

TRAINING & USE PROTOCOL

FOR THE USE OF

APX-8000

MULTIBAND PORTABLE RADIO



**700 SOUTH MAPLE AVENUE
GLEN ROCK, NJ 07452**

**GLEN ROCK VOLUNTEER AMBULANCE CORPS.
TRAINING PROTOCOL FOR USE OF APX-8000 PORTABLE RADIOS**

1. INTENT

The intent of this protocol is to establish a training protocol to be followed by the Glen Rock Volunteer Ambulance Corps (GRVAC) in the use of the Model APX8000 Portable Radios.

2. ADMINISTRATION

This Advanced Technology Committee under the direction of the Chief will administer this protocol

3. GENERAL INFORMATION

The GRVAC operates a fleet of Motorola APX8000 portable radios at this time. Two of these radios are located in each vehicle. In addition, each Line Officer has a radio assigned to them.

4. DEFINITIONS

The following is a list definitions used in this document and when discussing radio communications in general.

Term	Definition
VHF (Very High Frequency))	A group of frequencies in the 136 to 174 MHz radio band. VHF high band frequencies for public safety generally are in the 153 to 159 MHz range within this band. Our VHF radios operate in high band (150-174 MHz) frequency range.
UHF (Ultra-High Frequency)	A group of frequencies in the 378-512 MHz radio band. Our UHF radios operate in this frequency range.

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Term	Definition
Mobile Radio	A radio that is a permanent part of a vehicle. Our ambulances are equipped with one VHF and one UHF radio in the front console. In addition there is a second VHF radio in the patient compartment that used to be used to communicate with the various ER's that we serve. This function is now done via cell phone.
Portable Radio	A radio that is handheld and used remote from the ambulance. Other names may be handheld radio or walkie-talkie.
Frequency	All radios operated on various radio frequencies. The Federal Communication Commission assigns these frequencies and assigns licenses for their use.
Simplex Channel (DIRECT)	Also known as a direct channel. Both the transmitter and receiver are operating on the same frequency. Communications goes directly from one radio to another and does NOT traveling through a repeater or third party equipment. A simplex channel is preferred for working in basements, over distances of one mile or less, or when building construction or terrain impede signals on repeated channels from operating sufficiently.
Repeated Channel (RPT)	Used to extend the range of a radio signal over longer distances by receiving it on one frequency and re-transmitting it on a second frequency from a higher location and with more transmitter power.
Interoperability	Interoperable Communications for Public Safety is defined as the ability of public safety services and support providers to talk with each other via voice and data on demand, in real time, when needed and when authorized

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Term	Definition
Private Line or TPL	<p>Also known as Continuous Tone-Coded Squelch System (CTCSS) and Private Line (PL). A sub-audible analog tone that may be transmitted by a radio. It is used to group radios and thus avoid unnecessary chatter from being heard on a radio.</p> <p>Please note that the frequency may be busy and you may not hear the communications. Therefore it is imperative that checking for a "<i>clear channel</i>" should precede any radio transmission.</p>
DPL	<p>A sub-audible digital signal that may be transmitted by a radio. It is used to group radios and thus avoid unnecessary chatter from being heard on a radio.</p> <p>Please note that the frequency may be busy and you may not hear the communications. Therefore it is imperative that checking for a "<i>clear channel</i>" should precede any radio transmission.</p>
Clear Channel	A confirmation that the frequency is clear prior to a transmission. This may be checked by momentarily depressing the side Upper Control Button.
Zone	Motorola's terminology for a bank of radio channels.
Scan	The ability for a radio to scan various modes for activity. The GRVAC only uses SCAN Mode on the EMS/FIRE 1 mode.
Mode OR Channel	A specific combination of frequency, TPL, DPL, and scan channels that are programmed into the radio.
Priority Channel	This is the designated mode that the radio will return to even if it has been receiving on a different channel.

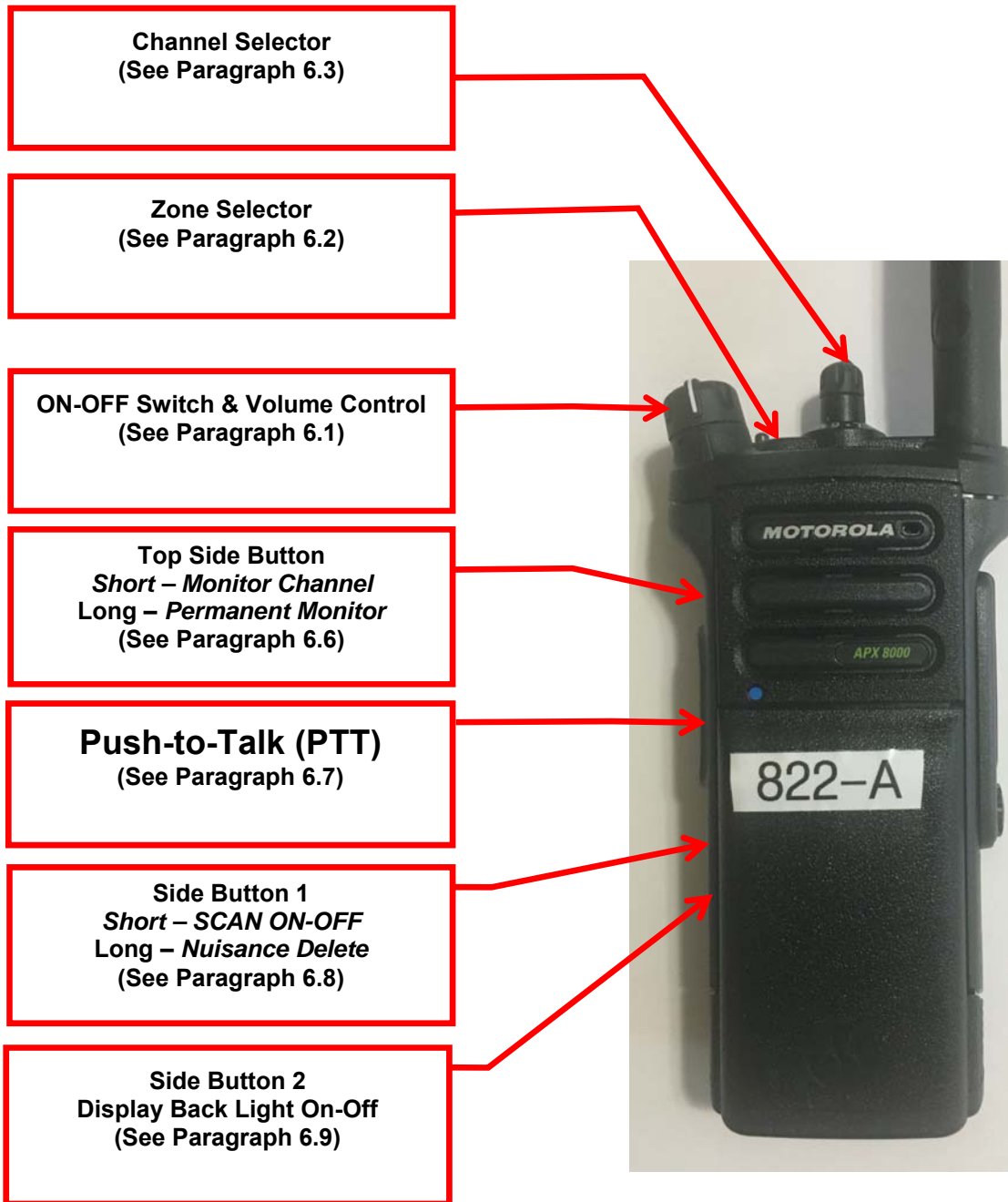
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Term	Definition
Nuisance Channel	When operating in SCAN mode, at times a channel becomes busy and is of no importance. This can cause confusion on the radio
Nuisance Channel Delete	When operating in SCAN mode, this will temporarily delete a channel from the SCAN List.

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5. LOCATION AND FUNCTION OF CONTROLS

5.1 Front View of APX8000 Portable Radio



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5.2 Top View of APX8000 Portable Radio



**ON-OFF Switch And
Volume Control
(See Paragraph 6.1)**

**Zone Selector
(See Paragraph 6.2)**

**EMERGENCY
CALL BUTTON
(See Paragraph 6.4)**

**Status LED
(See Paragraph 6.5)**

**Channel Selector
(See Paragraph 6.3)**

**Top Display Screen
(See Paragraph 7.1)**

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SIDE VIEW OF APX8000 PORTABLE RADIO

Top Side Button
Short – Monitor Channel
Long – Permanent Monitor
(See Paragraph 6.6)

Push-to-Talk (PTT)
(See Paragraph 6.7)

Side Button 1
Short – SCAN ON-OFF
Long – Nuisance Delete
(See Paragraph 6.8)

Side Button 2
Display Back Light On-Off
(See Paragraph 6.9)



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5.3 Side View of APX8000 Portable Radio



**Main Display Screen
(See Paragraph 7.2)**

**Soft Keys
(See Paragraph 7.2.1)**

**Menu Select Buttons
(See Paragraph 7.2.2)**

**Data Feature Button
Not Used**

**4-Way Navigation
Button
(See Paragraph 7.2.4)**

**Home Button
(See Paragraph 7.2.3)**

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6. DESCRIPTION AND USE OF RADIO CONTROLS

6.1 ONOFF Switch and Volume Control

The function of the ONOFF Switch and Volume Control knob should be self-explanatory. Rotating this knob to the extreme counterclockwise direction will turn the radio OFF. Rotating this knob to in the clockwise direction will turn the radio ON and increase the volume.

6.2 Zone Selector

The Zone Selector knob is used to select the Zone that the radio will be operating in. Position A is located at the extreme counterclockwise direction while Position C is located at the extreme clockwise direction.

6.3 Channel Selector

The Channel Selector knob is used to select the frequency that the radio will be operating on. Position 1 is located at the extreme counterclockwise direction while Position 16 is located at the extreme clockwise direction.

6.4 Emergency Call Button

This button will activate a Silent Emergency Call on the radio. This will transmit a silent message with the radio identifier to Central Dispatch.

1. Press the Emergency button.
2. The display does not change; the LED does not light up, and there is no tone.
3. Silent emergency continues until you
 - a. Press and hold the Emergency button to exit the emergency state. **OR**
 - b. Press and release the Push total (PTT) button to exit the Silent Emergency Alarm mode and enter regular dispatch or Emergency Call mode.

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6.5 Status LED

The LED indicator shows the operational status of the radio as follows:

Solid Red	Radio is transmitting
Blinking Red	Radio is transmitting at low battery condition
Double Blinking Red	Radio is in Emergency Mode
Rapidly Blinking Red	Radio has failed the selftest upon powering up or encountered a fatal error.
Solid Yellow	Channel is Busy
Blinking Yellow	Radio is receiving a secured transmission.
Solid Green	Radio is powering up, or is on a nonpriority channel while in the Scan List Programming mode.

6.6 Top Side Control Button

6.6.1 Momentary (Short) Push

Depressing this button will allow you to momentarily monitor the selected frequency for a “clear channel” prior to transmitting.

6.6.2 Long Push

Depressing and holding this button for three seconds will allow you to monitor the selected frequency for a “clear channel” prior to transmitting. Momentarily depressing this button again will clear this function.

6.7 Push total (PTT) Pushbutton

Depressing this button allows you to transmit by speaking clearly into the radio. Releasing this button returns the radio into the RECEIVE mode.

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6.8 Side Control Button 1

6.8.1 Momentary (Short) Push

When you first turn on the radio, the SCAN is ON.

Momentarily depressing this button will turn the SCAN operation ON and OFF. When the SCAN is turned ON the radio will produce two rising tones. When the SCAN is turned OFF, the radio will produce two falling tones.

If you depress this button while operating in any other Mode, the radio will produce a single tone indicating an error.

6.9 Side Control Button 2

6.9.1 Momentary (Short) Push

Depressing this button will toggle the display back light ON and OFF.

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7. MAIN DISPLAY SCREEN AND SOFT KEYS

This section will be added in a later revision.

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8. GRVAC OPERATING MODES

These radios have been configured with the following Operating Zones and Channels. The GRVAC Titles match the words that appear on the radios in the Corps vehicles. The frequency numbers are for information only. You do not need to remember these numbers.

- Zone A: Contain primary channels for Fire and EMS related to response and ground operations,
- Zone B: At this time Zone B is reserved for future use.
- Zone C: Contains mutual aid channels depending on discipline
- Zone D: Contains the National Interoperability VHF channels
- Zone E: Contains the National Interoperability UHF channels

We typically operate on Zone A - Channel 1 for most of our routine calls.

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8.1 ZONE A

	GRVAC TITLE	Frequency	Primary GRVAC Use
1	1 FD/EMS 1 R	Rx: 154.31000 MHz Rx: TPL 123.0 Tx: 158.98500 MHz Tx: DPL 67.0	This channel is used to communicate with Central Dispatch and incoming ALS units through the area wide repeater system. <i>This is the default channel generally used on calls.</i>
2	2 FD/EMS 1 D	Rx: 154.31000 MHz Rx: PL 110.9 Tx: 158.98500 MHz Tx: PL 123.0	This channel is used to communicate with Central Dispatch and incoming ALS units directly. It is used only when we are advised that the repeater system is not functioning.
3	3 FD/EMS 2 R	Rx: 154.7625 MHz Rx: DPL 67.0 Tx: 159.30750 MHz Tx: DPL 67.0	This is a backup channel that is used to communicate with Central Dispatch and Incoming ALS units through the area wide repeater system. It is used only when we are directed to do so.
4	4 FD/EMS 2 D	Rx: 154.7625 MHz Rx: DPL 67.0 Tx: 154.7625 MHz Tx: DPL 67.0	This is a backup channel that is used to communicate with Central Dispatch and incoming ALS units directly. It is used only when we are advised that the repeater system is not functioning.
5	5 OPS/INFO R	Rx: 155.84250 MHz Rx: DPL 67.0 Tx: 151.43750 MHz Tx: DPL 67.0	
6	6 PD DISP	Rx: 158.7300 MHz Rx: PL 167.9 Tx: 151.4525 MHz Tx: PL 123.0	This is the primary channel used for police department dispatching. EMS should not transmit on this channel unless it is an emergency or we are directed to do so.

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	GRVAC TITLE	Frequency	Primary GRVAC Use
7	7 TAC A (TAC ALPHA)	Rx: 155.4750 MHz Rx: DPL 67.0 Tx: 151.4375 MHz Tx: DPL 67.0	This channel is one of four tactical channels that can be used by the various emergency services service by Central Dispatch and may be requested/assigned during a major operation.
8	8 TAC B (TAC BRAVO)	Rx: 158.8950 MHz Rx: DPL 67.0 Tx: 158.8950 MHz Tx: DPL 67.0	This channel is one of four tactical channels that can be used by the various emergency services service by Central Dispatch and may be requested/assigned during a major operation.
9	9 TAC C (TAC CHARLIE)	Rx: 154.89750 MHz Rx: DPL 67.0 Tx: 154.89750 MHz Tx: DPL 67.0	This channel is one of four tactical channels that can be used by the various emergency services service by Central Dispatch and may be requested/assigned during a major operation.
10	10 TAC D (TAC DELTA)	Rx: 159.30750 MHz Rx: DPL 67.0 Tx: 159.30750 MHz Tx: DPL 67.0	This channel is one of four tactical channels that can be used by the various emergency services service by Central Dispatch and may be requested/assigned during a major operation.

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	GRVAC TITLE	Frequency	Primary GRVAC Use
11	11 SPEN 1	Rx: 154.6800 MHz Rx: PL 131.8 Tx: 159.30750 MHz Tx: DPL 67.0	This channel is a statewide police Inter-Agency Communications and is monitored by most Communications Centers. SPEN-1 is generally used as a hailing frequency between Communications Centers and may not be used for operational or tactical radio traffic <i>It is generally not used by GRVAC except for an emergency situation such as vehicle breakdown outside of our service area. Cell phones would be a better choice.</i>
12	Hawthorne PD	Rx: 460.1125 MHz Rx: TPL 131.8 Tx: 465.1125 MHz Tx: DPL 023	Used to communicate with Hawthorne PD Dispatch when responding to a call in the Borough of Hawthorne
13	Fairlawn PD	Rx: 477.4000 MHz Rx: TPL 173.8 Tx: 480.4000 MHz Tx: PL 173.8	Used to communicate with Fairlawn PD Dispatch when responding to a call in the Borough of Fairlawn
14	14 J3/DSASTR (Formerly Rig to Rig)	Rx: 155.28000 MHz Rx: CSQ Tx: 155.28000 MHz Tx: PL 100.0	This channel is a Statewide EMS Coordination. It can be used for intra agency communications by the GRVAC or during an MCI.
15	15 J4/SPEN4	Rx: 153.7850 MHz Rx: CSQ Tx: 153.7850 MHz Tx: PL 131.8	Fire and EMS Inter-agency VHF Interoperability Tactical Channel generally used when responding to a MCI outside of our primary service area. This frequency is mostly used in mobile and portable radios and is not usually monitored by Communications Centers.
16	16 GR PAGING	Rx: 158.9400 MHz Rx: CSQ Tx: 153.7850 MHz Tx: PL 123.0	This is the channel on which the GRVAC paging system operates.

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8.2 ZONE B

At this time Zone B is reserved for future use.

	GRVAC TITLE	Frequency	Primary GRVAC Use
1	1 FD/EMS 1 R	Rx: 154.31000 MHz Rx: TPL 123.0 Tx: 158.98500 MHz Tx: DPL 67.0	This channel is used to communicate with Central Dispatch and incoming ALS units through the area wide repeater system. <i>This is the default channel generally used on calls.</i>

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8.3 ZONE C

	GRVAC TITLE	Frequency	Primary GRVAC Use
1	1 FD/EMS 1 R	Rx: 154.31000 MHz Rx: TPL 123.0 Tx: 158.98500 MHz Tx: DPL 67.0	This channel is used to communicate with Central Dispatch and incoming ALS units through the area wide repeater system. <i>This is the default channel generally used on calls.</i>
2	2 J1/MICOM	Rx: 155.17500 MHz Rx: PL 100.0 Tx: 155.17500 MHz Tx: PL 100.0	This is the primary channel used to dispatch an ALS unit by MICOM in western Bergen County. This channel is generally not used by us.
3	3 J2 HEAR	Rx: 155.34000 MHz Rx: CSQ Tx: 155.34000 MHz Tx: PL 100.0	This channel is assigned for Ambulance to Hospital communications. It is also sometimes used during an MCI. This channel has been replaced by cell phones but must be available. We have a HEAR radio in the patient compartment that will be covered later.
4	Central – OEM (UHF)	Rx: 472.375 MHz Rx: TPL 156.7 Tx: 475.375 MHz Tx: TPL 156.7	UHF channel used to communicate to Central Dispatch when authorized to do so.
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	GRVAC TITLE	Frequency	Primary GRVAC Use
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8.4 ZONE D

	GRVAC TITLE	Frequency	Primary GRVAC Use
1	1 FD/EMS 1 R	Rx: 154.31000 MHz Rx: TPL 123.0 Tx: 158.98500 MHz Tx: DPL 67.0	This channel is used to communicate with Central Dispatch and incoming ALS units through the area wide repeater system. <i>This is the default channel generally used on calls.</i>
2	2 VCALL 10	Rx: 155.75250 MHz Rx: CSQ Tx: 155.75250 MHz Tx: PL 156.7	This channel is for multi-discipline use during an MCI. It is used as a calling (hailing) frequency to make initial contact with another unit. Continued and ongoing communications should be moved to an available VTAC channel.
3	3 VTAC 11/1	Rx: 151.1375 Hz Rx: CSQ Tx: 151.1375 MHz Tx: PL 156.7	Multi-discipline use for ongoing mutual aid radio traffic
4	4 VTAC 12/2	Rx: 154.45250 MHz Rx: CSQ Tx: 154.45250 MHz Tx: PL 156.7	Multi-discipline use for ongoing mutual aid radio traffic
5	5 VTAC 13/3	Rx: 158.73750 MHz Rx: CSQ Tx: 158.73750 MHz Tx: PL 156.7	Multi-discipline use for ongoing mutual aid radio traffic
6	6 VTAC 14/4	Rx: 159.47250 MHz Rx: CSQ Tx: 159.47250 MHz Tx: PL 156.7	Multi-discipline use for ongoing mutual aid radio traffic
7	7 VTAC 33 R	Rx: 159.47250 MHz Rx: 156.7 Tx: 151.13750 MHz Tx: PL 136.5	Multi-discipline use for ongoing mutual aid radio traffic
8	8 VTAC 34 R	Rx: 158.73750 MHz Rx: CSQ Tx: 154.4250 MHz Tx: PL 136.5	Multi-discipline use for ongoing mutual aid radio traffic

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	GRVAC TITLE	Frequency	Primary GRVAC Use
9	9 VTAC 35 R	Rx: 159.47250 MHz Rx: 156.7 Tx: 158.7375 MHz Tx: PL 136.5	Multi-discipline use for ongoing mutual aid radio traffic
10	10 VTAC 36 R	Rx: 151.1375 MHz Rx: CSQ Tx: 159.4725 MHz Tx: PL 136.5	Multi-discipline use for ongoing mutual aid radio traffic
11	11 VTAC 37 R	Rx: 154.45250 MHz Rx: CSQ Tx: 158.73750 MHz Tx: PL 136.5	Multi-discipline use for ongoing mutual aid radio traffic
12	12 VTAC 38 R	Rx: 158.73750 MHz Rx: CSQ Tx: 159.4725 MHz Tx: PL 136.5	Multi-discipline use for ongoing mutual aid radio traffic
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8.5 ZONE E

	GRVAC TITLE	Frequency	Primary GRVAC Use
1	1 FD/EMS 1 RPT	Rx: 154.31000 MHz Rx: TPL 123.0 Tx: 158.98500 MHz Tx: DPL 67.0	This channel is used to communicate with Central Dispatch and incoming ALS units through the area wide repeater system. <i>This is the default channel generally used on calls.</i>
2	UCALL 40	Rx: 453.21250 MHz Rx: PL 156.7 Tx: 453.21250 MHz Tx: PL 156.7	UHF Interoperability Call Channel
3	UTAC 41	Rx: 453.46250 MHz Rx: PL 156.7 Tx: 453.46250 MHz Tx: PL 156.7	UHF Interoperability Tactical Channel
4	UTAC 42	Rx: 453.71250 MHz Rx: PL 156.7 Tx: 458.71250 MHz Tx: PL 156.7	UHF Interoperability Tactical Channel
5	UTAC 43	Rx: 453.86250 MHz Rx: PL 156.7 Tx: 458.86250 MHz Tx: PL 156.7	UHF Interoperability Tactical Channel
6	NJUTAC44	Rx: 470.23750 MHz Rx: PL 186.2 Tx: 473.23750 MHz Tx: PL 186.2	UHF Interoperability Tactical Channel
7	NJUTAC44TA	Rx: 470.23750 MHz Rx: PL 186.2 Tx: 470.23750 MHz Tx: PL 186.2	UHF Interoperability Tactical Channel
8	NJUTAC45	Rx: 470.08750 MHz Rx: PL 173.8 Tx: 473.08750 MHz Tx: PL 173.8	UHF Interoperability Tactical Channel
9	NJUTAC45TA	Rx: 470.08750 MHz Rx: PL 173.8 Tx: 470.08750 MHz Tx: PL 173.8	UHF Interoperability Tactical Channel

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	GRVAC TITLE	Frequency	Primary GRVAC Use
10	NJUTAC46	Rx: 472.87500 MHz Rx: PL 203.5 Tx: 475.87500 MHz Tx: PL 203.5	UHF Interoperability Tactical Channel
11	NJUTAC46TA	Rx: 472.87500 MHz Rx: PL 203.5 Tx: 472.87500 MHz Tx: PL 203.5	UHF Interoperability Tactical Channel
12	NJUTAC47	Rx: 454.15000MHz Rx: PL 136.5 Tx: 475.87500 MHz Tx: PL 136.5	UHF Interoperability Tactical Channel
13	NJUTAC47TA	Rx: 454.15000 MHz Rx: PL 203.5 Tx: 454.15000 MHz Tx: PL 203.5	UHF Interoperability Tactical Channel
14	NJUTAC48	Rx: 454.62500 MHz Rx: PL 141.3 Tx: 459.62500 MHz Tx: PL 141.3	UHF Interoperability Tactical Channel
15	NJUTAC48TA	Rx: 454.62500 MHz Rx: PL 141.3 Tx: 454.62500 MHz Tx: PL 141.3	UHF Interoperability Tactical Channel
16	GRFG/OPS2	Rx: 154.830 MHz Rx: PL 123.0 Tx: 154.830 MHz Tx: PL 123.0	Glen Rock Fire Grounds Operations

9. REVISIONS

The Advanced Technology committee under the direction of the Chief can make revisions to this training protocol to support changes made in the GRVAC operations.