphone or the dust cover for the lapel contact.

    a. If a Harris Unity is exposed to water beyond its allowable thresholds, the internal parts of the radio transceiver are subject to irreparable damage.

    b. The following procedures are to be followed when this occurs:

        i. Turn on/off/volume control knob to the off position.

        ii. Deliver all component parts to the Communications station.

Do not, at any time, attempt to recharge a transceiver (radio) which has been subjected to extreme water damage.

INFORMATION

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DEFINITIONS

This section intentionally left blank.

CROSS REFERENCES

Training and Equipment Manual
Section 305.003, Repair and Maintenance.