About This Help

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Communications Planning Application

for RF-7850S-TR

This Help is based on version 4.3.0 of RF-7850SH-CD001

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RF-7850S Help and Support

Welcome

CPA for RF-7850S-TR Help supports the creation of Communications Planning Application (CPA) radio plan files in the *.hcpa file format for Harris RF-7850S-TR radio. This includes the nets and system topologies in which the radio is used.

Topics covered in this Help include:

- Station Information
- Features
- Global Settings
- Network Types
- Sample Plans
- Manage Keys
- Program Radio

Refer to these topics for additional support information: Support Overview for Harris contact information, Supported Operating Systems, What's New, and Compatibility for a complete listing of radio/firmware compatibility.

All acronyms used in the Help are defined in the Glossary.

Help

Station Information

The Station Information fields provide basic information about each station as it is added to the plan.

The information in the **Name** and **Description** fields is automatically filled in when a radio is added to a Net or Topology, and can be revised, if required, by selecting the field and typing the required information (English and Arabic character only).

> **NOTE -** Information in the Name field is also displayed in the Plan Explorer portion of the CPA.

The **Notes** field is empty by default. As an option, select the field and type any revised information.

Station Features

List of Features

The following station features are configurable.

Ethernet Interface

The Ethernet Interface property controls the Ethernet-related settings for the radio.

> **NOTE** - When the station is connected to a LAN, the settings with an asterisk (*) are determined by the LAN and are not configurable here.

Ethernet

This setting enables or disables the Ethernet port. When Ethernet is Enabled, the settings below become available.

Address Type*

> **NOTE** - If Dynamic is selected, the radio must be connected to a DHCP server.

Enter **Dynamic** or **Static** as required when not connected to a LAN. Static is required for direct connection to a PC or laptop. When Static is selected, Auto-Share Routes becomes available. Use **Dynamic** when IP Address, Subnet Mask, and a default Gateway are provided by an available DHCP server.

Auto-Share Routes*

Select **Enabled** or **Disabled**. Enabled (default) allows route sharing in Wireless IP-enabled networks.

Static IP Address*

Enter the static IP address for the Ethernet interface. This will be the last octet only when in a LAN.

Static Subnet Mask*

Enter the required subnet mask for the Ethernet interface.

Use LAN Gateway

This is set to Enabled when the Ethernet interface is connected to a LAN. The radio's Gateway address is set to the Gateway property of the Local Area Network. When Disabled, the radio's Static Gateway address is configurable on a per radio basis.

Static Gateway*

Enter the gateway's IP address. Typically this would be the IP address of another connected subnet or domain. This could be another PC, but is not required if the PC is in the same sub-domain.

> **NOTE -** This property is ignored if the current Wireless IP-enabled network specifies a gateway or when using DHCP.

IP Routing

Configure the station's IP Routing settings.

Multicast Mode

Configure how the station will handle multicast traffic. Select Host or Bypass.

Host programs the radio to act as an Internet Group Management Protocol (IGMP) Host. IGMP is a communications protocol used by hosts and adjacent routers on IPv4 networks to establish multicast group memberships. This means only UDP multicast traffic is allowed. Table entries are needed to forward multicast traffic. TTL will decrease when forwarding.

Bypass programs the radio to bypass all IGMP traffic (any type of protocol is allowed and not just UDP). This allows any multicast traffic without further validation of the content and doesn't decrease TTL. TTL is ignored and thus can forward multicast packets with TTL = 1. Table entries are needed to properly "listen" to any address beyond the general IGMP multicast address (224.0.0.1).

Limit Routes

Configure whether the number of routes per applicable network generated to a given destination should be limited. When enabled, set the maximum routes per destination. When disabled, there is no limit on the number of alternate routes that can be generated.

Max Routes Per Destination

Configure the maximum number of routes (1 to 255) per applicable network to generate to a given destination. If the number of available routes is greater than the configured maximum, the routes with the lowest metric values will be used.

Route Table

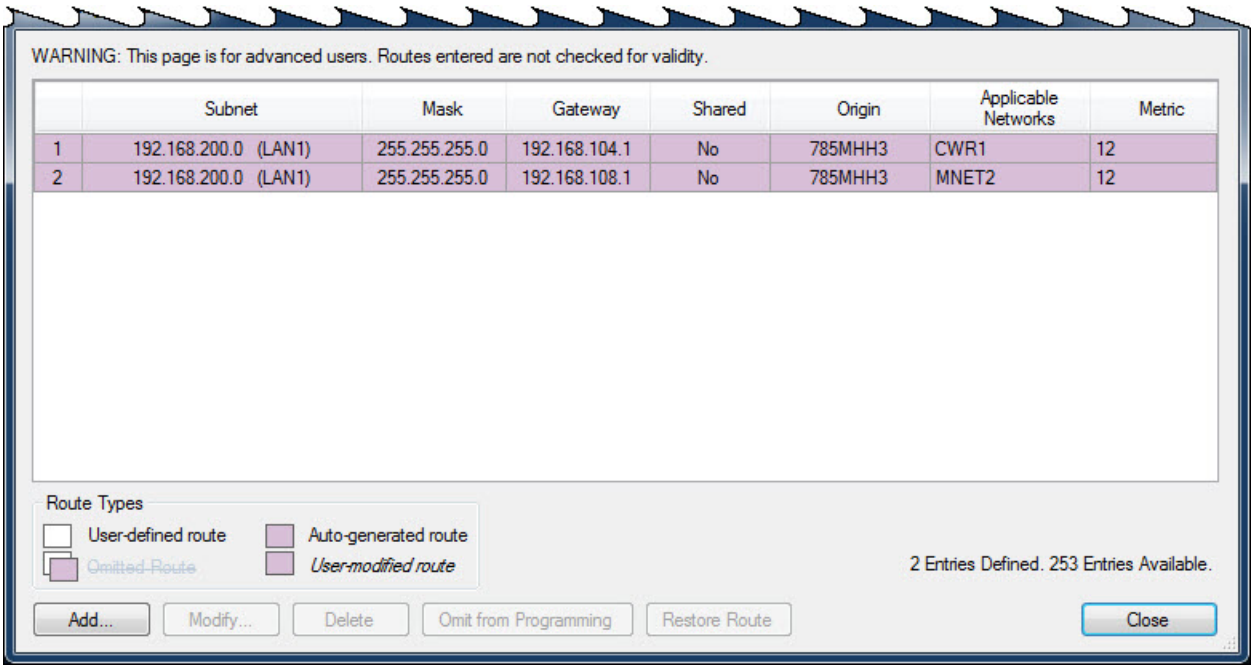
> **CAUTION -** The **Route Table** dialog is intended for advanced users only. New routes may override the default routes. Routes entered on the **Route Table** dialog are not checked for validity.

Select  to access the IP Routing **Route Table**. New Wireless IP network routes may be defined using the **Add IP Route** dialog.

The table uses background coloring and text styles to differentiate between routes as follows:

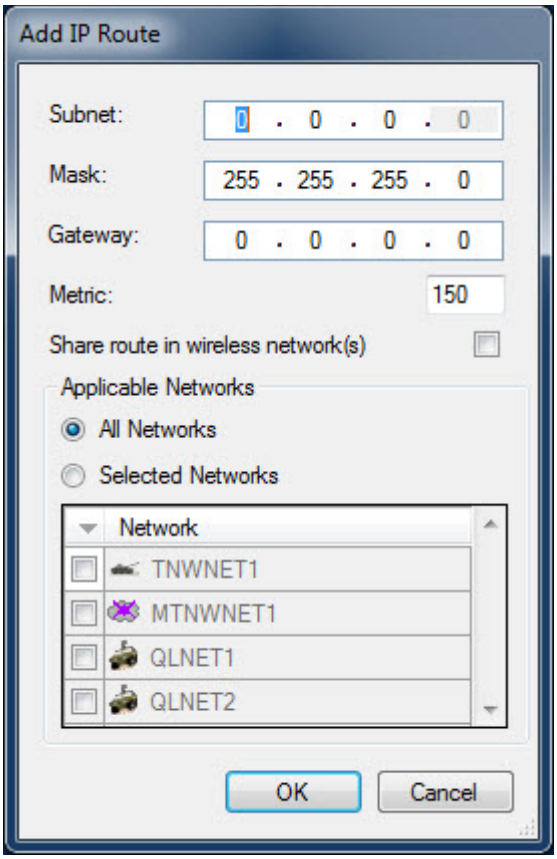
- **White** - User-defined routes. These routes can be edited and removed.
- **Violet** - Auto-generated routes. These routes are automatically created by the CPA and cannot be edited or removed.
- **Violet with *italic* text** - This allows users to modify Applicable Networks (last column only) if the route is auto-generated and was set to ALL (connected to a LAN).
- **Grayed out text with a strike-through line** - User-selected routes that will be omitted from radio programming.

  NOTE - Auto-generated routes can be omitted from programming.



Add an IP Route

1. Select **Add** to add the new route to the route list dialog.
2. Enter the IP addresses for the new route in the **Subnet** field, the **Mask** field, and the **Gateway** field.
3. Select the **Share route in wireless network(s)** check box to allow all radios within a net to use the station as a gateway to reach the route destination. If this box is not checked, individual routes must be set up between the gateway station and each of the other stations in the net.
4. Enter **Metric** (0 to 255) to decide routes priority where lower is better.
5. Select **All Networks** or **Selected Networks**.
6. Select **OK** to add IP Route.



NOTE - Some radio types do not support all net types.

Modify an IP Route

Select the route, select **Modify**, and then make the required changes.

NOTE - If Applicable Networks is set to ALL, the user can only modify the Applicable Networks section of the auto-generated route in this case.

Delete an IP Route

Select the desired route, and then select **Delete**.

Omit an IP Route

Select **Omit from Programming** to omit the IP Route from radio programming.

Restore an IP Route

Select **Restore Route** to reset the changes to a modified auto-generated IP Route back to the defaults.

NOTE - This applies only to those auto-generated routes that were modified in Applicable Networks. The changes are now shown in *italic* text. As soon as you select **Restore Route**, the value will be reset back to ALL and shown in normal text.

Multicast Groups

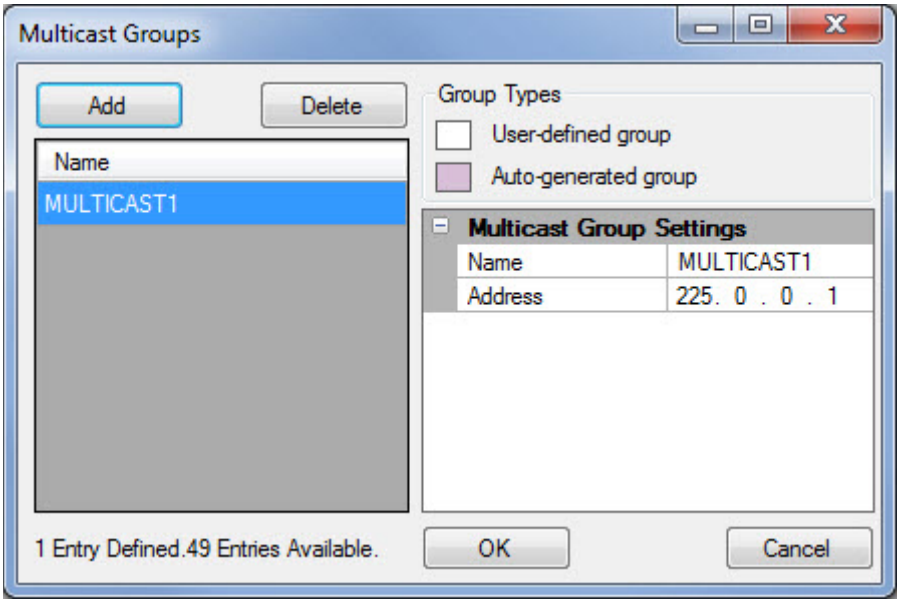
Multicast Packet Forwarding allows configured UDP multicast application data to be forwarded from one of the radio's wired IP interfaces to its wireless interface (or vice versa).

To forward UDP multicast data for a particular multicast group address, the address must be configured on each radio that bridges the networks between the multicast server and clients. The multicast address configuration is part of the radio's existing IP configuration group.

Add Multicast Group

Select [...] to add a new Multicast Group:

1. Select **Add** to view and add Multicast Group IP addresses in the dialog box. Up to (5) Multicast Group entries can be defined.
2. Enter the **Name** and **Address** in the **Multicast Group Settings** box; the Multicast Groups table lists Multicast group addresses to forward.
3. Select **Add** again to add other addresses.
4. Select the group and select **Delete i**f it is necessary to delete a Multicast Group entry.
5. Select **OK** when done.



Multicast TTL

Enter the Time To Live (TTL) value in seconds between 0 to 255. The default is 128 seconds.

TTL sets the lifetime of the datagram in hops.

OSPF

Configure OSPF - Set OSPF to **Enabled** or **Disabled**.

LAN IP is Router ID - Set to Yes or No. If no is selected, you are given the option to set Router ID.

Router ID - Sets the unique Router ID for this radio advertised into the OSPF Network.

Ethernet Settings - Expand property group to configure the OSPF Area settings for the radio's Ethernet Interface.

> **Metric** - Set the OSPF metric (1 - 65535) for the Ethernet Interface. This metric is sent out with routes exported by OSPF.
>
> **Retransmission Interval** - Configure the retransmission interval in seconds (1 - 3600).
>
> **Transmission Delay** - Configure the estimated number of seconds (1 - 3600) required to send a link-state update over the Ethernet Interface.
>
> **Router Priority** - Configure the router priority (0 - 255) for the Ethernet Interface. This is used in the designated router election algorithm.
>
> **Hello Interval** - Configure the Hello Interval (1 - 65535) for the Ethernet Interface.
>
> **Dead Interval** - Configure the Dead Interval (1 - 65535) for the Ethernet Interface. If a router's hello packets are not seen within this number of seconds, its neighbors will consider the router to be down.

Area(s) - Expand property group to configure the OSPF area configuration(s) for the available interfaces.

> **Ethernet** - Expand property group to configure the Ethernet settings.
>
> > **Area ID** - Set the Area ID IP address for the Ethernet.
> >
> > **Area Type** - Select the Area Type as **Standard**, **Stubby**, or **NSSA**.

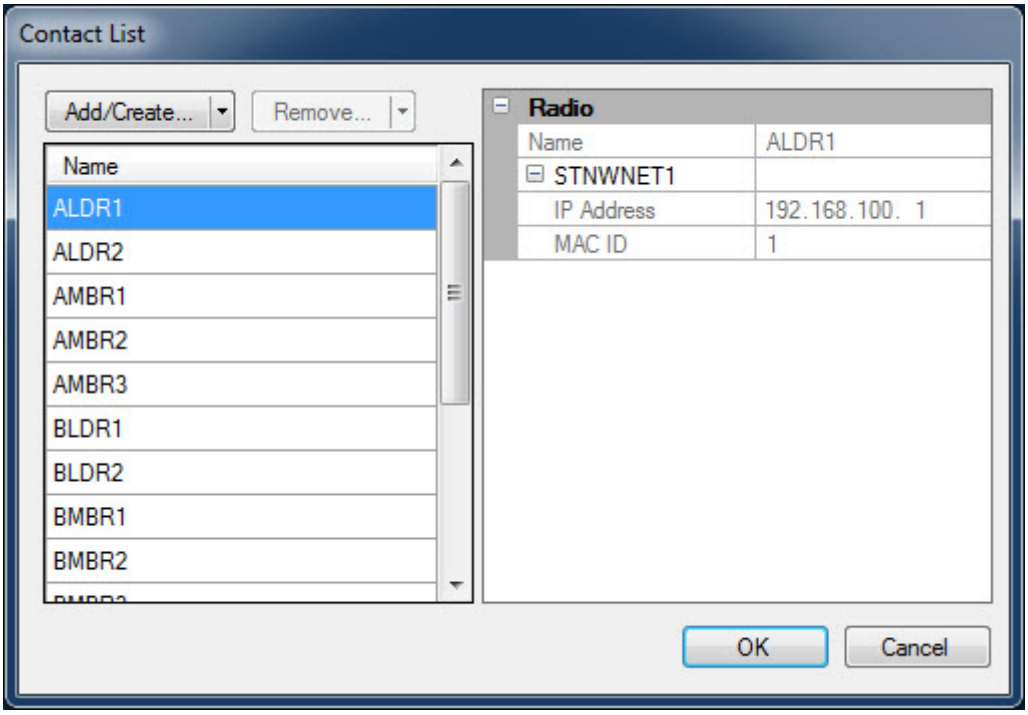
Export Default Routes - Allows the Default Routes to be exported by the OSPF protocol when set to Enabled.

Contact List

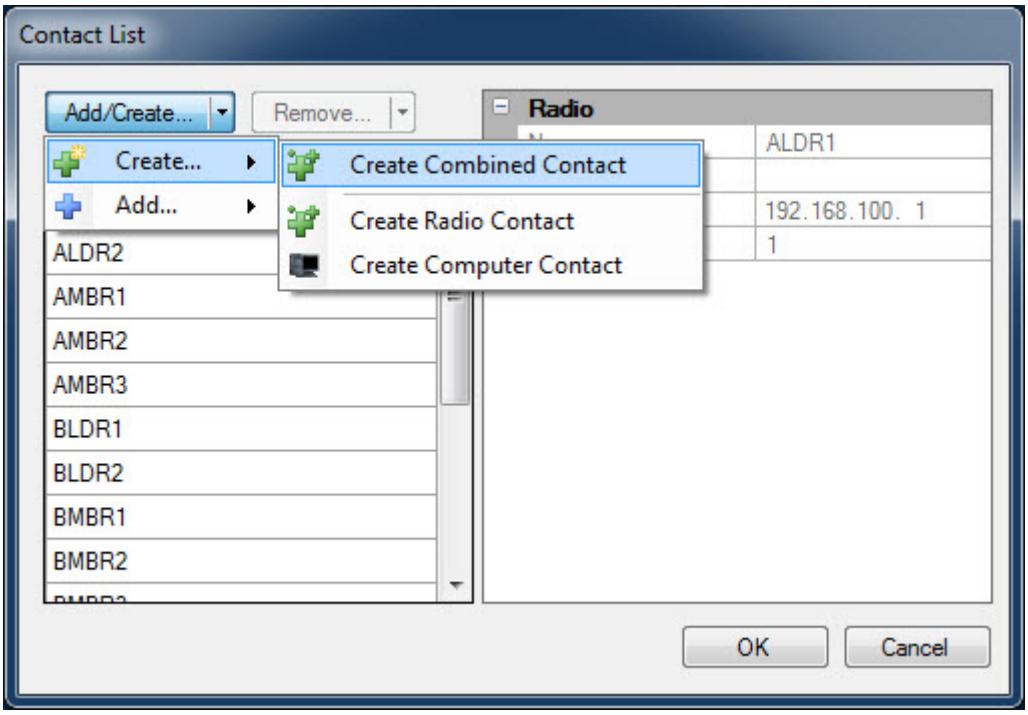
The Contact List is a Tac Chat enhancement that is used primarily for rapid access to important and frequently used destinations. You can configure additional external devices. Associated contact information is stored by Name and Type (Computer or Radio).

Contact List

Select [...] to access the Contact List dialog.



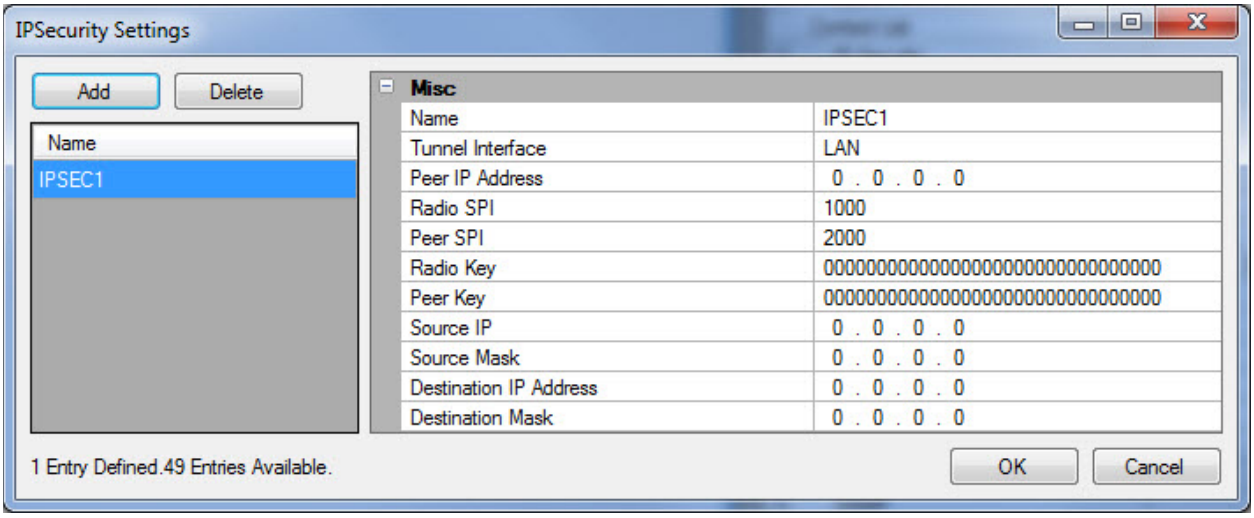
Select the **Add/Create**... drop-down list to create a Combined Contact (Radio, Computer), Radio Contact, or Computer Contact. Add up to 25 contact list entries for each type. Modify a user-created entry contact information as required.



Select the **Remove...** drop-down list to remove a user-created entry.

IP Security

Select [...] next to IP Security Settings to access the IP Security Settings dialog. Security on Wireless IP network routes may be assigned using the IP Security settings.



Select **Add** to create up to 50 IP security definitions. Select **Delete** to remove a selected security definition.

Name - Input name. The maximum ID length is 15 characters.

Tunnel Interface - Select **LAN** or **Wireless** as the radio interface to define the tunnel on.

Peer IP Address - Set IP address of the tunnel peer.

Radio SPI - Set Security Parameter Index (SPI) for outbound data from the radio. This has to be unique value from 256 to 4294967295 for each tunnel.

Peer SPI - Set SPI for inbound data to the radio. This has to be unique value from 256 to 4294967295 for each tunnel.

Radio Key - Set value to a 32 character hex string. This is the 128-bit AES encryption key for outbound data from the radio.

Peer Key - Set value to a 32 character hex string. This is the 128-bit AES encryption key for inbound data to the radio.

Source IP - Set the source network or host IP address behind the radio that should pass through the tunnel.

Source Mask - Set the source network or host IP subnet mask.

Destination IP Address - Set the destination network or host IP address behind the tunnel peer that should pass through the tunnel.

Destination Mask - Set the destination network or host IP subnet mask.

Telephony

The following attributes apply for the station Telephony property.

These properties will appear when the station is in a Telephony-enabled network. This is a network where the Telephony Gateway property is set to Enabled. This is configured under S-TNW > Preset > Advanced > Telephony Gateway for example.

Phone Prefix

A four digit number that is plan-wide unique. This is a generated value that is incremented from the last value assigned to the next unused value. If last assigned property value is 9999, the extension will be the next available number restarting count at 0001. The first value assigned is 6000. If the station is not designated as a Telephony Gateway and when the station is not in a Local Area Network, the Station Phone Prefix value will be 0000.

Phone Book

Configure the Phone Book, which includes IP Routes table and MAC Routes table.

IP Routes

Select ... to add IP routes. Up to 255 phone book entries can be defined by **Phone Number** and **IP Address**. Manually added route entries are for advanced users and are not validated against plan data.

Group Entries

Select ... to view auto-generated Group Entries. Auto-generated entries are based on talk group membership. Unique numbers are generated. However, you are not prevented from creating duplicate phone numbers.

Name

The name of this group entry is displayed. Using the S-TNW Network Creator example, the two group entries for station D1 would be TALKGROUPDSTNWNET1 and PRIORITYVOICESTNWNET1.

Phone Number

A four-digit number that is a plan-wide, unique generated value that is incremented from the last value assigned to the next unused value. Last assigned property value of 9999 - the extension will be the next available number restarting count at 0001. Numbers starting with 911 are not allowed. The first value assigned is **4000**.

Net Association

The net associated with this group entry is displayed.

VoIP (Channel Configuration)

Use the VoIP property to customize VoIP settings and configure channels. These settings are Advanced User Options.

Max Packet Size

Real-Time Transport Protocol (RTP) is used to set up the maximum amount in bytes of RTP data to send at once. Configure the maximum size of RTP G.711 audio packets that will be transmitted. The default is 160. Possible values are 100 - 800.

RTP RX Latency

An Rx RTP stream is held off until this much data is buffered (in ms). The value is 300 for Default (RF) mode, 1500 for BGAN Mode, and is configurable in Manual Mode.

RTP RX Timeout

An Rx RTP stream times out if no packets are received in this much time (in ms). The value is 700 for Default (RF) mode, 5000 for BGAN Mode, and is configurable in Manual Mode.

Voice Latency

Set the Mode for RTP latency, based on roundtrip IP packet time. Choices are: Default Mode (RF), BGAN Mode, Manual Mode.

Net Phone Number

The 4-24 digit phone number associated with this particular net.

Channels

Select  to open the **Channel Configuration** dialog to enter up to 10 channels used to communicate to each other or to media servers. Select **Create** to create a new channel and configure the following attributes. Edit each field by selecting the field and over-typing as required.

Name - The Channel Name is assigned automatically during initial channel creation (for example, CHANNEL1, CHANNEL2, etc.). Change as required.

Transmit IP Address - Enter the destination IP address for single-radio retransmit or an IP multicast address for multi-radio retransmit. The default is 226.0.0.0. The IP address range is 224.0.0.0 - 239.255.255.255; however, IP addresses 224.0.0.0 - 224.0.0.255 inclusive are reserved for routing protocols and other low-level topology discovery or maintenance protocols such as gateway discovery and group membership reporting. Multicast routers should not forward any multicast datagram with destination addresses in this range, regardless of its Time To Live (TTL).

Transmit Port - Enter a valid IP port on which to transmit audio. Valid values are even numbers greater than 1024 and less than 65536 (the default is 5000).

Receive IP Address - Enter a valid IP multicast address on which to receive audio. The default is 226.0.0.0. The IP address range is 224.0.0.0 - 239.255.255.255; however, IP addresses 224.0.0.0 - 224.0.0.255 inclusive are reserved for routing protocols and other low-level topology discovery or maintenance protocols such as gateway discovery and group membership reporting. Multicast routers should not forward any multicast datagram with destination addresses in this range, regardless of its TTL.

Receive Port - Enter a valid IP port on which to receive audio. Valid values are even numbers greater than 1024 and less than 65536 (the default is 5000).

DTMF - Enable or disable DTMF signaling to control full-duplex calls, using "*" for key events and "#" for unkey events.

Codec - Select the codec to use when transmitting on the channel: PCMU, PCMA, or G.729. If G.729 is selected and older radios are programmed, PCMU will be used.

Receive Only - Select whether or not audio can be transmitted on the channel. Transmission is not allowed on this channel when Receive Only is enabled. For general-purpose communications, you would normally disable this setting.

Mute Audio - Select whether or not audio received on this channel will be output to the radio speaker/headset/auxiliary port. When audio is muted, it will not be heard on the front panel speaker, but will continue to be rebroadcast.

Payload Types - Configure the RTP profile for generating dynamic rtpmap attributes of the Session Description Protocol (SDP) for a VoIP call.

CVSD Payload Type - Configure the dynamic payload type for CVSD encoding. Valid values are 96 - 127. The default is 98.

DTMF Payload Type - Configure the dynamic payload type used for DTMF signaling. Valid values are 96 - 127. The default is 96.

MELP Payload Type - Configure the dynamic payload type for MELP encoding. Valid values are 96 - 127. The default is 99.

Messenger

The radio allows for expansion of SMS Messages and Alerts to the Messenger navigation feature. Up to 10 SMS messages can be entered and stored per station.

SMS and Alert messages assigned to the current station can be copied to all stations of the same type or to another specified station.

> **NOTE -** Arabic text entries for Network Names, Station Names, and Contact List names, are limited to half the length allowed for English text entries.

SMS - Expand the SMS group to configure the Short Message Service (Legacy Mode):

Text Prediction

When enabled, the radio will use words and phrases from the SMS Training Data file loaded in the radio to suggest a letter or word that the operator might type next in an SMS message.

Messages

Select ... to get the SMS Configuration dialog to enter up to 10 Short Messages (maximum of 160 bytes) per station.

Import - Allows you to import messages from VHF-UHF RPA Plan Files (.vpd) and Common Plan Files (.cpf). Select **Import**, then use the **Browse** button to navigate to the .vpd or .cpf file you want to import, then select **Open**.

Copy To - Allows you to copy messages to other radios in the plan. Select the destination radio on the drop-down list, then select **Copy To** to copy messages to the destination radio. If **All RF-78xxx Stations** (where xxx is the radio type) is selected in the **Copy To** drop-down list, then the messages will be copied to all radios of type xxx at once.

Alerts - Expand the Alerts group to configure Alert messages:

Keywords

Enable or disable Keywords NAME and LOC that will be substituted with the current sending radio's name or GPS location (if available) when the message is sent.

Forward Alerts

Enable or disable the forwarding of alert messages to a specific Tac Chat IP address.

Alert IP

Enter a specific Tac Chat IP address where alerts are to be sent.

Messages

Select ... to get the Alerts Configuration dialog to enter up to 6 Alerts (maximum of 160 bytes). The user is also allowed to insert a Geographic “Location” {LOC} tag and a Radio “Name” {NAME} tag into any selected Alert message. When a message containing a {LOC} tag or a {NAME} tag is transmitted, the radio will substitute the current GPS coordinates for the location tag and the radio name for the name tag.

Import - Allows you to import messages from VHF-UHF RPA Plan Files (.vpd) and Common Plan Files (.cpf). Select **Import**, then use the **Browse** button to navigate to the .vpd or .cpf file you want to import, then select **Open**.

Copy To - Allows you to copy messages to other radios in the plan. Select the destination radio on the drop-down list, then select **Copy To** for copying messages to the destination radio. If **All RF-78xxx Stations** (where xxx is the radio type) is selected in the **Copy To** drop-down list, then the messages will be copied to all radios of type xxx at once.

Net Switches

The Net Switches property defines which network is accessed when the radio's rotary switch is set to positions 1 through 13.

> **NOTE -** The Net Switches should not be configured until all Networks are created.

Switch 1 - Switch 13

Use the drop-down list to select the net to be used by the radio when its Rotary Switch is placed in position 1 through 13.

Broadcast Gateway

The Broadcast Gateway property identifies the IP address to which the radio will forward broadcast IP packets. When the radio receives a broadcast IP packet on its wireless IP interface, it will forward that packet to the Broadcast Gateway if this property is configured.

Select on the IP address and enter the value to set the **Broadcast Gateway**. Advance to the next octet by pressing the Tab key or Period key.

Anc. Connector Mode

This property identifies the usage of the 14-Pin Data Connector for the RF-7850S. This connector provides an interface for various remote data devices that can be connected to the radio.

Choices are:

Auto - The 14-Pin Data Connector is enabled or disabled automatically depending on whether equipment is physically connected or not.

On - The 14-Pin Data Connector is enabled whether or not equipment is physically connected.

Time And Date Settings

This property configures the date and time settings.

Date Format

Select date format. Choose Month-Day-Year (**MM-DD-YY**), Day-Month-Year (**DD-MM-YY**), Year-Month-Day (**YYYY-MM-DD**), or **Zulu**. The default is YYYY-MM-DD.

UTC Hour Offset

Enter local time difference from UTC between -12 and 12 hours. The default is 0 hours.

UTC Minute Offset

Enter local time difference from UTC between 0 and 60 minutes. The default is 0 minutes.

UTC Second Offset

Enter local time difference from UTC between 0 and 60 seconds. The default is 0 minutes.

VOX Settings

Enable VOX - Enable or Disable. Voice Activated Transmission (VOX) specifies which key source will be used for transmission once sound is detected and voice-operated transmit commences. Use of this feature allows the radio to automatically transmit when the user speaks and stops transmitting, when they stop speaking, and can be used instead of a push-to-talk button. Automatic Level Control (Voice Settings) should be disabled for VOX to function properly.

VOX Pre-Key Audio - Sets how much audio to send out that was recorded prior to voice-operated transmit commencing (keyline). Enter a value from 0 to 500 ms as the amount of audio to transmit.

VOX ON Hysteresis - Enter a value from 5 to 500 (in 5 ms intervals). Specifies how long the audio level should be above the VOX Threshold (automatically determined by the radio) before VOX is activated. The default is 50 ms.

VOX OFF Hysteresis - Enter a value from 5 to 2500 (in 5 ms intervals). Specifies how long the audio level should be below the VOX Threshold (automatically determined by the radio) before VOX is deactivated. The default is 750 ms.

VOX Sensitivity - Sets the gain on the VOX voice filter. Range is 1 to 10.

Voice Settings

The Voice Settings property permits the setting of various voice-related features of the radio. These settings include:

Volume

This sets the volume level (from 1 - 10) for the radio speaker and/or headphones. The default is 6. This setting can still be adjusted manually by the radio operator as required.

Automatic Level Control

Set this property to **Enabled** to use Automatic Level Control, which automatically controls output power to the speaker. Automatic Level Control prevents loudspeaker overload and optimizes dynamic range.

Headset Sidetone

Set to **Enabled** to permit Sidetone over the radio headset. Sidetone is recommended for voice communications.

Audible Indicators

Set to **None**, **Default**, or **Hands Free**. The default setting on the radio is Hands Free. Default permits audio prompts and beep alerts to alert user of radio status. This property covers all radio audible indicators including MELP RX Beeps, hold-off tones, etc. MELP post RX Audio beeps sound after the radio has completed processing of received audio when using MELP.

Headset

Enable or disable the audio headset connector.

Headset Voltage

Select **5.0V** or **Voltage Disabled**.

Headset Microphone Gain [dB]

Select **6**, **12**, **18**, **24**, or **30**.

Operation Mode

USB connectivity permits numerous options for interconnection. For example, the radio can be used with peripheral devices such as a web camera. The radio can also connect to a PC/laptop for programming using USB connectivity.

The Operation Mode property configures this USB connectivity. Select USB Mode or Peripheral Function.

USB Mode

Select the mode that the USB connection operates in. Choices are:

Auto - Radio tries to determine what is connected based on the 5th pin being grounded. Type A USB cables typically have the 5th pin grounded, and are used on devices such as a printer, keyboard, mouse, or MP3 player. The default is Auto.

Host - Radio is configured as a USB host and will automatically mount supported devices such as Ethernet adapters, cameras, and flash drives.

Peripheral - Radio is configured to be a USB mass storage device (flash drive) and can be used as a USB device plugged into a PC, PDA, notebook, or tablet.

Off - All USB functionality is disabled.

Peripheral Function

Select how the USB device will be used: as a storage device or Remote Network Driver Interface Specification (RNDIS) device.

NOTE - Peripheral Function becomes available when USB Mode is Auto or Peripheral.

Storage Device - The radio will act as a flash drive when plugged into a USB host.

RNDIS Device - The radio will act as a Remote NDIS device when plugged into a USB host. When RNDIS is connected and operational, two network interfaces are created, one on the USB host and one in the radio. The host uses a DHCP client to configure its interface. The radio must run a DHCP server bound to its interface.

RNDIS Config - Expand the RNDIS Config group to configure the RNDIS parameters.

Configure Peer

Enable when the RNDIS interface on the PC/PDA will use a DHCP client to obtain configuration (recommended). Disable when manually configuring the RNDIS interface on the PC/PDA.

Local IP Address

Input local radio address.

Remote IP Address

Input remote PC/PDA address.

Mask

Configure the Subnet Mask for the local interface (and remote interface when using DHCP server).

Remote Gateway

Configure the Remote Gateway - the default gateway setting to configure the remote machine (PC/PDA) with, typically set to Local IP address.

NOTE - Remote IP Address and Remote Gateway are only available when Configure Peer is enabled.

User Interfaces

The User Interfaces property allows the configuration of numerous Front Panel and Web-Interface settings.

Remote KDU - Expand to set the following parameters:

Retain Login - This setting controls whether or not the user remains logged in when using the KDU. When set to Enabled, the user remains logged in after a power cycle. If set to Disabled, the user must log in upon every power-up or power cycle.

Backlight Level - Enter the backlight level (from 1 - 10) for the KDU panel display. Default value is 7.

Contrast - Enter the contrast level (from 1 - 10) for the KDU display. Default value is 6.

Backlight Mode - Enter the backlight mode level for the KDU display. Choices are Momentary, Enabled, or Disabled. Default setting is Momentary.

Backlight Time [s] - If Backlight Mode is set to Momentary, this setting controls how long the backlight remains on (from 1 - 5 seconds). Default value is 5.

Web Interface - Web Interface settings include:

Web Server - When set to Enabled, the radio acts as a web server to the User Interface (UI).

SSL Encryption - When set to Enabled, the UI encrypts data with SSL protection.

Public Port - This is the port number to bind to if SSL Encryption is Disabled. Default setting is 80.

Secure Port - This is the port number to bind to if SSL Encryption is Enabled. Default setting is 443.

Session Timeout [min] - This is the maximum time a session will stay idle prior to logging out (in minutes). Zero (0) specifies no session timeout. Default setting is 20.

Map URLs - Add or Delete http:// web address, also known as Universal Resource Locator (url) paths, for the web interface.

Retain ASCII Remote Login - This setting controls whether or not the user remains logged in via ASCII remote. If set to Enabled, the user remains logged in after a power cycle. If set to Disabled, the user must log in upon every power cycle.

Language Settings - Refer to **Language Settings** for more information. Language settings include:

Display Language - The language the GUI displays.

Input Language - The language the user inputs data in.

Language Settings

For certain properties within CPA, you may display or input text in languages other than English.

English and Arabic are currently supported as display and input languages for the radio. A Custom Translation display language is also supported (requires custom firmware).

Note that the properties within CPA that support text input in languages other than English are:

- Station Information > Name
- Messenger > SMS > Messages dialog
- Messenger > Alerts > Messages dialog
- Features > Contact List dialog
- Network Information > Name

Configure PC for a Different Language

> **NOTE** - Setup to enable text input in different languages is done on your computer, and not within CPA itself.

These steps are for a PC running Windows 7. The process for enabling a new keyboard on other Windows operating systems is similar.

Enable a new language keyboard on your computer:

1. Select **Control Panel** > **Region and Language** > **Keyboards and Languages > Change keyboards...** > **Add**.
2. Select the check box next to the language you wish to add and press **OK**.
3. Select **OK**.
4. Observe a language code icon in your system tray.

Enter text using the new keyboard:

1. Select the language icon in the system tray.
2. Select the check box next to the added language.

Black Repeater

The ability to identify a radio as Black Repeater station is supported in FF/LOS nets with simple retransmit set. One radio in the FF/LOS net is set as the black repeater station. A second simple retransmit net is also set up with a black repeater. The two black repeater radios are connected using Retransmission Cable 12164-0721-A006. The CPA does not make this connection if you were to show this in a topology view.

Stations enabled as a Black Repeater can be used in a network for range extension only and do not get loaded with encryption keys or CAM when programmed. The repeater radio is set for Plain Text (PT) mode and can be unattended. The radio does not decrypt information, but passes it along encrypted from its source.

The Black Repeater property is set as follows.

1. Open Advanced under Network Information.
2. Select  to the right of Retransmit.
3. Select the radio that will be a Black Repeater in the Retransmit Configuration dialog.
4. Set **Retransmit** to Enabled.
5. Set **Retransmit Mode** to Simple for a FF/LOS net.

   NOTE - Simple is only available if Channel Access is None.

6. Select **OK**.
7. Set the station **Black Repeater** property of the radio to Enabled.

Combat ID

Enter a numeric Combat Net ID (CID) of 0 to 524287. This is used to identify the radio with compatibility mode SA reporting.

SNMP

This property configures the Simple Network Management Protocol (SNMP) settings.

> **NOTE** - If FIPS is enabled, SNMP v1/v2c is not allowed. Also, MD5 and DES are not supported for SNMP v3. Only SNMP v3 using SHA and AES 128 is supported.

SNMP Protocol Version

Choose **SNMP v1/v2c**, **SNMP v3**, or **SNMP Disabled**. The default is Disabled.

SNMP v1/v2c Community String

Enter a Community String as required. The default is Private.

SNMP v3 Authentication Protocol

Select Message Digest Algorithm 5 (**MD5**) or Secure Hash Algorithm (**SHA**). The default is MD5.

SNMP v3 Data Privacy Protocol

Select **DES** or **AES 128**. The default is DES.

SNMP v3 Authentication Password

Enter a password as required. The default is HARRISRF.

SNMP v3 Data Privacy Password

Enter a password as required. The default is HARRISRF.

Allow Traps

Select **Yes** or **No** to allow traps. The default is No.

Trap Destination IP Address

If traps are allowed, enter the destination IP address.

FIPS

When enabled, the station is configured to use FIPS-compliant algorithms for encryption.

Federal Information Processing Standard (FIPS) Publication 140-2 is a computer security standard issued by the National Institute of Standards and Technology (NIST) to accredit cryptographic modules for government computing platforms. FIPS standards provide an increased level of network security.

Global Settings - Radio

Global Radio Settings Overview

The **Global Settings** area of the Properties pane permits the configuration of settings that are common to all radios being programmed, regardless of net membership.

Features that can be configured from the **Global Settings** area of the **Properties** menu include:

- Global SMS
- Radio Passwords
- GPS
- Custom GPS Reporting
- Locksets

Global SMS

The Global SMS menu provides selection and programming of SMS Training Data. SMS Training Data is contained within the plan and is used to make entering text messages faster. This feature allows a radio to recognize words as they are entered and prompt the user with suggestions. As you enter an SMS message from the front panel of the radio, you will be prompted for the next likely letter based upon the words in the SMS Training Data. This feature speeds up the entering of SMS messages. SMS files can be imported and saved to any SMS capable station in the network.

SMS messages are created under Messenger > SMS > Messages.

To add content to the SMS Training Data, create a training text (*.txt) file:

1. Open an application that creates a text file, such as Microsoft Notepad.
2. Enter a list of words or phrases you want to be recalled when typing SMS messages.

   NOTE - Each word or phrase should be separated by a space. Text file entries are not case sensitive (Harris, HARRIS or harris are all acceptable).

3. Select the training file and save it as a text file (*.txt) to an accessible location, ensuring the file is saved using ANSI Encoding (this is the default encoding method used by the Notepad application).

Import SMS Training Data:

1. Create an SMS data file (or use an existing SMS data file) and save it to a specified location as a *.txt file.
2. Select **Global SMS u**nder Global Settings in the Properties pane.
3. Select ... to open the **SMS Training Data** dialog.
4. Select **Import**.
5. Select the SMS file created in Step 1. A dialog screen displays “Successfully processed SMS training data file.”
6. Select **OK** when done.

The imported data is shown as text in the SMS Training Data dialog. Each subsequent import of SMS training data will over-write the plan’s previous SMS training data.

Delete SMS Training Data:

1. Select **Delete** to clear entire text.
2. Select **OK** when done.

Radio Passwords

This menu area controls the passwords used by the radio. A summary of the current settings can be viewed in the field to the right of **Radio Passwords**.

> **NOTE** - Level 4 password cannot be configured. This is a maintenance level function (purchased) for diagnostics, BERT, calibration settings, and ASCII Remote.

Use Default Passwords

Set to **Enabled** to use the default passwords. If this property is **Disabled**, new passwords can be created for each level. Separate menu items display for each password level on the radio.

Level 1 Password, **Level 2 Password**, **Level 3 Password**

Input the required password for each password level on the radio. Select **OK** when done entering the password.

> **NOTE** - Blank characters are not allowed in passwords for any level.

The radio uses the following default password levels. The default password is listed below in brackets. **<Password not set>** will be displayed for each password level until the password is entered.

Level 1 (Operator) - Can only change items such as backlight, contrast, and volume. Can override but not save net parameters [HH01].

Level 2 (COMSEC) - Can perform Level 1 functions, additional programming and update encryption [HH02].

Level 3 (Communications Officer) - Can perform Level 2 functions plus program firmware, fill radio, and manage Customer Algorithm Modification (CAM) settings [HH03].

GPS

On radios that support this feature, the operator can activate the internal GPS receiver. The GPS receiver provides geographical location information for display by the radio, and is used for Situational Awareness (SA).

The Global GPS menu permits selection of Position Format, GPS Datum points, Linear Units, Elevation Format, Angular Units, and Sleep Cycle settings.

The GPS datum point can be selected from a drop-down list, or from user-created datum points (Custom Datum 1 - 4).

Operational Mode - This property identifies the type of GPS input being used by the radio. Choices are:

- **Internal** - Select if the radio is equipped with an internal GPS receiver.
- **External** - Select if an external GPS receiver is being used.
- **None** - Select if GPS is not being used by radios in this communications plan.

Position Format - Using the drop-down list, select the appropriate GPS Position Format:

- **Latitude/Longitude: dd'mm.mmmm** (degrees and minutes). This format is the default setting.
- **Latitude/Longitude: dd'mm'ss.ss** (degrees, minutes, and seconds).
- **Military Grid Reference System** (MGRS).

  NOTE - When Military Grid Reference System is selected, several Datums, including Custom Datums, are not available on the Datum drop-down list.

- **Universal Transverse Mercator** (UTM).
- **Netherlands East Indies** (NEI).

Datum - To use the GPS receiver in conjunction with a paper map, the same datum must be used for both. Choose a Datum from the drop-down list that corresponds to the map's datum.

NOTE - When Position Format is Military Grid Reference System, only Datums that are MGRS-compliant are available on the Datum drop-down list.

Linear Units - Using the drop-down list, choose the Linear Units that will be used for the display of distance, altitude, and velocity. Choices are:

- **Metric Units** (uses meters and kilometers)
- **Nautical Units** (uses knots and nautical miles)
- **Statute Units** (uses feet and miles)

Elevation Format - Select either **Relative to Mean Sea Level** or **Relative to Current Datum** from the drop-down list.

Angular Units - Select the appropriate value from the drop-down list.

- **Degrees Referenced to True North**
- **Mils Referenced to True North**

Sleep Mode - Select the desired Sleep Mode setting. To save power, the GPS receiver will enter a low power state for this duration of time. On awakening, a new set of readings will be taken and displayed and the GPS receiver will then go back into low power mode. Select **Automatic** or **None** as required.

> **NOTE -** This field is only available when **Internal** GPS Operational Mode is selected.

Custom Datum 1 - Custom Datum 4

Up to four custom datum points can be configured.

Set datum points:

1. Select the [+] sign to expand the **Custom Datum** menu.
2. Select each field, entering:
    - **Semi Major Axis (m):** 6300000.0000 to 6400000.0000 meters.
    - **Inverse Flattening**: 280.000000000 to 320.00000000 meters.
    - **Delta X**, **Delta Y**, and **Delta Z:** 0 to 9999 meters from WGS 84.

    > **NOTE -** WGS 84 is the official horizontal datum for use in the North and Central American geodetic networks.

3. Select outside the fields when done.

Custom On-Demand Audio Reports

Each of the following reports are generated by pressing the OK button twice and then pressing the button assigned to the audio report (must be done in two seconds after double pressing the OK button).

Button choices for the following are: Disabled, PTT1, PTT2, Volume UP, Volume Down, Headset PTT1, or Headset PTT2.

Man Down Alert

Select the button required to send a man down alert.

On Demand GPS Audio Report

Select the button required to initiate an on demand GPS audio report.

GPS Audio Report Precision

Select on-demand GPS audio report read back precision using the following criteria:

- 100 = 6 digits read back
- 10 = 8 digit read back
- 1 = 10 digit read back

Battery Status

Select the button required to report battery status.

Play Last Reception

Select the button required to play last received audio.

Locksets

A lockset specifies a range of frequencies that will not be used during frequency hopping operations. The locksets apply globally to each radio type in a plan. Up to 25 locksets can be defined. Locksets are supported in all radio types using frequency hopping.

> **NOTE -** Locksets are used to prevent transmissions that might be illegal on certain frequencies (commercial or special purpose frequencies) in some jurisdictions.

Set up Locksets:

1. Select  next to **Locksets**. The Locksets dialog displays.
2. Select **Add**. A default Lockset is added with the same Start and Stop Frequency. This limits the Lockset to a single 25 kHz channel.
3. Perform the steps above as required for any additional locksets (maximum of 25).
4. Select **Close** when done.

The lockset information will be stored when the plan is saved.

Edit Locksets:

1. Select the value to be changed in an existing Lockset.
2. Enter a frequency between 30.000 and 107.975.
3. Select **Close** when done.

Delete Locksets:

1. Select the Lockset(s) you want to remove in the Locksets dialog.
2. Select **Delete**.
3. Select **Close** when done.

Network Settings

Basic Network Types Supported

Basic network types supported include the following.

- Fixed Frequency/LOS
- LAN
- S-TNW

  NOTE - Refer to S-TNW Network Creator to simplify parameter choices when building a new S-TNW network.

- TNW

  NOTE - Refer to the Communications Planning Application for TNW Help for more information.

Network Information

The Network Information area can be used to store descriptive information about the network. Select the fields and enter text as required.

Network Name

The Network Name is assigned by the program during initial network creation. This may be changed by the user as required. Names can consist of any combination of 1 - 15 uppercase letters and/or digits. Changes typed in this field also display in the network tab of the center Network View on the CPA.

Network Description

(Optional) Enter a description (maximum of 256 characters) of the network. Select the field, then use the drop-down arrow to expand the text area. It can be helpful to include the Date-Time Group (DTG) of the CPA plan to assist operators to identify the most recent version.

Network Notes

(Optional) Enter any additional notes here (maximum of 256 characters) as required.

Fixed Frequency LOS

General Information FF/LOS

Fixed Frequency nets are used for basic Line Of Sight (LOS) communications.

Application Options

Select **Tools > Applications Options...** to set default options for Fixed Frequency/LOS.

Name Prefix - FFNET is default 1-12 character alphanumeric. Networks are created as FFNET1, FFNET2, etc.

Show Warning Dialog - Select **Yes** to see warnings when modifying the network.

Network Information

Refer to Network Information for Name, Description, and Notes properties.

Preset Properties

The network preset type is Fixed Frequency/LOS and cannot be edited. Expand Preset to view Fixed Frequency/LOS network properties.

General

COMSEC

Data/Voice (Traffic)

Squelch

Advanced

General FF/LOS

The General category sets the basic net frequencies and default power level for Fixed Frequency nets.

RX Frequency [MHz]

Type the RX frequency. The range for Fixed Frequency nets depends upon the radio type(s) used within the net, and is automatically limited to a valid range.

Receive Only

For radio frequency emission control and silent radio operations with transmit capability inhibited, Receive Only should be set to Enabled. Keep this feature disabled for full transmit and receive capability. When enabled, Configure RX Override is available.

Configure RX Override property support is available when Receive Only is enabled. Select ... to access the **Advanced RX Override Settings** dialog and override the default station Receive Only Status setting as Network, Enabled, or Disabled for each station in the net.

TX Frequency [MHz]

No entry is required for normal net operations. The program automatically sets the TX frequency to the same value as RX frequency. Different RX and TX frequencies may be required in certain situations such as retransmit or repeater operations. For these cases, the user should manually enter the proper TX Frequency.

TX Power

Select the appropriate transmit power level (**High**, **Medium**, or **Low**) from the drop-down list.

Bandwidth [kHz]

Set at **25 kHz**.

Channel Access

Simultaneous voice and GPS data can take place on a Fixed Frequency net with the Channel Access set to **None**.

Comsec FF/LOS

The Communications Security (COMSEC) category sets the encryption type for the net.

Keys must be generated and in the plan before any Crypto selection will be active. Refer to Manage Keys for instructions.

Crypto Mode

Shown when Crypto Algorithm property value is not None. This is automatically set to MINERR.

Crypto Algorithm

Selections for RF-7850S radios are: **None** and **AES 256**, based on the availability of keys.

Select **None** for PT crypto type operation. For example, an external encryption device is being used.

CT is available when the Crypto Algorithm property value is associated with a key.

Key Name

Shown when the Crypto Algorithm property value is not None. This property is restricted to names of existing keys of the type specified by the Crypto Algorithm property. For example, if only the default AES1 is configured, then this value is set to AES1. For multiple keys, use the drop-down list to select the Key Name (i.e., AES1, AES2, AES3). Use **Tools > Key Management** to configure keys.

Data/Voice (Traffic) FF/LOS

The Data/Voice category sets the modulation parameters for the net.

Allow Voice

This setting controls whether voice communications are permitted within the network. Select **Enabled** to permit voice communications or **Disabled** if only data communications are being used.

Info Type (Traffic)

The type of traffic supported by this network is set as follows.

Info Type is restricted to **Data** when Allow Voice is set to Disabled.

Info Type is restricted to **Voice** when Allow Voice is set to Enabled and Allow Reporting is set to Disabled.

Info Type is set to **Data/Voice** when Allow Voice is set to Enabled, and Allow Reporting is set to Enabled.

Voice Mode

Select **CVSD**, **Clear**, or **MELP** as required.

> **NOTE -** MELP is the default and typically provides the best performance. Clear is only available under certain conditions (for example, when Crypto Algorithm and Channel Access are set to **None**).

FM Deviation [kHz]

Select **5 kHz**, **6.5 kHz**, or **8 kHz** deviation when bandwidth is 25 kHz and modulation is FSK.

Baud Rate [bps]

With Channel Access set to None, the Bandwidth [kHz] setting is set to 25, and the Baud Rate [bps] field is 16000.

Modulation

Modulation type for network is **FSK**.

FSK Preamble

> **NOTE -** This setting is only available for simple Fixed Frequency nets (Channel Access set to None).

A Frequency Shift Keying (FSK) Preamble provides signaling information on the contents of an FSK signal transmission, and is required for proper de-coding of this type of signal. Choices are: Default, Short, or Robust. Select FSK Preamble length depending on channel conditions. Preamble must be the same in all radios in the network.

- **Default** is appropriate for all modes except as described for Robust and Short.
- **Short** is used for excellent signal transmission environments and if power management is disabled.
- **Robust** is used for a poor transmission environment is encountered, when transmitting to a radio that is scanning, or when transmitting through an RF-5800V retransmit site.

Squelch FF/LOS

Squelch is a feature that quiets the radio receiver until the strength of a received signal exceeds a specified level. Squelch is normally only used for voice communications.

For analog signals, squelch functions by measuring the level of a transmitted tone or noise. For digital signals, a digital squelch system is designed to recognize a digital code that is transmitted with the signal.

TX Squelch Type

This field will only display if Channel Access is set to None and if COMSEC is set to None.

Squelch options can include **None** or **Tone**. The TX Squelch Type property can be edited only when Modulation is set to **FSK**.

RX Squelch Type

Squelch options available include **None**, **Noise, Tone**, or **Digital**. Squelch options available vary based on channel access, modulation, crypto algorithm, and TX squelch type.

Advanced FF/LOS

The Advanced category is used to set up per-station transmit power override on all radio types, and to enable special features.

TX Power Override

GPS - Expand the GPS group to view properties.

Retransmit - Select ... to the right of **Retransmit**.

Local Area Network

LAN General Information

A Local Area Network within CPA permits additional data communications devices to be part of a communications plan. Devices on each LAN can be reached by other users within the communications plan.

LAN Preset

These fields display the Network information. Values are automatically assigned by CPA when the LAN is created.

Address Type

Select **Dynamic** or **Static** (default).

Subnet

Defines the Network ID.

Mask

Number of device IDs that can exist in the network.

Gateway

Address for routing IP traffic without known routes.

> **NOTE** - These fields may be edited by selecting the field and typing the new required value. The user will be prompted if the new value is invalid.

Additional Networks

After selecting ..., the user can define additional subnets that can be reached from that LAN. Routes to those subnets will automatically be generated for stations that can reach that LAN.

To use this dialog:

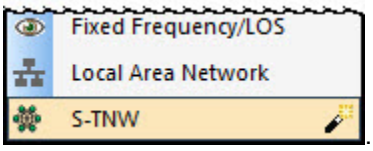
Select **Add** and type the Subnet and Mask for the Additional Network, then select **Submit**.

Select **Modify** to make changes to existing Additional Networks.

Select **Remove** to delete existing Additional Networks.

S-TNW Network Creator

Create a S-TNW network based on a filtered list of options and number of stations using the S-TNW Network Creator. This tool simplifies parameter choices when building a new network by providing the parameter structures described below.

1. Navigate to S-TNW from the menu bar by going to **Create Network** to make a network selection.
2. Select **S-TNW** 

.
3. Observe that the S-TNW Network Creator opens (a completed sample screen is shown at the bottom of this topic).
4. Select **Go To Empty Network** if you do not want to use the tool; otherwise, continue configuration.
5. Configure the following **General** parameters.
   a. Configure **Frequency [MHz]** to a value of 225.0 MHz to 2.0 GHz.
   b. Select **Wideband Channel [MHz]** and set bandwidth as 1.2 MHz or 5.0 MHz.

      NOTE: The maximum number of stations per network is 48.

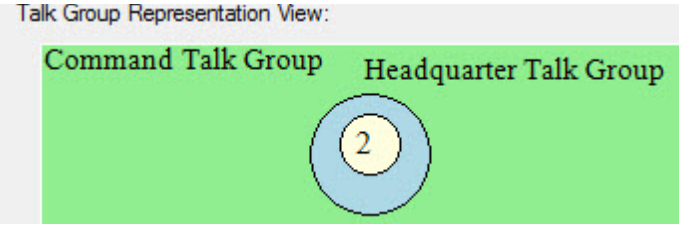
   c. Configure the **Voice Duplex Mode** as Full Duplex (3 talk groups maximum) or Half Duplex (6 talk groups maximum). Adjust the number of talk groups to a lower number if Full Duplex is not selectable.
6. Configure the following **COMSEC** parameters.
   a. Configure **Manage Keys** by selecting … and configuring keys as required using the Key Manager.
   b. Select AES-256 as the **Crypto Algorithm**.
   c. Select an AES-256 **Key Name** from the list of generated keys.
7. Configure the following **Talk Group Configuration** parameters.

      NOTE: Command Talk Group and Headquarter Talk Group are included in the total number of six talk groups allowed.

   a. Configure the number of **Non-Command Talk Groups** to a value of 1 to 6 (this does not include the Command Talk Group and the Headquarter Talk Group if enabled).
   b. Configure the number of **Stations Per Talk Group** to a value of 0 to 48 that represents the total number of leaders and members. The upper limit will be lower depending on what you have configured.
   c. Configure the number of **Leaders Per Talk Group** to a value from 1 to the maximum number of Stations Per Talk Group.
   d. Observe the **Members Per Talk Group** is the difference between the Stations Per Talk Group minus the Leaders Per Talk Group. The number will change based on Stations Per Talk Group for example.
   e. Configure the **Command Talk Group** to Enabled or Disabled. When enabled, the Command Stations and Internal Command Talk Group items are configurable and a Command Talk Group can be assigned in Select Talk Groups.
   f. Configure the **Command Stations** to a value of 0 to 48.

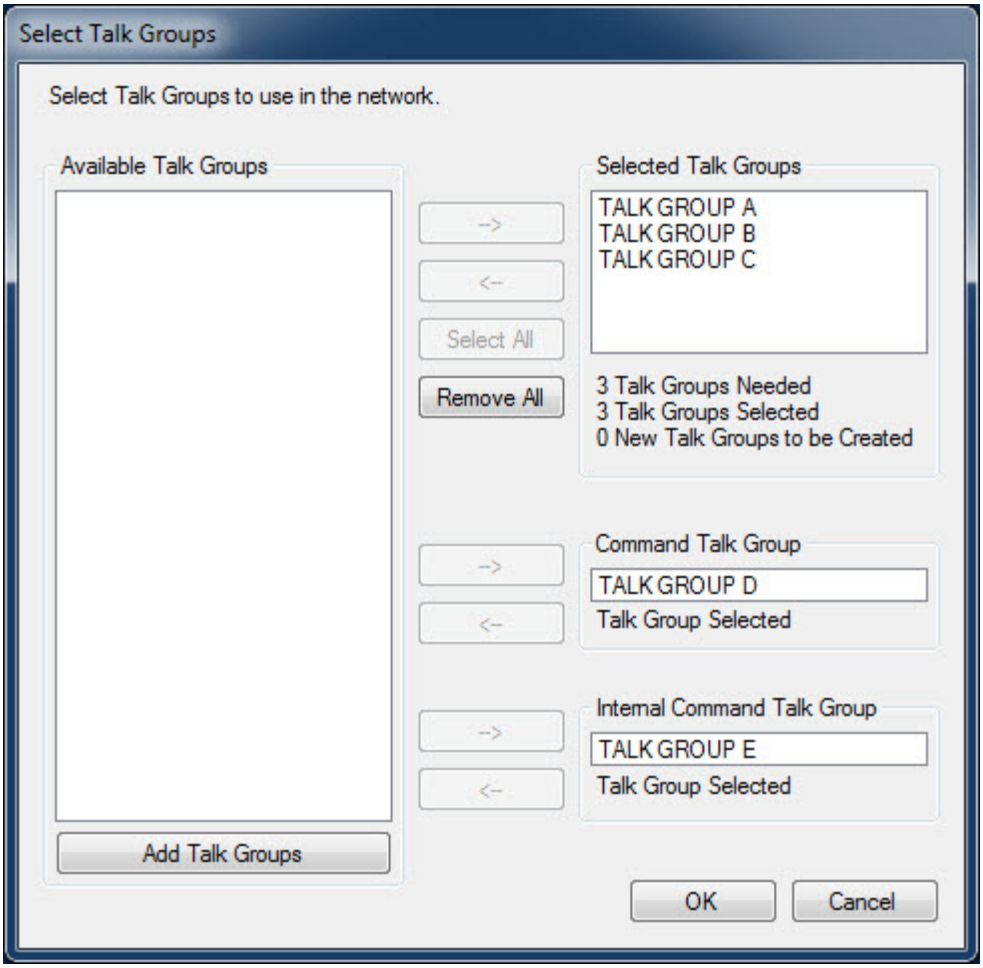
g. Configure the **Internal Command Talk Group** to Enabled or Disabled to make a Headquarter Talk Group type and allow an Internal Command Talk group to be assigned in Select Talk Groups.

NOTE: The circle within a Command Talk Group with a number inside indicates there are two (2) Commander Stations assigned to the Command Talk Group. The outer circle represents that the Headquarter Talk Group is enabled.

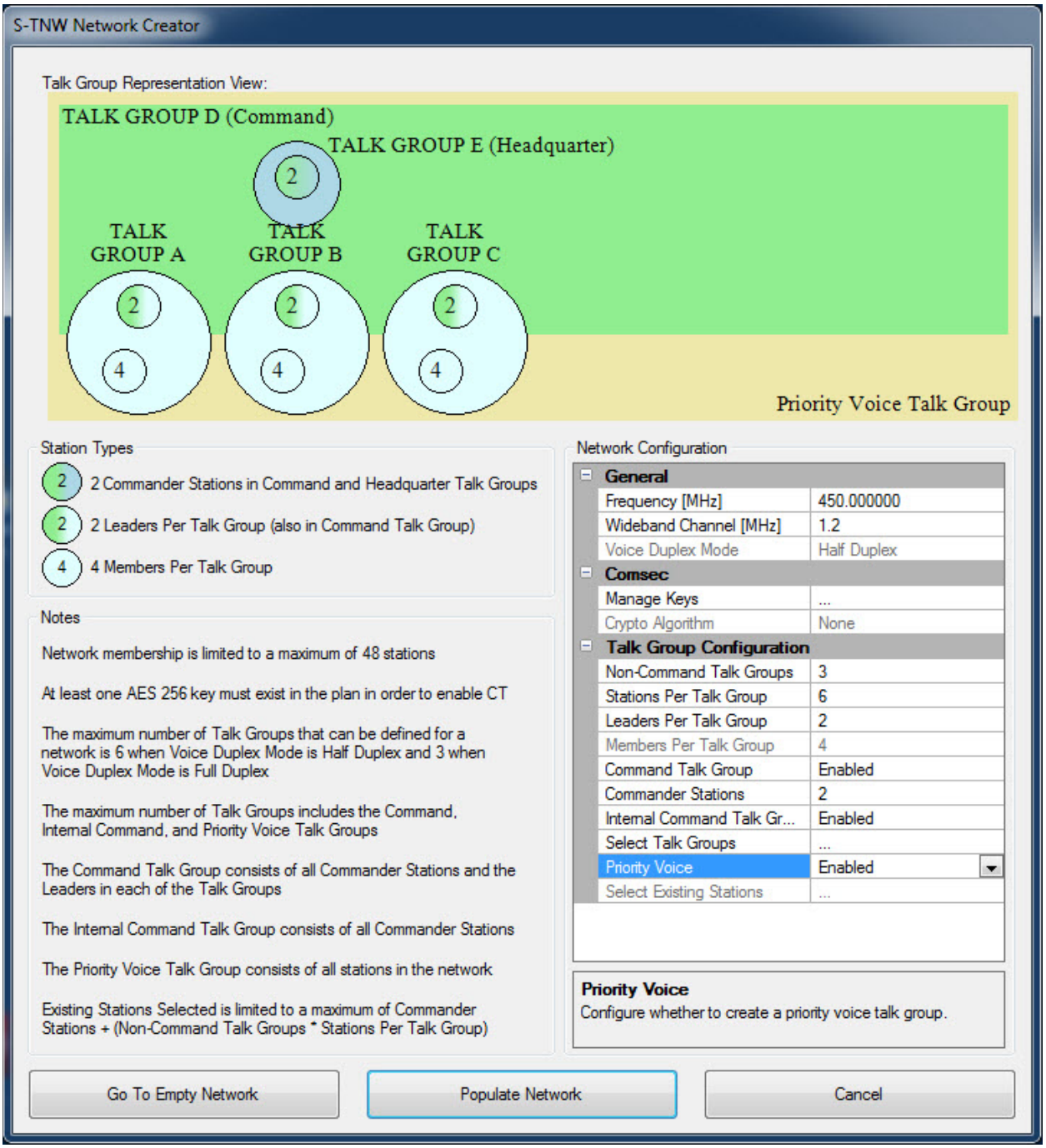


NOTE: The circles within the Talk Groups with a number inside indicates the number of Stations/Radios in that talk group where two (2) are the leaders and three (3) are members as shown below.

8. Optionally, configure **Select Talk Groups** by selecting ... to create custom names and assignments. Default talk groups names and stations are created for you.
   a. Add Talk Groups using Configure Talk Groups to create talk groups (default names are Talk Groups A through E). Station names are assigned based on Talk Group Name and a number. Talk Group A member 1 would be AMBR1 for example.
   b. Analyze the example figures below to see how the groups are automatically assigned to the **Command Talk Group** and the **Internal Command Talk Group**.
   c. Edit group assignments using the dialog tools.
9. Set **Priority Voice** to the command talk group. This will consume one of the talk groups.
10. Select **Populate Network** to generate the network configuration.



NOTE - Default naming conventions and assignments are shown.


S-TNW Network Creator
Talk Group Representation View:
TALK GROUP D (Command)
TALK GROUP E (Headquarter)
TALK GROUP A
TALK GROUP B
TALK GROUP C
Priority Voice Talk Group
Station Types
2 Commander Stations in Command and Headquarter Talk Groups
2 Leaders Per Talk Group (also in Command Talk Group)
4 Members Per Talk Group
Notes
Network membership is limited to a maximum of 48 stations
At least one AES 256 key must exist in the plan in order to enable CT
The maximum number of Talk Groups that can be defined for a network is 6 when Voice Duplex Mode is Half Duplex and 3 when Voice Duplex Mode is Full Duplex
The maximum number of Talk Groups includes the Command, Internal Command, and Priority Voice Talk Groups
The Command Talk Group consists of all Commander Stations and the Leaders in each of the Talk Groups
The Internal Command Talk Group consists of all Commander Stations
The Priority Voice Talk Group consists of all stations in the network
Existing Stations Selected is limited to a maximum of Commander Stations + (Non-Command Talk Groups * Stations Per Talk Group)
Network Configuration
General
Frequency [MHz] 450.000000
Wideband Channel [MHz] 1.2
Voice Duplex Mode Half Duplex
Comsec
Manage Keys ...
Crypto Algorithm None
Talk Group Configuration
Non-Command Talk Groups 3
Stations Per Talk Group 6
Leaders Per Talk Group 2
Members Per Talk Group 4
Command Talk Group Enabled
Commander Stations 2
Internal Command Talk Gr... Enabled
Select Talk Groups ...
Priority Voice Enabled
Select Existing Stations ...
Priority Voice
Configure whether to create a priority voice talk group.
Go To Empty Network
Populate Network
Cancel

S-TNW

S-TNW General Information

The Soldier TDMA Networking Waveform (S-TNW) is a waveform designed for mobile or dismount operations where shorter communication ranges, higher node count, priority on voice, and Situational Awareness (SA) reports are required. S-TNW is a networked voice and IP data TDMA based on a mobile ad hoc mesh waveform. The network supports up to 48 stations, six dedicated talk groups, and multiple voice hop relaying. Receive only mode, man-down alert, and network ID capabilities are included in this waveform.

Application Options

Select **Tools > Applications Options...** to set default options for S-TNW.

Optimize Max Users - Select Enabled or Disabled. When set to Enabled, the Max Users property will be automatically configured to the lowest value greater than or equal to the number of stations in the network. When set to Disabled, the user can choose the Max Users setting.

Enable VOX Keysource - Select Enabled or Disabled. Set this to Enabled if you want to assign a talk group to the VOX Keysource.

Name Prefix - STNWNET is default 1-12 character alphanumeric. Networks are created as STNWNET1, STNWNET2, etc.

Show Network ID - Select whether to display and allow the configuration of the Network ID property.

Show Warning Dialog - Select Yes to see warnings when modifying the network.

Wireless IP

Increment WIP Subnet - Enabled automatically increments IP Address on new WIP enabled networks.

Validate Radio IDs - Enabled validates whether stations have different radio IDs in different WIP enabled networks.

Network Information

Refer to Network Information for Name, Description, and Notes properties.

Preset Properties

The network preset type is S-TNW and cannot be edited. Expand Preset to view network properties.

General

COMSEC

Wideband Keys

Data/Voice (Traffic)

Advanced

Configure Profiles

Assign Stations To Profiles

Global S-TNW Properties

Wideband Keys Manager

Configure Talk Groups

General S-TNW

The General category sets the basic net frequencies and radio power level.

Frequency [MHz]

Configure the frequency for the network from 225 to 2000 MHz (must be a multiple of 0.005 MHz).

Receive Only

For radio frequency emission control and silent radio operations with transmit capability inhibited, Receive Only should be set to **Enabled**. Keep this feature disabled for full transmit and receive capability.

TX Power

Select the appropriate transmit power level (**High**, **Medium**, or **Low**) from the drop-down list.

Bandwidth [MHz]

Set the bandwidth to **1.2** or **5.0** MHz.

Channel Access

This feature enables data and voice transmissions on the same net and is set to **S-TNW**.

Voice Playback Latency

Select **One Epoch, Two Epochs,** or **Auto.** Set the maximum number of epochs used for voice forwarding.

The S-TNW network allows an unlimited number of voice relay hops. Voice is relayed three (3) times per TDMA epoch, where a TDMA epoch period can reach approximately 300 ms. As radios are moving away from each other and a radio transmitting audio, the receiving radios may be forced to inject silence each time they pass by the third hop within an epoch. This is necessary to reduce the effects of jitter when moving away from any transmitter.

The ONE EPOCH setting will force 300 ms of audio silence at the start of a received audio session. TWO EPOCHS has 600 ms of audio silence and AUTO has no silence injected. Using an epoch setting to add silence does incur the penalty of up to 600 ms of playback latency. AUTO makes the audio prone to jitter and keeps latency to a minimum.

The AUTO mode is best suited for groups of soldiers not likely to spread their ranks across vast distances. The ONE or TWO EPOCHS settings are best suited for long haul repeater scenarios and convoys.

Voice Duplex Mode

Select **Half Duplex** or **Full Duplex**.

Digital Voice has two modes of operations: Half-Duplex and Full-Duplex. Half-Duplex operations behave similar to any other half-duplex digital voice over VHF/UHF Line Of Sight (VULOS) waveform with the following additional features.

- Data operations can occur simultaneously
- Voice channels allow for a controlled break-in

Full-Duplex operations behave as if every soldier had two VULOS radios wherein each soldier randomly picks which radio to transmit their communications. Again, during Full-Duplex operations, IP data and SA reports occur simultaneously and voice channels allow for a controlled break-in.

Number of Data Slots

Enter the number of shared data slots (4, 8, or 12) in the current network. IP data is transmitted in the data frames. Data operations are dissimilar to other Ad-Hoc IP Networking waveforms in that the data slots are shared and no Layer 3 Routing protocol is used to determine IP packet forwarding, hence S-TNW is an Ad-Hoc Mesh rather than a Mobile Ad-Hoc Network (MANET).

Data Rate ID

The minimum physical ID used for IP data rate. Data rate ID's represent increasing throughput rates. A higher rate is intended for video for example. For a 1.2 MHz bandwidth, select from **Data Rate ID 2** through **Data Rate ID 6**. For a 5.0 MHz bandwidth, select from **Data Rate ID 2** through **Data Rate ID 10**.

Refer to the following table for data rates. All Measurements are in kbits/sec and reflect 500 Byte Unicast Packets. This is the maximum throughput that a user should expect for a single point-to-point and/or point-to-multipoint transfer.

MAX Users	Talk Groups	Data Slots	Data Rate ID 2	Data Rate ID 4	Data Rate ID 6	Data Rate ID 8	Data Rate ID 10
4	1	4	64.6	220.7	442.2	893.1	1905.5
		12	20.4	70.3	141.4	290.9	620.6
	3	4	56.4	193.9	388.4	782.3	1671.4
		12	17.7	61.1	122.8	253.2	541.2
	6	4	44.1	151.9	304.5	614.5	1311.7
		12	13.6	47.0	94.8	197.4	421.8
6	1	4	62.5	215.0	430.5	867.3	1850.0
		12	19.7	68.0	136.7	282.4	603.6
	3	4	54.6	186.9	374.5	757.8	1616.8
		12	17.0	58.7	118.2	245.1	523.7
	6	4	42.3	145.5	290.9	589.1	1256.7
		12	12.8	44.7	90.2	189.2	404.5
8	1	4	60.8	209.1	418.8	843.6	1798.4
		12	19.0	66.9	134.5	273.1	583.4
	3	4	52.8	181.1	363.6	732.1	1562.3
		12	16.4	58.2	116.4	236.9	506.2
	6	4	40.2	139.1	278.8	563.2	1202.1
		12	12.3	43.6	87.8	181.1	387.1
12	1	4	58.3	200.2	401.0	806.8	1721.0
		12	18.3	63.4	127.5	262.2	560.0
	3	4	50.5	173.4	347.5	700.0	1493.4
		12	15.8	54.8	110.5	226.8	484.7
	6	4	38.3	131.8	264.2	535.6	1142.9
		12	11.7	41.0	82.7	172.4	368.5
16	1	4	55.0	188.4	377.4	760.8	1623.3
		12	17.1	60.2	121.1	247.1	528.0
	3	4	47.0	161.7	324.0	654.0	1395.8
		12	14.5	50.7	101.9	210.7	450.5
	6	4	35.0	120.0	240.6	489.5	1044.9
		12	10.7	36.7	74.1	156.4	334.3

24	**1**	**4**	49.9	171.0	342.6	691.4	1475.6
		12	15.7	54.6	109.8	224.1	479.0
	3	**4**	42.3	145.3	291.3	586.9	1252.5
		12	13.0	45.7	92.3	189.7	405.2
	6	**4**	30.4	104.9	210.3	426.2	910.0
		12	9.2	32.0	64.4	135.4	289.7
32	**1**	**4**	43.6	150.3	301.1	606.7	1294.6
		12	13.4	47.7	96.0	195.6	418.5
	3	**4**	36.0	123.6	247.8	501.2	1069.9
		12	11.1	38.8	78.2	161.1	344.6
	6	**4**	24.6	83.2	167.0	340.5	727.1
		12	7.0	25.0	50.6	106.9	228.6
48	**1**	**4**	34.3	116.6	233.8	472.7	1008.9
		12	10.3	36.0	72.7	151.4	323.8
	3	**4**	26.2	90.1	180.6	368.3	786.3
		12	7.9	27.8	56.2	116.6	249.5
	6	**4**	14.5	50.7	102.0	208.1	444.8
		12	3.9	14.0	28.7	63.5	136.2

Comsec S-TNW

The Communications Security (COMSEC) category sets the encryption type for the net.

Keys must be generated and in the plan before any Crypto selection will be active. Refer to Manage Keys for instructions.

Crypto Algorithm

Selections for RF-7850S radios are: **None** and **AES 256**, based on the availability of keys.

Select **None** for PT crypto type operation. For example, an external encryption device is being used.

CT is available when the Crypto Algorithm property value is associated with a key.

Key Name

Shown when the Crypto Algorithm property value is not None. This property is restricted to names of existing keys of the type specified by the Crypto Algorithm property. For example, if only the default AES1 is configured, then this value is set to AES1. For multiple keys, use the drop-down list to select the Key Name (i.e., AES1, AES2, AES3). Use **Tools > Key Management** to configure keys.

S-TNW Wideband Keys

Use the Wideband Keys Manager to define Wideband TRANSEC Keys.

Wideband Keys Algorithm - The Wideband Keys Algorithm for S-TNW networks is AES 256.

Wideband Key Name - If more than one key is configured, select a TSK Wideband Key from the list of configured Wideband Keys for this network.

Data/Voice (Traffic) S-TNW

The Data/Voice category sets the modulation parameters for the net.

Allow Voice

This setting controls whether voice communications are permitted within the network. Select **Enabled** to permit voice communications or **Disabled** if only data communications are being used.

Info Type

The type of traffic supported by this network is set as follows.

Info Type is restricted to **Data** when Allow Voice is set to Disabled.

Info Type is restricted to **Voice** when Allow Voice is set to Enabled, Allow Wireless IP is set to Disabled, and Allow Reporting is set to Disabled.

Voice Mode

MELP is the default. Digital Voice is transmitted Over The Air (OTA) as MELP 2400 bps compressed audio, which may be encrypted using the AES. This is not applicable when Allow Voice is Disabled.

Max Users

Sets the maximum number of radios that may be configured for this network. Intervals are 4, 8, 12, 16, 24, 32, and 48. If the number of desired radios is not equal to one of the available intervals, use the next higher interval number.

The Max Users property is automatically configured when the S-TNW2 > Optimize Max Users Application Option is Enabled. Set the S-TNW2 > Optimize Max Users Application to disabled to configure manually.

Advanced S-TNW

The Advanced category is used to set up per-station transmit power override on all radio types, and to enable special features.

Allow Wireless IP - **Enabled** permits IP Configuration functions within the network. **Disabled** removes over-the-air network IP capability.

IP Configuration - Expand the IP Configuration group to view properties.

IP Forwarding - Select **No Forwarding** or **RNDIS Peer**.

Telephony - Enable or **Disable** Telephony functions for the network.

TX Power Override - permits configuration of individual TX Power settings for stations.

Default Radio Screen - Select which display screen will be shown first when a radio preset is selected.

GPS - Expand the GPS group to view properties.

Retransmit - Select ... to the right of **Retransmit**.

VoIP - Select ... to the right of **VoIP** to make channel assignments.

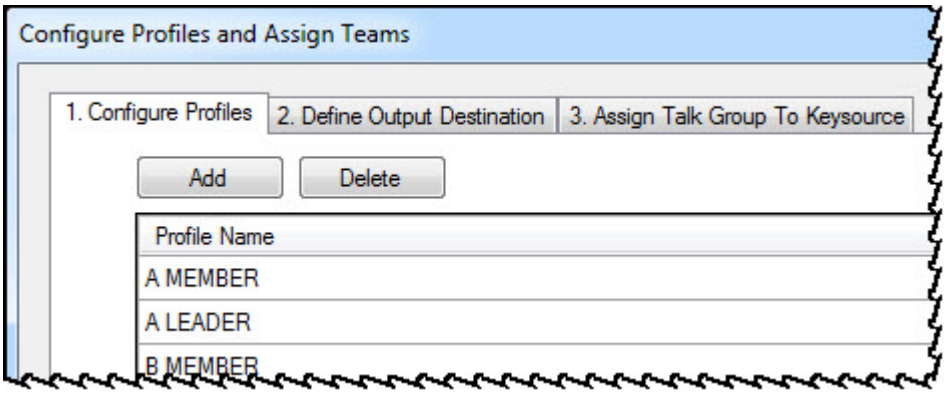
S-TNW Configure Profiles and Assign Teams

Each of the tabs in this section are filled out as needed. Select OK when all tabs are complete.

Configure Profiles

Stations are associated with profiles after profile communication settings are configured. A profile can use any number of talk groups currently in the network.

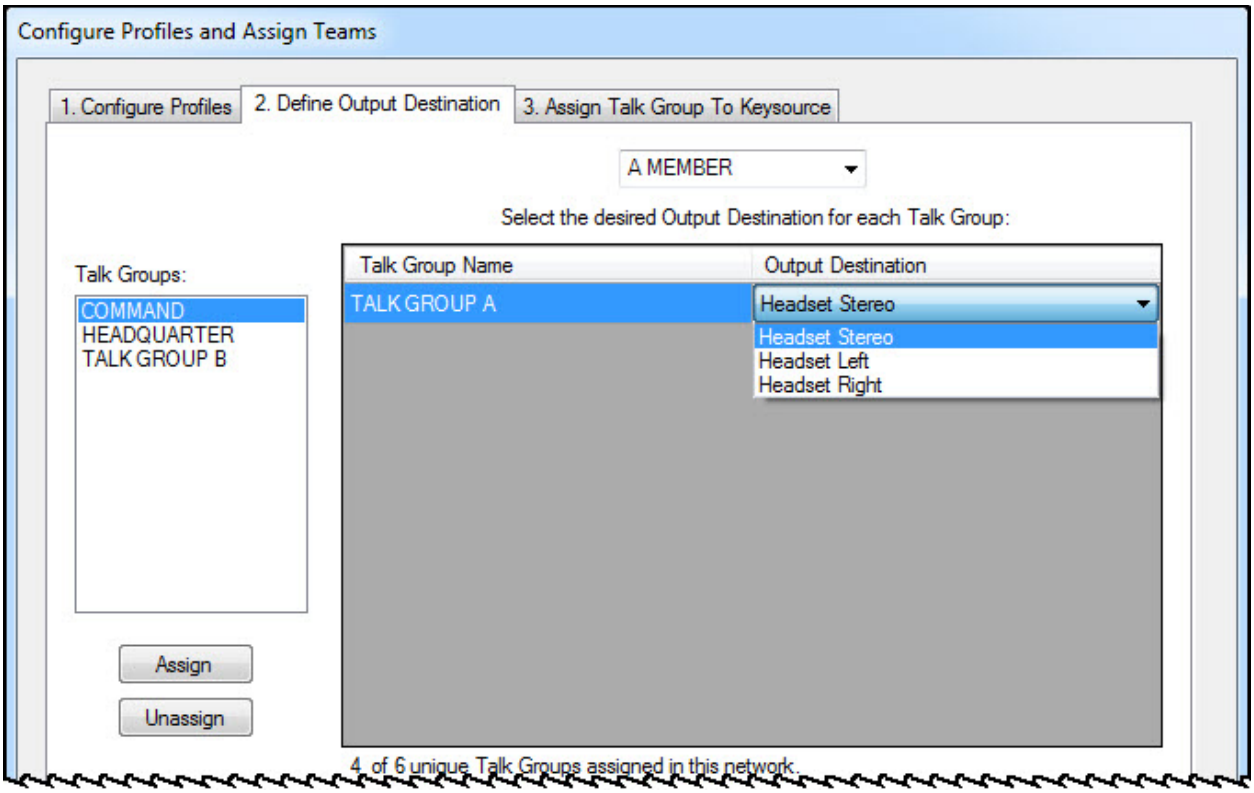
1. Configure profiles for this network by using Add and Delete to define multiple profiles.
2. Change a profile name by selecting the name and entering a new name.



Define Output Destination

Each member of a talk group needs a defined headset output destination. Assign or unassign talk group members as required.

1. Select a profile from the pull down on top to define output destinations.
2. Select a Talk Group from the box on the left.
3. Select Assign to associate it with the selected profile.
4. Select the Output Destination (Headset Stereo, Headset Left, Headset Right) for communications for that talk group.

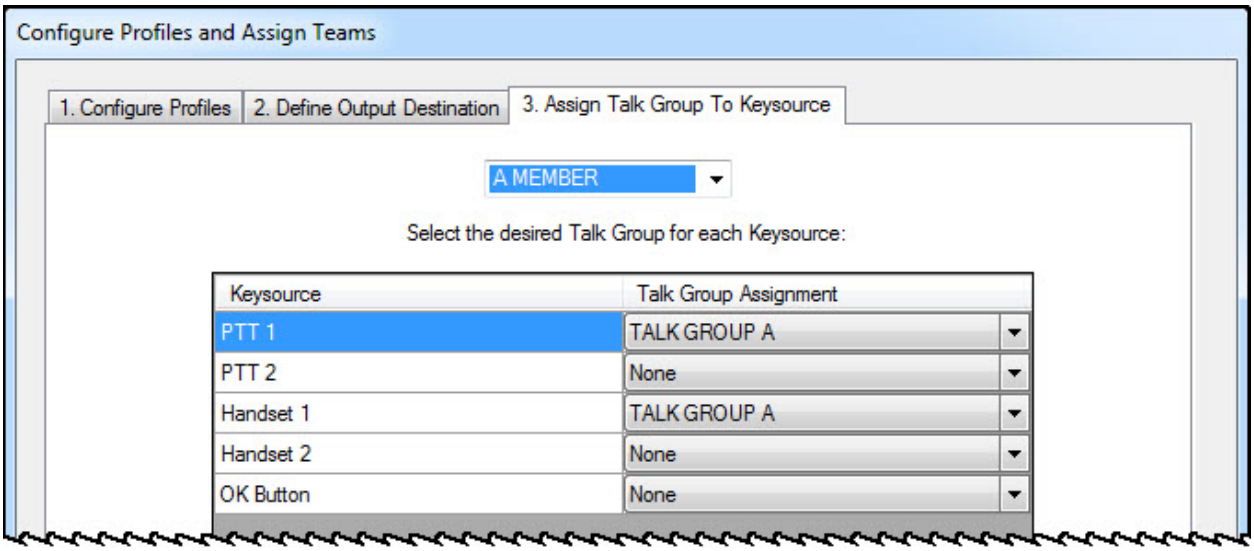


Assign Talk Group To Keysource

A Talk Group must be configured to a profile prior to it being allowed to be selected as a Key Assignment.

> **NOTE**: The VOX keysource is disabled by default in the Tools > Application Options > S-TNW General settings.

1. Select the desired Talk Group for each Keysource.
2. Select OK when done.

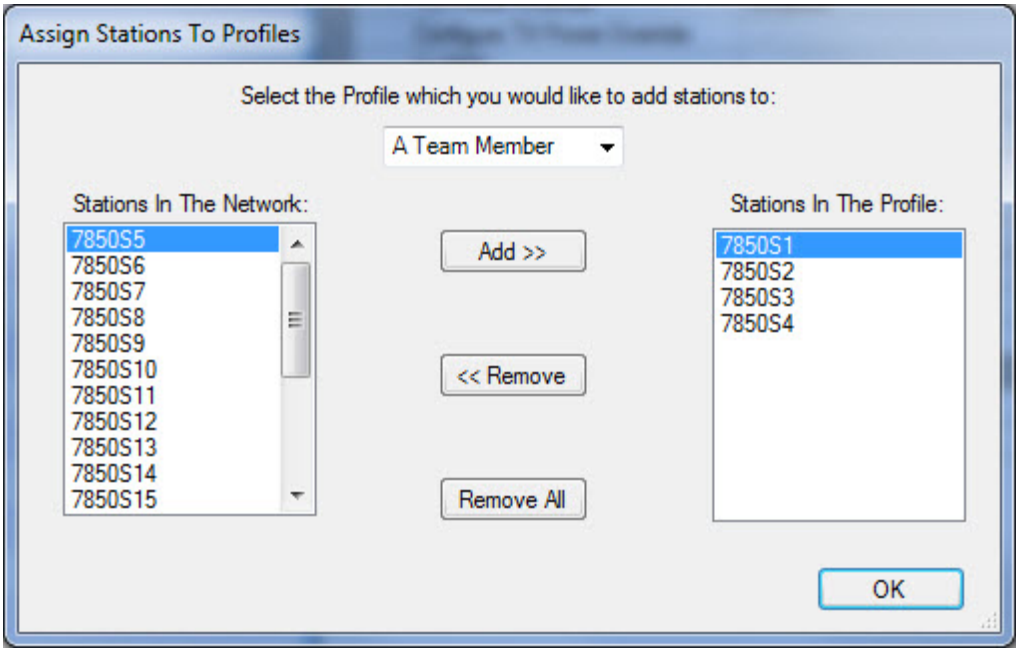


S-TNW Assign Stations To Profiles

Assign stations to talk group profiles in this network. Select **Add >>** and use Ctrl or Shift key to add multiple. Select **<< Remove** to remove items. A station can only be assigned to one profile per network.

> **NOTE:** The first number of stations added to the talk group are assigned as leaders based on the number of leaders requested per talk group.

1. Select the profile from the drop-down menu.
2. Select a station or stations.
3. Select **Add >>** to place stations in the profile or **<< Remove** to remove stations from the profile.
4. Select **OK** when you are finished adding or removing stations.



Global S-TNW Properties

Wideband Keys Manager

The TRANSEC Manager includes the ability to Add, Delete, and Regenerate wideband Transmission Security Keys (TSKs). Up to 25 TSKs can be defined per plan.

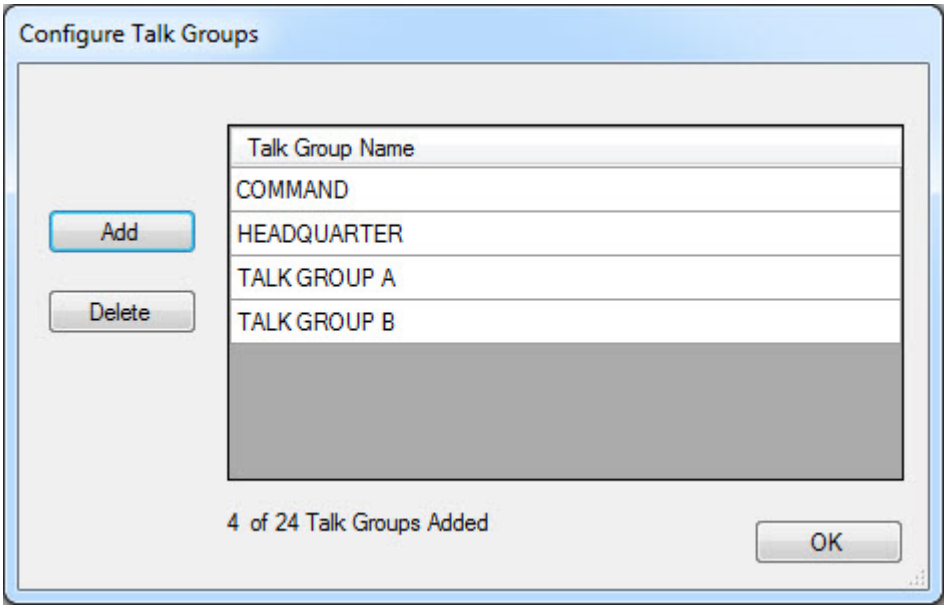
To configure keys:

1. Select a network and expand the **Global S-TNW** parameters.
2. Select ... to the right of **Wideband Keys Manager**.
3. Observe that TSK01 is automatically assigned.
4. Select **Add** to generate a TRANSEC Key value and a Key Name.
5. Remove a key by selecting the key and selecting **Delete**.
6. Select **Regenerate All** to generate all new keys.
7. Select **OK** to finish.

Configure Talk Groups

Select **Add** or **Delete** to configure talk groups for this network. Up to 24 talk groups may be defined. The number of talk groups that a station can be in is limited only by the number of talk groups in use for the network. A network can use up to 3/6 unique talk groups, depending on whether the Voice Duplex Mode for the network is set to Half Duplex or Full Duplex.

Change a talk groups name by selecting the name and entering a new name.



Advanced Properties

IP Configuration

Using the CPA-assigned default settings is recommended. IP Configuration is available when Allow Wireless IP is enabled in network with IP capabilities.

> **NOTE -** IP Configuration is not available if more than 254 stations are in the network.

Subnet

Configure the first 3 octets of the Subnet to a valid IP Address. The default Subnet property is an automatically generated value that is unique within the plan beginning with 192.168.100.X when the Increment WIP Subnet property under Application Options is set to Enabled. It increments from the last assigned subnet address to the next unused subnet address. When there are no more unique subnet addresses from the last entered to and including 192.168.252.X, the lowest unique address in the 192.168.0.X - 192.168.252.X range is used. Once all unique addresses in the 192.168.X.X range are exhausted, the first unique address in the 192.169.X.X. range is used.

Subnet Mask

This read-only field displays the subnet mask for the radios within this network. The Subnet Mask is set to 255.255.255.0 for FF nets.

Gateway

If the net uses an RF-6010 Tactical Network Hub, select the station name that is directly connected to the RF-6010 from the pull down list. This station will act as the Wireless IP gateway. Otherwise, leave the Default Gateway as None.

Radio ID(s)

Radio IDs consist of a Radio ID setting from each radio in this network. Radio IDs must be in the range of 1 to 254 (or 1022 for CWR nets) and must be unique within any single net. A unique ID is automatically assigned.

Wireless IP Address

Identifies the wireless IP address for the stations in the network.

This property is available if the net is to be used for wireless IP data communications, Directed Calling, or per radio-type baud rate override. When available, the IP Configuration of member stations is shown.

TX Power Override

Tx Power Override

Select **Enabled** to permit the configuration of individual TX Power settings for stations within the plan (enables the **Configure Tx Power Override** feature).

Configure Tx Power Override

Setting the Power Level to Network (default) automatically sets the Power Level to the network setting. The current network power setting is displayed in the top portion of the Advanced TX Power Settings window. The **Stations** column lists each radio in the currently selected net.

1. Select ... to access the **Advanced TX Power Settings** dialog and override the default station transmit power setting for the network.
2. Select a Power Level of **Network**, **High**, **Medium**, or **Low** (and High+ in some cases) for each station.
3. Select **OK** when done.

GPS Reporting

The radio contains an internal GPS for position display information, Situational Awareness (SA) reporting, or obtaining distance and bearing to other units.

The GPS feature provides the capability to transmit Position Reporting data if operationally required. Position Reporting typically uses a designated Position Server for the entire network.

The CPA can be configured to send position reports to a designated Position Server and also to receive Position Server reports from other stations and forward this information to a designated Position Server.

Allow Reporting

When set to Enabled, the sending of GPS Position Reports can be done from the radio. The setting of Disabled removes GPS Position Reporting capability. Enable or disable the GPS Position Reporting application when this network is active. This property allows configuration of both the over-the-air GPS reporting and the SA IP Packet generation systems for independent operation.

Auto Report

This menu, available only for COMSEC nets, allows the selection of the type of GPS reports to send.

> **NOTE** - Preset must be configured to use COMSEC for the **Auto Report** property to be available.

Reports can be configured to be sent on each PTT. Set as required from the choices below:

Never - GPS Position Reports will not be sent.

PTT - The most recent GPS Position Report is sent when the radio operator presses the PTT button on the radio.

Timed - Not available on FF nets. GPS Position Reports will be sent at the Report Interval setting of each individual radio.

Position Difference - Not available on FF nets. GPS Position Reports will be sent at the Position Difference Interval setting of each individual radio.

Timed and Position - Not available on FF nets. GPS Position Reports are sent at the Report Interval setting of each individual radio, or GPS Position Reports are sent at the Position Difference Interval setting.

Report Interval, and **Position Difference** depend on the appropriate Auto Report value selected.

Report Interval [s] applies to “Timed” auto reporting. Values can be 1 to 9999 seconds (default is 60 seconds).

Position Difference [m] applies to “Distance” auto reporting. Values can be 1 to 99,999 meters (default is 100 meters). GPS position is sent when the distance between the current position and the last transmitted position exceeds this distance.

GPS Override

Select  to the right of **GPS Override**. In the **GPS Override** dialog, the **GPS** properties box provides the capability to override the network GPS values on a station by station basis, as required. Choices from the drop-down list are **Use Network Settings** or **Override Network Settings**.

Position Servers

A Position Server collects received GPS Situational Awareness (SA) reports and forwards them as IP packets for collection by other software to track, display, map, etc. The Position Server configuration settings specify whether report forwarding is on or off, the IP address to which reports are forwarded, and at what interval reports are forwarded. Custom IP format settings are Harris SA, Keyhole Markup Language (KML), and NATO Friendly Force Information (NFFI).

Select  to the right of **Position Servers**. In the **Position Server Configuration** dialog, the **Position Server Properties** box provides the capability of forwarding position reports as operationally required. Choices are **Off**, **Custom IP**, or **Web File**.

Off - When selected, the radio will not forward position reports.

Custom IP - Type the required custom IP address. This field would typically be the IP address of the PC or Laptop running the Network's Position Server software.

Position Server IP - The IP address of the Position Server.

Position Server Port - The port number on the server to access.

IP Report Interval [s] - The interval (in seconds) between forwarding each report.

IP Format - The format of the reports that will be sent to the server are **Harris SA**, **KML**, and **NFFI**.

When IP Format **NFFI** is selected, the following properties become active:

Source Country - Select from the drop-down list (ALL COUNTRIES, NATO, AFGHANISTAN . . . ZIMBABWE).

Source System - Enter a value between 0 - 255 to specify the numeric representation of the Force Tracking System(s) sending/receiving tracking data (where 0 represents any system and 255 represents all systems).

Source Subsystem - Enter a value between 0 - 255 to specify the numeric representation of the Force Tracking System(s) sending/receiving tracking data (where 0 represents any subsystem and 255 represents all subsystems).

Destination Country - Select from the drop-down list (ALL COUNTRIES, NATO, AFGHANISTAN . . . ZIMBABWE).

Destination System - Enter a value between 0 - 255 to specify the numeric representation of the Force Tracking System(s) sending/receiving tracking data (where 0 represents any system and 255 represents all systems).

Destination Subsystem - Enter a value between 0 - 255 to specify the numeric representation of the Force Tracking System(s) sending/receiving tracking data (where 0 represents any subsystem and 255 represents all subsystems).

Data Priority - Select from Routine, Priority, Immediate, or Flash data priority.

Web File - The associated Position Server IP Web file.

IP Report Interval [s] - Enter a value in seconds (the default is 30).

IP Format - KML is auto-selected.

Retransmit (or Outstation Retransmit)

The **Retransmit Configuration** dialog permits the user to configure the retransmit settings for the radios on the network.

Two radios are required at the retransmission site location with both radios having the retransmit capability enabled. The retransmit-enabled radio receives voice or data from a source radio and forwards the information to a second radio for on-going transmission.

When Retransmit is enabled in the Retransmit Configuration dialog, the following properties become active:

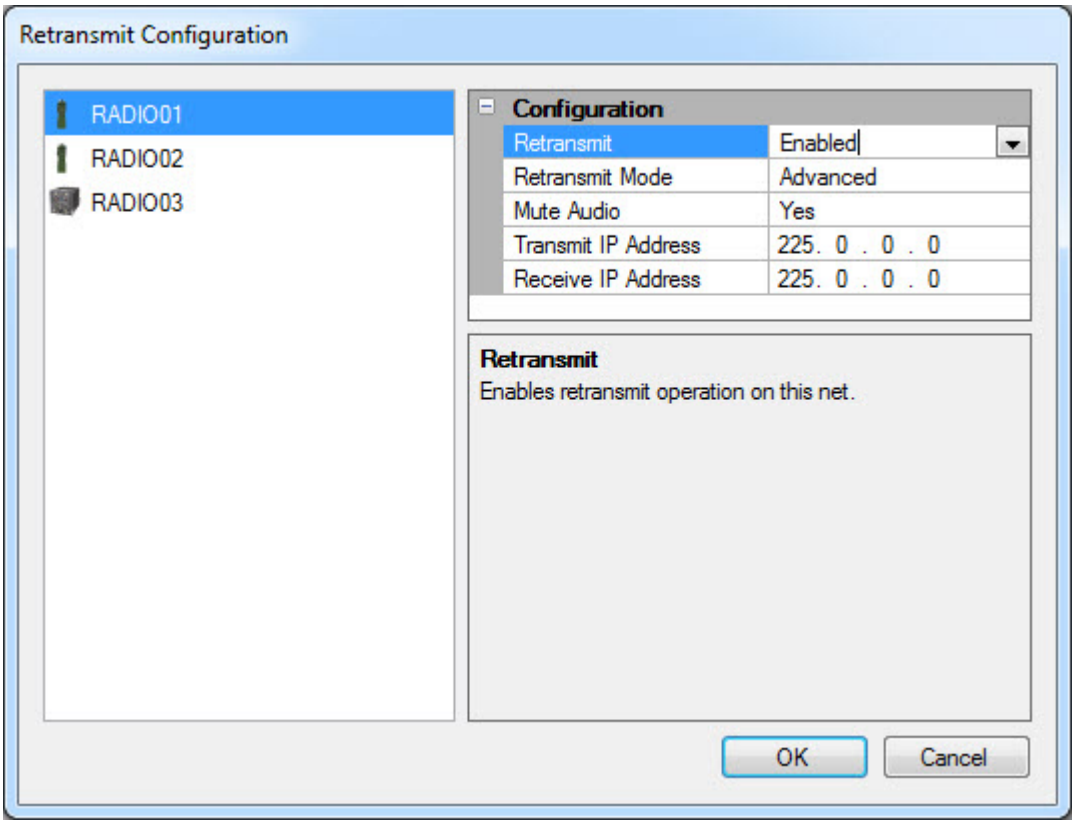
Retransmit Mode - Select **Simple** or **Advanced**.

- **Simple** - Provides red/black retransmit capabilities on networks with all retransmit radios configured the same way. Simple is only available when Channel Access is set to None. Simple allows you to enable a Black Repeater.
- **Advanced** - Red retransmit audio and data. It can be used on all net types and on networks with differently configured radios.

Mute Audio - Select **Enabled** to mute the audio to the speaker/headset/auxiliary port when using red retransmit.

Transmit IP Address - Enter the destination IP address for single radio retransmit or an IP multicast address for multi-radio retransmit. The IP address range is 224.0.0.0 - 239.255.255.255; however, IP addresses 224.0.0.0 - 224.0.0.255 are reserved for other protocols.

Receive IP Address - Enter the IP multicast address on which to receive audio for multi-radio retransmit. The IP address range is 224.0.0.0 - 239.255.255.255; however, IP addresses 224.0.0.0 - 224.0.0.255 are reserved for other protocols. Use an IP address of 0.0.0.0 for single radio retransmit.



VoIP Channel Assignment

Select the VoIP ... to open the VoIP Configuration dialog.

The VoIP Configuration dialog permits the user to configure a Primary Channel for each station. The Primary Channel is the VoIP channel on which to transmit audio that was received over the primary net. Refer to VoIP (Channel Configuration) for information about creating channels.

Select the Primary Channel from the Channel Assignment drop-down for each station in the **VoIP Configuration** dialog.

Sample Plans

Sample communication plan files are included with the CPA installation. They can be used as a reference, or they can be opened and edited directly to create a new plan. All parameters of the sample plans may be edited to suit the specific operation. Harris suggests making a copy of the sample plan and renaming it so that the original is not changed.

Look for sample plans in the CPA folder installation location **...\Harris RF Communications\Sample Plans**.

> **NOTE** - If multiple CPA Products have been installed, then additional Sample Plans will be present in this same folder location.

7850S_Sample_LOS-FF_net.hcpa

This plan includes one FF/LOS network with 12 radios operating at 455.000000 MHz. Bandwidth is 25 kHz with Channel Access set to None. One AES 256 key is included in the plan. Voice mode is CVSD.

7850S_Sample_3x_Team_net.hcpa

This plan includes one S-TNW network with three talk groups, one command unit, and 17 radios operating at 450.000000 MHz. Bandwidth is 1.2 MHz. Reporting is enabled on time and position.

7850S_Sample_TNW_net.hcpa

This plan includes one TNW network (Net Switch 1) with 24 radios. The TNW net is set to use AES 256. The default hopset 782 wideband (400-410) is used. Reporting is enabled on time and position.

7850S_Sample_Video_net.hcpa

This plan includes one S-TNW network with four radios (Scout1, Scout2, VideoRX, VideoTX) operating at 450.000000 MHz. Bandwidth is 1.2 MHz. Each radio has a RNDIS IP address and a Wireless IP address.

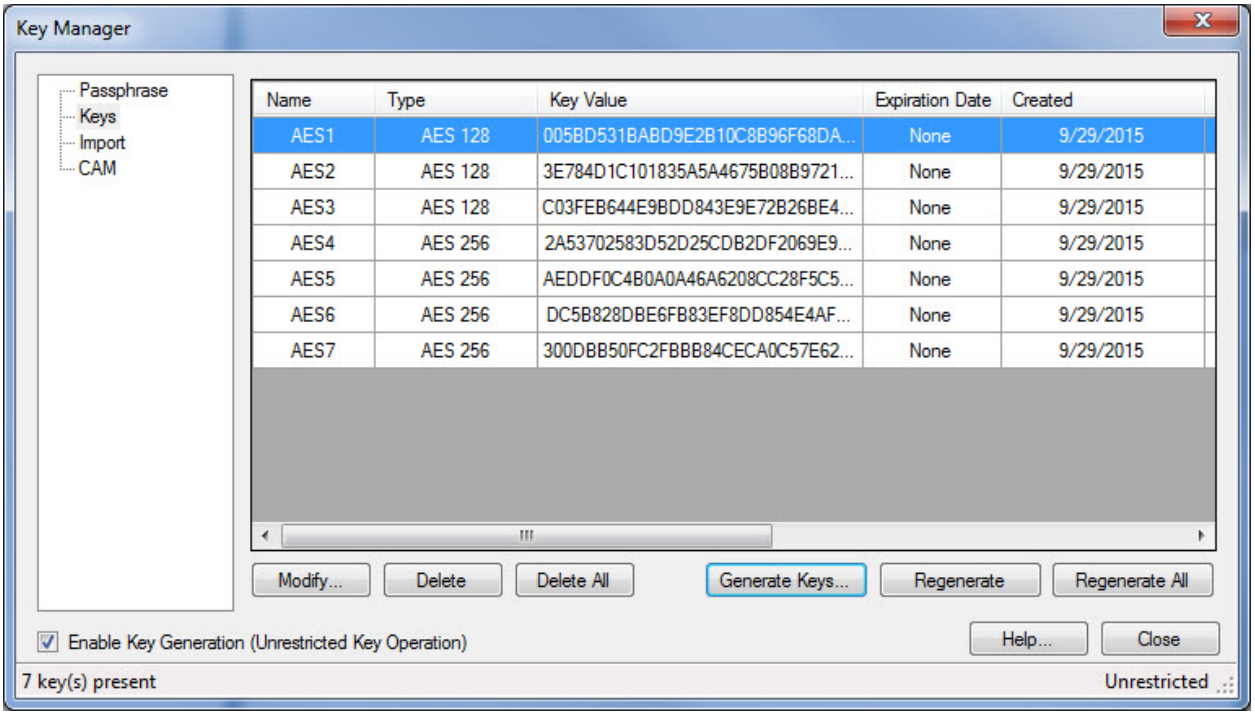
Manage Keys

Generate Keys

The CPA is capable of generating several different types of encryption keys. Keys must be generated and in the plan before the Crypto Algorithm selection will be active under the Communications Security (COMSEC) category. Preset must also be configured to use COMSEC for the Auto Report property to be available.

> **NOTE -** The Key Generation feature is an optional component of CPA. This feature may not have been installed.

The **Manage Keys** feature (if installed) is accessed by selecting the  toolbar icon, or by selecting **Tools > Key Management** from the application menu. The Key Manager screen is displayed as shown below.



This feature allows the following actions:

- Passphrase - Change Key Generation Password and Passphrase Recovery (Question and Answer).

  NOTE - The Passphrase option applies to unrestricted key generation and is only available to an Administrator user.

- Keys - View/Modify/Delete
- Import - Keys, CAM
- CAM - Create /Delete Citadel Algorithm Modification
- Enable Unrestricted Key Operation
- Generate/Regenerate Keys

NOTE - Key Rings is also an available Key Manager option used only for HF radios supported in CPA.

Import Keys

Keys generated by the following applications can be imported into CPA.

- Key Distribution Files (*.kdf)
- VHF-UHF/LOS RPA Plan Files (*.vpd)
- HF RPA Plan Files (*.rpd)
- Delimited Key Files (*.csv)
- CPA Files (*.hcpa)

Key Assignment

After keys are created or imported, key assignment in a network is done using the Properties menu area. CPA supports the following types of keys:

- **Unrestricted Keys** (generated by CPA)
- **Protected Keys** (imported comma-delimited files with the protected keys defined or read/imported from .hcpa files)
- **Restricted Keys** (generated by Harris KGA and imported into CPA)

The CPA can import restricted keys generated by the Key Generation Application or it can use unrestricted keys generated by the CPA.

NOTE - Unrestricted keys and restricted keys cannot be used in a plan at the same time.

Key Management

For detailed information on Key Management, refer to the CPA main Help by selecting **Help > Help Topics**.

Expand the menus by selecting **CPA Platform > CPA Platform Help and Support > CPA Platform Help > Constructing a Plan > Working with Keys**.

Program Radio

Open the **Program Radios** dialog using one of these methods:

1. Select the radio(s) to be programmed from the Network View or Topology View area or from the Explorer tab.
2. Select **Actions > Program Radio** or **Program** from the context menu.

Station Included in output file:

Confirm that the stations to be included in the output file are displayed in the left-hand side of the dialog.

Select the **Sort Descending** or **Sort Ascending** button (toggles) to sort the list of stations.

Programming Parameters:

Use Programming Parameters to set the mission plan file name and destination.

- **File Name** - Type the desired file name, which must be alphanumeric and can be up to 32 characters in length.

Select either the **Radio/File System** or **Ethernet** radio buttons as required.

- **Radio/File System** - If a radio is connected as storage device, this menu can be used to transfer the output file to the selected radio by using the **Transfer Location** drop-down box. The output file can also be sent to the designated file location by using the Browse feature. Up to 1024 default browse locations are saved.
- **Ethernet** - If a radio is connected as a RNDIS device, the output file can be sent to a designated IP Address by entering the required address.

  NOTE - Refer to the radio's operation manual for instructions on configuring the Ethernet interface. Use <**ipconfig**> from the PC command line to view the IP address.

Programming Options:

Use Programming Options to set the following properties. Select at least one option. The Options folder cannot be modified.

- **Program Radio Plan** - The plan configuration data will be loaded into the radio during programming.
- **Program Keys** -The traffic encryption keys will be loaded into the radio during programming. This field is only available if all the keys used by the radio include key values and the radio net has a key assigned.
- **Program Training File** - The training file for use with text prediction in SMS (when SMS is enabled) will be loaded.
- **Program CAM** - CAM will be loaded into the radio during programming. This field is accessible only if a CAM is part of the CPA Plan.

Use Compatibility Options to set the following properties.

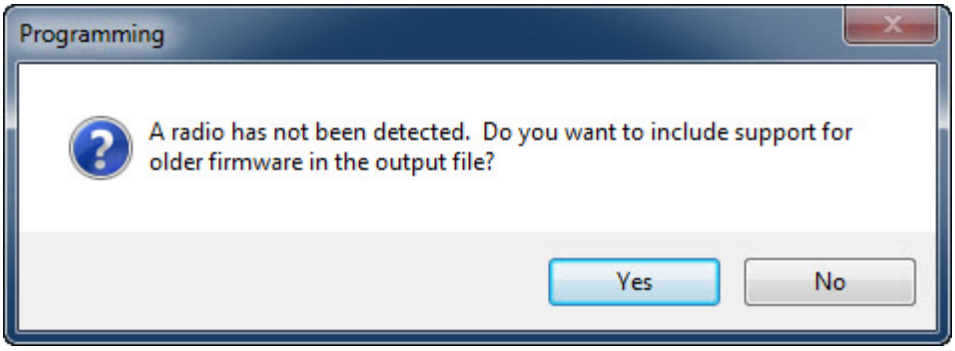
- **Show Firmware Messages** - when checked, show firmware message when system detects that the radio being programmed has different firmware installed and does not accept all features available in the current plan.
- **Create New Firmware Fill** - when checked, the fill file extension will be .cpaboot. Also, if the radio is reachable, programming will bypass querying the firmware version and just include the latest firmware version.

Start Programming:

When configuration settings are set as required, select **Start Programming**.

Older Firmware Support

When you create a fill file without a radio connected (save to the desktop), you will be shown the following message. This message determines what content will be added to the output file for all supported firmware versions.



> **NOTE** - Checking 'Yes" to the above prompt will increase the size of the output file which can result in a slower loading process. Legacy Firmware Support is only necessary when some of the radios being loaded do not contain the latest radio firmware version supported by CPA.

Complete Programming

Perform the following if you selected Radio/File System and the radio was connected as a storage device.

> **NOTE** - Do not turn off the radio before disconnecting the cable or the radio will not be programmed.

1. Confirm that programming was completed successfully in the Programming Status window in CPA.
2. Disconnect the USB cable connecting the radio to your PC while the radio is still on.
3. Verify the radio automatically loads the output file generated by CPA and completes the programming process once disconnected.

Support

Support Overview

We recognize that continued success in our business requires a strong commitment to customer support both before and after the sale. We offer this support not only through our sales and service facilities in nearly 120 countries around the world but also through our Technical Customer Service Department. This department can assist our customers in the specification, installation, operation, and maintenance of all of our products.

In addition, further help is available via direct communications with our main facility in Rochester, New York using any method shown below.

Mail

Harris Corporation
Communication Systems
1680 University Avenue
Rochester, NY 14610
USA

Telephone

866-264-8040 (toll-free)
585-242-3561

Fax

585-242-4483

E-mail

TAC@harris.com

Supported Operating Systems

The supported operating systems* are:

- Windows 10 (32/64 bit)
- Windows 8 / 8.1 (32/64 bit)
- Windows 7 (32/64 bit)
- Windows Vista (32/64 bit)
- Windows XP Pro (32 bit)
- Windows Server 2012 R2 (64 bit)
- Windows Server 2012 (64 bit)
- Windows Server 2008 R2 (64 bit)
- Windows Server 2008 (32/64 bit)
- Windows Server 2003 (32/64 bit)

* All Operating Systems tested using latest service packs.

> **NOTE** - CPA is compatible with foreign language Operating Systems when non-English localization is enabled.
>
> **NOTE** - The CPA installer will exit installation if the .NET 3.5 version of the Microsoft .NET Framework was not previously installed and the target operating system is Windows 8.0, Windows 8.1, or Windows Server 2012.

Compatibility

The following radio firmware versions are compatible with CPA for RF-7850S-TR 4.3.0:

- RF-7850S-TR radio firmware versions 4.2.7, 4.2.9, and 4.3.0

The following radios support heterogeneous FF-LOS (225.0 MHz – 512.0 MHz) or TNW (225.0 MHz – 511.975 MHz) nets with CPA for RF-7850S-TR:

- RF-7850M, RF-7850A, and RF-7850S combinations

The following radios support heterogeneous FF-LOS (350.0 MHz – 450.0 MHz) nets with CPA for RF-7850S-TR:

- RF-7800S-TR, RF-7800S-V, and RF-7850S combinations

What's New

CPA for RF-7850S-TR 4.3.0 includes the following new features.

- Added **Select Talk Groups** and **Priority Voice** configuration to S-TNW Network Creator wizard.
- Added **Forward Alerts** and **Alert IP** to Station Features > Messenger > Alerts.
- Added **RTP RX Latency**, **Timeout**, **Voice Latency**, and **Net Phone Number** to Station Features > VoIP. Voice Latency supports RF mode, BGAN, and manual mode.
- Added **Export Default Route** to Station Features > OSPF.
- Added **Metric** to Station Features > IP Routing. Metric (0 to 255) is used to decide routes priority where lower is better.
- Added **Multicast Mode** (Host or Bypass) to Station Features > IP Routing. Host programs the radio to act as an IGMP Host. Bypass programs the radio to bypass all IGMP traffic.
- Added **Limit Routes** to Station Features > IP Routing. Was a fixed limit of 10 in earlier versions.
- Added **VOX Sensitivity** to set the gain on the VOX voice filter.
- Added **IP Security** to Station Features.
- Added IP Routes to **Telephony**.
- Added **Configure RX Override** property support in a Fixed Frequency net General properties.
- Other general items: Windows 10 support, hC2 support, and Computer/RF-7800I-CU plug-in updates.

CPA for RF-7850S-TR 4.2.7 is the first release of the software.

CPA Platform v1.8 is provided during installation.

Glossary

-A-

Algorithm	A set of well-defined instructions for accomplishing a task that takes a given initial state to a defined end-state.
AES	Advanced Encryption Standard (also known as Rijndael) - a block cipher format adopted as an encryption standard by the U.S. government.
ASCII	American Standard Code for Information Interchange

-B-

bps	Bits Per Second
BW	Bandwidth

-C-

CAM	Citadel® Algorithm Modification
Citadel®	A Harris-proprietary encryption method that provides a high level of information security.
CODEC	Coder - Decoder
COMSEC	Communications Security
CPA	Communications Planning Application
CT	Cipher Text
CVSD	Continuously Variable Slope Delta

-D-

DD-MM-YY	Day-Month-Year
DES	Digital Encryption Standard

DHCP	Dynamic Host Configuration Protocol
DTG	Date-Time Group (example 051700Z May 2008)
DTMF	Dual-Tone-Multi-Frequency

-E-

ECCM	Electronic Counter-Counter Measures
Encryption Key	A numeric variable that changes the mathematical algorithm used to encrypt a digital signal.

-F-

FF	Fixed Frequency
Fixed Frequency	Fixed Frequency nets are used for basic LOS communications.
FM	Frequency Modulation
FM Deviation	For analog voice or frequency-shift keying, this is the maximum amount that the RF carrier frequency can be changed by the modulating signal.
FSK	Frequency Shift Keying

-G-

GPS	Global Positioning System

-H-

hcpa	The file extension used for CPA plans

-I-

ID	Identification

IP	Internet Protocol
ITAR	International Traffic In Arms Regulations

-J-

-K-

KDF	Key Distribution File
Key	An alphanumeric variable used to encrypt a digital signal; also called Traffic Encryption Key (TEK).
KGA	Key Generation Application
kHz	kilohertz
KML	Keyhole Markup Language is an XML framework for expressing geographic annotation and visualization.

-L-

LAN	Local Area Network
Link	Repeater
Lockset	A frequency range that a frequency hopping net may not enter. It is configured on the Locksets menu selection in CPA.
LOC	Location
LOS	Line-of-Sight; refers to VHF and UHF frequency bands.

-M-

Max	Maximum

MB	Megabyte - One million (1 x 10^6) Bytes
MD5	An authentication algorithm for SNMP.
MELP	Mixed Excitation Linear Processing
MGRS	Military Grid Reference System
MHz	Megahertz
MINERR	Minimum Error Propagation (Standard Citadel® Mode)
MM-DD-YY	Month/Day/Year - date setting
MP3	Moving Picture Experts Group Layer-3 Audio (audio file format/extension)

-N-

NATO	North Atlantic Treaty Organization
NDIS	Network Driver Interface Specification
NEI	Netherlands East Indies (GPS Position Format)
NFFI	NATO Friendly Force Information

-O-

-P-

PC	Personal Computer
PCMA	Pulse-Coded Modulation G.711 A-Law

PCMU	Pulse-Coded Modulation G.711 U-Law
PDA	Personal Digital Assistant
PDF	Portable Document Format
PEP	Peer Enclave Prefix
Position Reporting	A radio net feature where an Outstation radio can be programmed to automatically call a Base Station in the same net on a user-defined schedule. The Outstation provides geographic location information to the Base.
PT	Plain Text
PTT	Push-to-Talk

-Q-

-R-

RF	Radio Frequency
RNDIS	Remote Network Driver Interface Specification
RPA	Radio Programming Application
RTP	Real-Time Transport Protocol
RX	Receive

-S-

SA	Situational Awareness
SDP	Session Description Protocol

SHA	An authentication algorithm for SNMP.
Sidetone	The effect of sound that is picked up by the radio microphone and deliberately introduced (at low level) into the speaker or earpiece. Without sidetone, users do not hear their own voice in the speaker/earpiece and may think the radio is not working.
SIP	Session Initiation Protocol
SMS	Short Message Service
SNMP	Simple Network Management Protocol
SPI	Security Parameter Index for IP Security
Squelch	A circuit in a radio that quiets the receiver until the strength of a received signal exceeds a specified level.
SSL	Secure Socket Layer
S-TNW	An ECCM FSK waveform that provides digital voice and 16 kilobit data performance for anti-jam capability.
SVD	Simultaneous Voice and Data
Sync	Synchronous

-T-

Tac Chat	Tactical Chat
TDMA	Time Division Multiple Access
TRANSEC	Transmission Security
TSK	Transmission Security Key

TX	Transmit

-U-

UDP	User Datagram Protocol
UHF	Ultra High Frequency
UI	User Interface
U.S.	United States
USB	Universal Serial Bus
UTC	Universal Time Coordinated
UTM	Universal Transverse Mercator

-V-

VHF	Very High Frequency (30 MHz - 300 MHz)
*.vpd	The file extension used for legacy RPA plans
VoIP	Voice over IP
VOX	Voice Operated Transmitter

-W-

WGS 84	The World Geodetic System (WGS) is the reference coordinate system used by Global Positioning Systems. WGS 84 is the current revision of this coordinate referencing system.

-X-

YYYY-MM-DD	Year-Month-Day

-Y-

-Z-

ZULU	Another term for GMT-based time

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