CODAN
RADIO COMMUNICATIONS

RADIO COMMUNICATIONS

Envoy® Transceiver

Reference Manual

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Table of contents

Section 21 Encryption options

Section 26 Specifications

Appendix A Installation

Appendix B LED indications

Appendix C HF radio transmission

Appendix D Call types and features

Appendix G Licence information

Index

List of figures

List of tables

1 Introduction

This manual provides an overview of the Envoy transceiver, how to install it in mobile and fixed stations, how to operate the transceiver, and how to perform advanced setup procedures. This manual is for system administrators who set up and maintain HF communication networks.

If there is relevant information provided elsewhere in the manual, a link to this information is available in the Related links at the end of the section. All acronyms and descriptions of terms are included in *Definitions* on page 601. There is an index at the end of this manual as an aid to finding specific information.

This manual contains the following sections:

Introduction—provides an overview of this manual, and the components that make up the transceiver system

Using the wizard—describes the steps required to set up your transceiver in a basic configuration using the wizard

Operating the transceiver—provides an overview of the channel screen and describes typical user-level functions such as selecting a channel and making a call

Navigating the menu structure—describes the menu structure in the user interface of the control point and how to navigate it, basic and advanced views, user and admin levels, how to enter text, and how to select entries and values

Structure of information—describes the building blocks of information in the transceiver

Channels—describes the entries for a channel and how to add a channel

Scan tables—describes the entries for a scan table and how to add a scan table

HF networks—describes the entries for an HF network and how to add an HF network

Phone links—describes the entries for a phone link and how to add a phone link

Contacts—describes the call information that you can set up for a contact and an emergency contact

Peripherals—describes how to select a peripheral on a connector, and the settings that you can change to suit your requirements

Modes—provides a summary of the modes that may be available in your transceiver

Keys and macros—provides a summary of the standard hot keys on the control point, and describes how to add your own macro and assign this to a hot key

NETs—describes the entries for a NET and how to add a NET

Messages—describes how to edit a message

Settings—describes the contents of the Control Point, Configuration, Connectors, Scan, Calling, GPS, Audio, Security, and Connectivity submenus

Access rights—provides an overview of access rights that may be set via TPS System Programmer, and how this affects access to entries in the user interface of the control point

Digital Voice options—describes the digital voice options that are available for the transceiver

Data options—describes how to set up and use modems with the transceiver

Encryption options—describes how to set up and use encryption with the transceiver

Free tune—describes how to tune to a specific receive frequency

IP remote control—provides an overview of the typical operational scenarios that use IP remote control

Multiple control points—provides an overview of multiple control points and how to register and view additional self addresses

Connectors—provides a summary of the pinouts of all connectors in the transceiver system

Specifications—provides specifications for the transceiver system

Installation—describes how to install the transceiver and antenna in a mobile or fixed situation, and how to test the installation

LED indications—describes the status of the RFU

HF radio transmission—provides an overview of communication using the medium of HF radio

Call types and features—describes each call type, the special ALE address syntaxes that can be used with these call types, and special features that may be included with a call

Definitions—explains the terms and abbreviations used in this manual

Compliance—provides information on the compliance standards that have been attained for the product

Licence information—references licence information for all open source components of the firmware

Standards and icons

The following standards and icons are used:

This typeface...	Means...
Italic	text requiring emphasis, or variable information
Bold	a key on a computer keyboard
Bold	a menu, submenu, tab, entry, a value in the user interface of the control point, or key that you press on the control point
ACTION	a hot key for a factory macro
	the user interface of the control point must be at admin level to perform the task
	the user interface of the control point must be in advanced view to perform the task
NOTE:	the text may be of interest to you
CAUTION:	proceed with caution as your actions may lead to loss of data, privacy or signal quality
WARNING:	your actions may cause harm to yourself or the equipment

Related links:

Definitions on page 601

The Envoy transceiver

Overview of the Envoy transceiver

A typical Envoy transceiver system comprises:

- a control point (2220 Handset, 2221 Handset, or 2230 Desk Console)
- a 2210 RFU
- a 12 V DC power supply
- an antenna system

The Envoy® Transceiver may be installed in fixed base and mobile stations.

Figure 1: Envoy® fixed base station

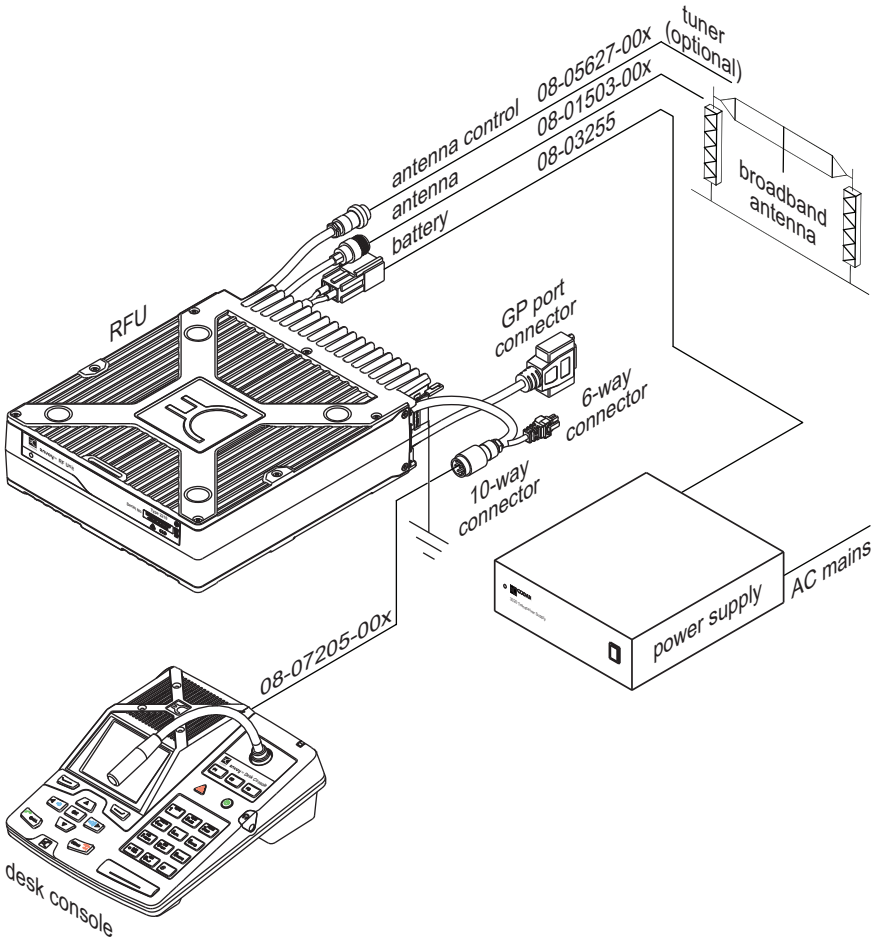
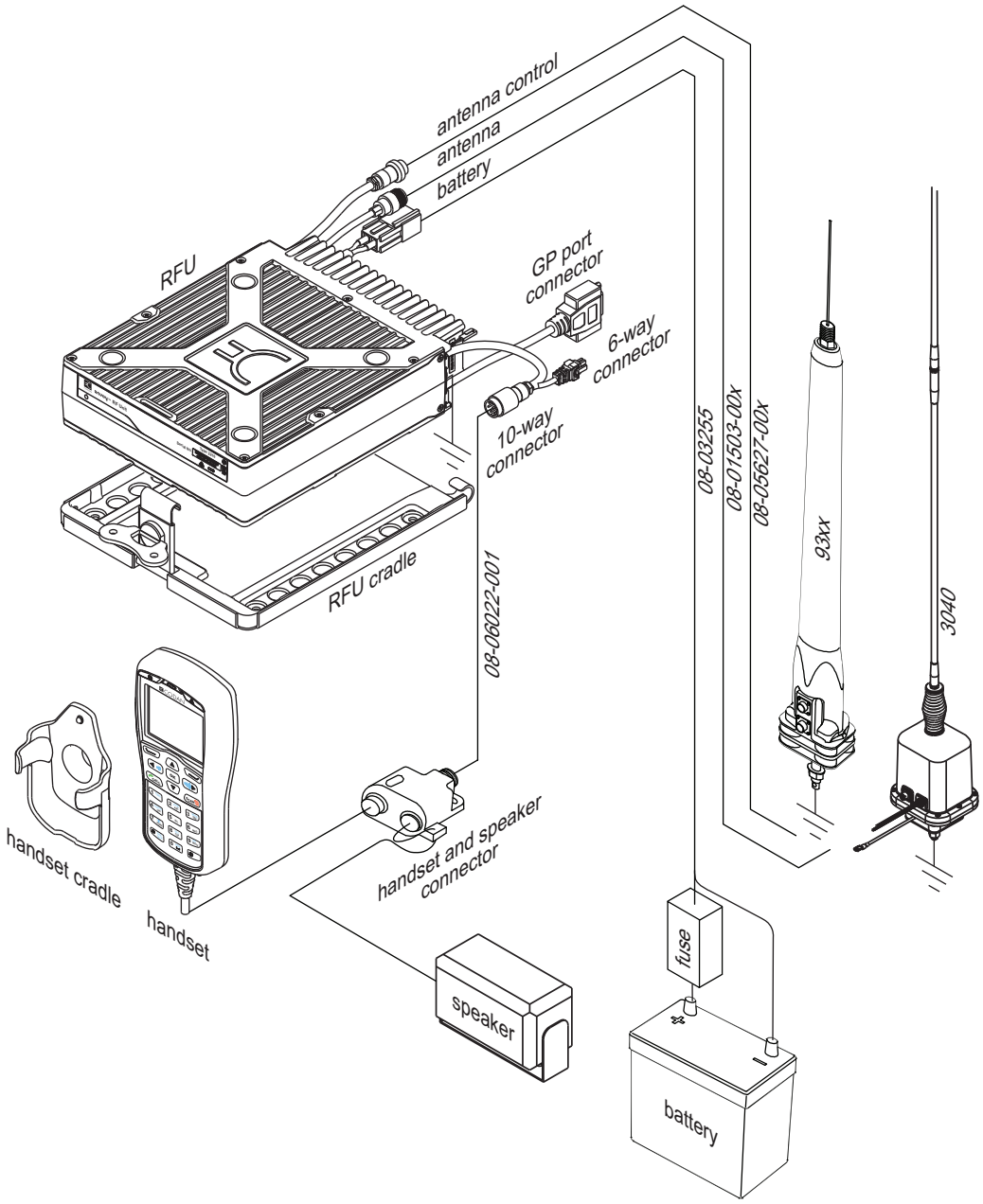


Figure 2: Envoy® mobile station



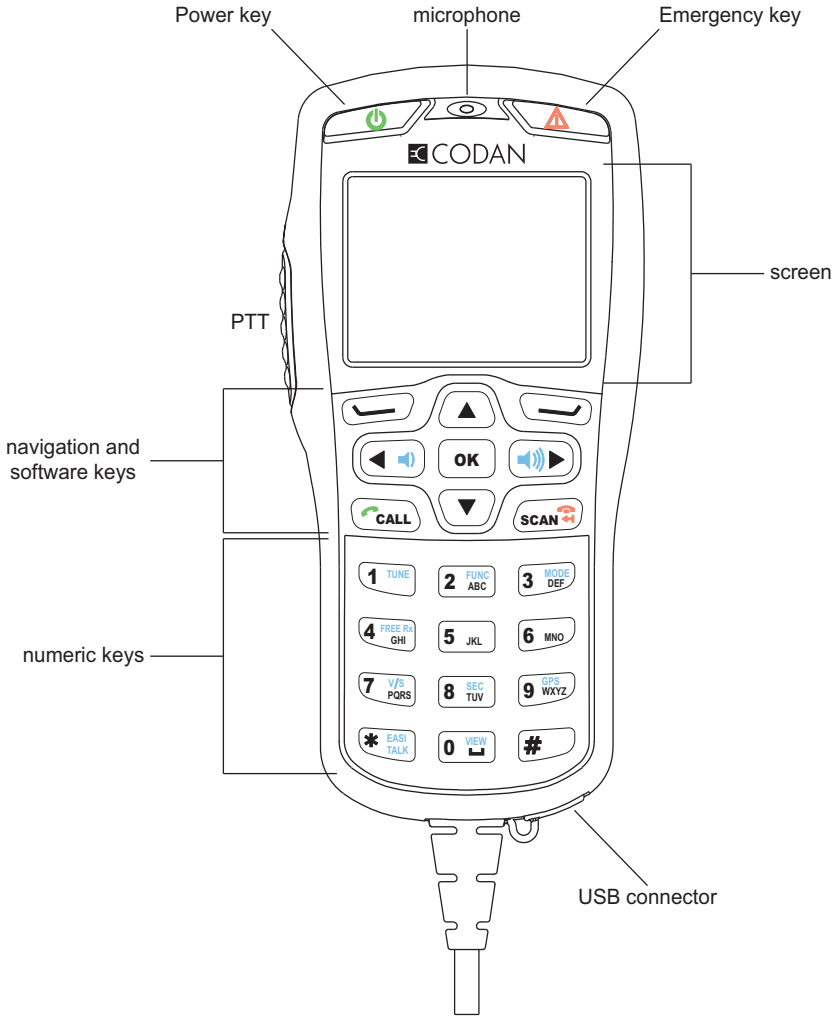
The transceiver is most easily programmed using Codan's TPS System Programmer, however, the transceiver may be set up using the control point.

A range of options and accessories is available for the Envoy transceiver. For more information contact your Codan representative or refer to the product catalogue that is applicable to your transceiver.

The 2220 Handset

The 2220 Handset is a control point for the Envoy transceiver. The user interface provides an icon-based menu structure for easy setup and operation of the transceiver.

Figure 3: 2220 Handset



The 2220 Handset is a hand-held device that has a microphone, a PTT button, a screen, navigation keys, and numeric keys. The keypad enables you to control and configure the transceiver system via the user interface. The handset and an external speaker connect to the RFU via a special interface cable.

The 2220 Handset is shipped from the factory with standard functions pre-programmed to specific keys. The standard function is written on the key in **BLUE** text. New user-defined functions may be assigned to most of the keys.

NOTE: Handsets with a Mk 2 label on the rear escutcheon are compatible with all transceiver configurations, and are specifically designed to provide a received audio signal for an Envoy SmartLink. Mk 2 handsets are identified in **Information** > **Device Information** > **Hardware Options** as **Mk 2 (Envoy SmartLink enabled)**.

Related links:

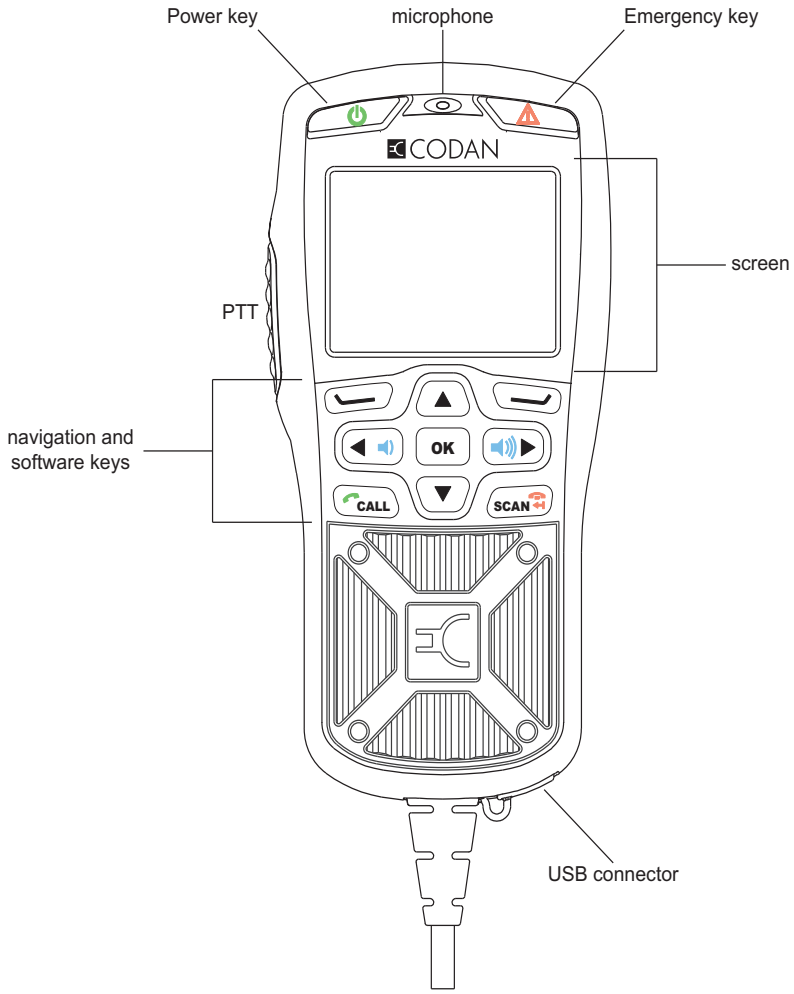
Navigating the menu structure on page 137
Keypad on page 263

The 2221 Handset

The 2221 Handset is a control point for the Envoy transceiver. The user interface provides an icon-based menu structure for easy operation of the transceiver. It has a condensed set of keys for use in simpler communication scenarios.

NOTE: This handset is recommended for operating the transceiver only. Programming the transceiver should be completed via TPS System Programmer.

Figure 4: 2221 Handset



The 2221 Handset is a hand-held device that has a microphone, a PTT button, a screen, and navigation keys. The navigation keys enable you to operate the transceiver system via the user interface using pre-defined profile information. Typically, this profile is fully configured using the TPS System Programmer. The handset and an external speaker connect to the RFU via a special interface cable.

The 2221 Handset is shipped from the factory with specific functions pre-programmed on the key, or in a general list that is accessed via the **Functions** icon ( ). New user-defined functions may be assigned to this general list.

NOTE: Handsets with a Mk 2 label on the rear escutcheon are compatible with all transceiver configurations, and are specifically designed to provide a received audio signal for an Envoy SmartLink. Mk 2 handsets are identified in **Information** > **Device Information** > **Hardware Options** as **Mk 2 (Envoy SmartLink enabled)**.

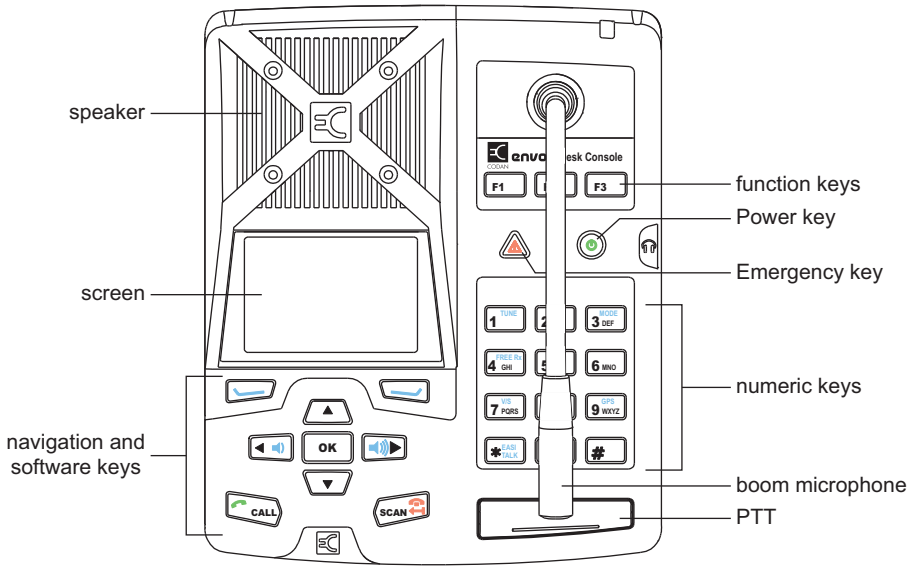
Related links:

Navigating the menu structure on page 137

The 2230 Desk Console

The 2230 Desk Console is a control point for the Envoy transceiver. The user interface provides an icon-based menu structure for easy setup and operation of the transceiver. The desk console is standard for a fixed station.

Figure 5: 2230 Desk Console



The 2230 Desk Console has an optional boom microphone, a built-in speaker, a PTT button, a screen, navigation keys, function keys, and numeric keys. The desk console also supports the use of headphones, a foot-switched PTT device, peripherals via GP port, and a separate hand microphone with PTT. The keypad enables you to control and configure the transceiver system via the user interface.

The 2230 Desk Console is shipped from the factory with standard hot keys programmed to the numeric keys. The function that each standard hot key performs is written on the numeric key in **BLUE** text. New user-defined functions may be assigned to most of the keys.

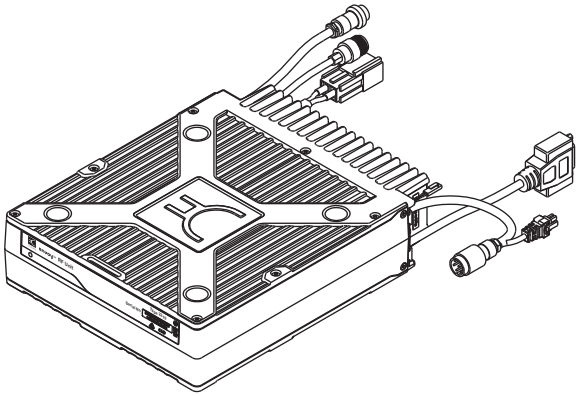
Related links:

Navigating the menu structure on page 137
Keypad on page 263

The 2210 RFU

The RFU modulates audio signals onto radio frequencies that can be transmitted on air, and demodulates the radio frequencies it receives into audio signals. It also interprets the instructions that you enter through the control point.

Figure 6: 2210 RFU



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2 Using the wizard

This section contains the following topics:

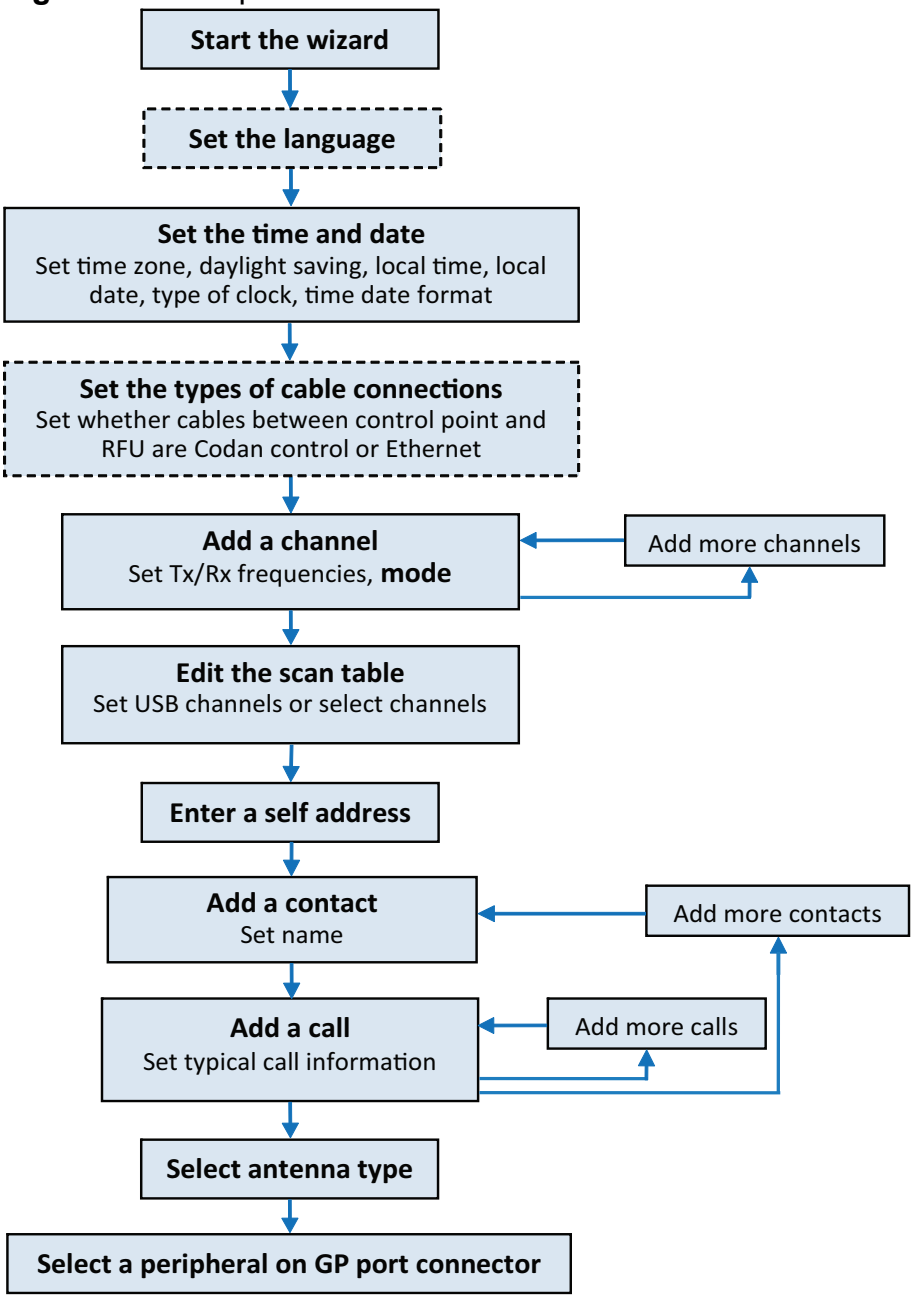
Overview of the wizard

The wizard is available if the transceiver:

- has not been programmed with a profile
- has a basic profile that has the same self address for each of the default HF networks: Selcall and CALM
- has one scan table

The wizard steps you through setting up information in the transceiver so that it may be operated at a basic level.

Figure 7: Steps in the wizard

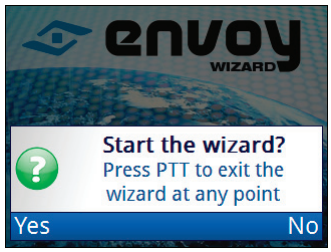


NOTE: If you require more detail on any of these tasks, please see the related links at the end of each topic.

Using the wizard

The wizard should start automatically when a new transceiver is powered up for the first time.

Figure 8: Wizard Startup screen



NOTE: If the wizard screen doesn't launch automatically, follow the instructions below. If your transceiver has been profiled using the TPS System Programmer, the wizard may not be available.

To use the wizard:

- Press PTT, then press (**Menu**) to return to the top level of the menu structure.

- Highlight the icon for the wizard (), then press (**OK**).

  If the icon is not visible, then the wizard is not available as the transceiver has been programmed already with a non-basic profile.

- Press (**Yes**) to confirm that you want to start the wizard.

  If you want to bypass the wizard, press (**No**).

Selecting a language

NOTE: This step in the wizard is shown if you have multiple languages available.

To select a language:

- Press ▲ or ▼ to scroll to the language that you want to use on the control point, then press **OK**.

  NOTE: The label above the ⌐ key appears in the selected language.

- Press ⌐ (**Save**) to save the information.

Related links:

Selecting a language on page 43

Setting the time and date

To set the time and date:

- Press ◄ or ► to select the time zone that you want to use.
- Press ▼ to move to the **Daylight Saving** entry.
- Press ◄ or ► to select the time that you want to use.
- Press ▼ to move to the **Local Time** entry.
- Press ► to enter edit mode for the local time.
- Press ▲ or ▼ to scroll to the value that you want to set, then press ► to move to the next item.
- Repeat this for minutes, seconds and AM/PM values.
- Press ⌐ (**Save**) to save the local time.
- Press ▼ to move to the **Local Date** entry.
- Press ► to enter edit mode for the local date.
- Press ▲ or ▼ to scroll to the value that you want to set, then press ► to move to the next item.
- Repeat this for the day/month and year, as required.
- Press ⌐ (**Save**) to save the local date.
- Press ▼ to move to the **Clock** entry.
- Press ◄ or ► to select the type of clock that you want to use.
- Press ▼ to move to the **Time Format** entry.
- Press ◄ or ► to select the format that you want to use.
- Press ▼ to move to the **Date Format** entry.
- Press ◄ or ► to select the format that you want to use.
- If you want to review the information that you have entered, press ▲ or ▼ to move through the entries.

- Press (**Save**) to save the information.

  If you have not changed any of the time and date information, press (**Close**).

Related links:

Setting the time and date on page 44

Setting the types of connections between modules

NOTE: This step in the wizard is shown if your control point is a desk console, or a Mk 2 handset connected via an Envoy SmartLink.

The types of cables used to connect the modules in your system affect whether or not the control point can power down and power up the RFU.

To set the types of connections:

- Do *one* of the following:
  - If at least one connection between the control point and the RFU uses an Ethernet cable, press (**Yes**), then continue from *Adding a channel* on page 16.
  - If all connections between the control point and the RFU use Codan control cables, press (**No**), then continue from *Adding a channel* on page 16.

Related links:

Setting the power-down function of a control point on page 47

Adding a channel

NOTE: This step in the wizard is shown if you are permitted to add channels.

To add a channel:

- Press (**Yes**) to add a channel, if required.
- Enter the name that you want to use for the channel.
- Press ▼ to move to the **Tx** entry.
- Enter the transmit frequency that you want to use for this channel (in kHz, with up to three decimal points or 1 Hz resolution).
- Press ▼ to move to the **Rx** entry.

  The **Rx** entry is automatically filled with the transmit frequency.

- Enter the receive frequency (in kHz, with up to three decimal points or 1 Hz resolution), if required to be different from the Tx frequency.
- Press ▼ to move to the **Mode** entry.
- To select a mode:
  - Press ▶ to view the list of available modes.
  - Press ▲ or ▼ to scroll to the mode that you want to use, then press **OK**.

    When the check box is selected, the item is enabled. When the check box is clear, the item is disabled.
  - Select other modes, as required.

    NOTE: The modes that you select become the allowed modes for this channel. In a scan table, you can duplicate a channel and select another of the allowed modes.
  - Press (**Save**).
- If you want to review the information that you have entered, press ▲ or ▼ to move through the entries.
- Press (**Save**) to save the information.
- Do *one* of the following:
  - If you want to add another channel, press (**Yes**), then repeat these steps.
  - If you do not want to add another channel, press (**No**).

  The channels that you enter may be allocated to a scan table. A scan table enables you to manage how these channels are scanned using one set of properties.
- Do *one* of the following:
  - If you want to add a scan table, press (**Yes**).
  - If you do not want to add a scan table, press (**No**), then continue from *Entering a self address* on page 18.
- Do *one* of the following:
  - If you want to scan all of the channels in the transceiver that have a USB mode, press (**Yes**), then continue from *Entering a self address* on page 18.
  - If you want to choose the channels and modes that you want to scan, press (**No**), then continue from *Adding channels to a scan table* on page 18.

Related links:

Overview of scan tables on page 182
Overview of HF networks on page 194
Adding a channel on page 177

Adding channels to a scan table

To add channels to a scan table:

- Press ▲ or ▼ to scroll to the channel that you want to add, then press **OK**.
- Press ◀ or ▶ to select the mode that you want to use.
- Select more channels, as required.
- Press ⌐ (**Save**) to add these channel selections.
- Continue from *Entering a self address* on page 18.

Entering a self address

A self address is used by other stations to call your station. For example, if the self address of your station is 1234, operators at other stations enter the address 1234 when they want to make a call to you.

To enter a self address:

- Enter the address that you want to use.

  You can enter up to six digits, or you may leave the self address blank if a peripheral device has its own self address set.

  NOTE: Addresses ending in one or more 9 or 0 digits have a special function in Selcall HF networks.

- Press ⌐ (**Save**) to save the information.

  NOTE: The wizard automatically allocates this self address to the default HF networks: Selcall and CALM (if FED-STD-1045 ALE or MIL-STD-188-141B ALE option is installed).

- Do *one* of the following:
  - If you want to add a contact, press ⌐ (**Yes**), then continue from *Adding a contact* on page 19.
  - If you do not want to add a contact, press ⌐ (**No**), then continue from *Selecting an antenna* on page 22.

Related links:

RFU GP Port Startup on page 243
RFU 6way Startup on page 249

Adding a contact

A contact is a person or organisation that you want to call, and for which you want to pre-define the method of calling. You may be able to contact the same person or organisation via a number of different methods. When you set up the contact, you define each method as a separate call for the contact.

To add a contact:

- Enter the name that you want to use for the contact, then press (**Add Call**).

  The **HF Network** entry is highlighted.

  The HF network defines the call system and self address that is used by your station when the call is made. For example, if you are using a Selcall HF network, you must select a channel for the call. If you are using an ALE/CALM HF network, you may either select a channel or let the transceiver select a channel for the call.

- Press ◀ or ▶ to select the HF network that you want to use.
- Press ▼ to move to the **Call Type** entry.
- Press ◀ or ▶ to select the call type that you want to use.

  NOTE: The call type that you select affects information that you can enter for the remainder of this call.

- If you are adding:
  - a Selective, Channel Test, Emergency, Get Position or Send Position call, continue from *Adding a simple call* on page 19
  - a Message call, continue from *Adding a Message call* on page 20
  - a Phone call, continue from *Adding a Phone call* on page 21

Related links:

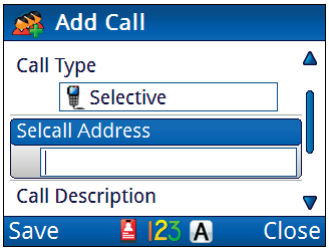
Contacts on page 213
Call types on page 574

Adding a simple call

A simple call is a call that requires an address only at this stage of the definition process.

To continue with adding a Selective, Channel Test, Emergency, Get Position or Send Position call:

- Press ▼ to move to the **Address** | **Selcall Address** | **ALE Address** entry.



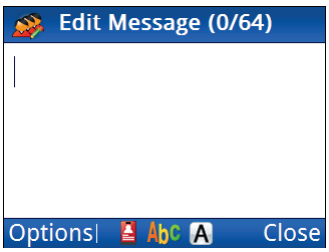
- Enter the address of the station that you want to call.
- Continue from*Completing the contact* on page 22.

Adding a Message call

To continue with adding a Message call:

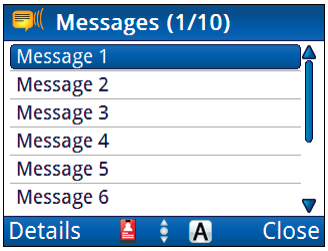
- Press ▼ to move to the **Address** | **Selcall Address** | **ALE Address** entry.
- Enter the address of the station that you want to call.
- Press ▼ to move to the **Message** entry, then press ▶.

  NOTE: If you want to be prompted to enter a message at the time of the call, leave the value for the **Message** entry as **<Empty>**.



- If you want to enter a message:
  - *Hold* **#** to select a different input language, if required.
  - Start typing the message.

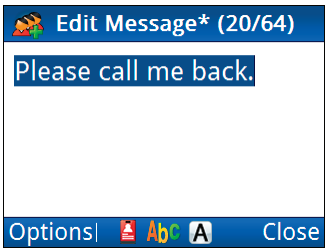
    NOTE: Press **OK** to start a new line, if required.
  - Press (**Options**), scroll to **Save**, then press (**Select**) to add the message to the call.
- If you want to select a message from a list of stored messages:
  - Press (**Options**), scroll to **Stored**, then press (**Select**).



- Press ▲ or ▼ to scroll to the message that you want to use.

  NOTE: If you want to view the message, press ⌐ (**Details**) to view the message, then press ⌐ (**Close**).

- Press **OK** to select the message.
- Edit the message, if required.



- Press ⌐ (**Options**), scroll to **Save**, then press ⌐ (**Select**).

□ Continue from *Completing the contact* on page 22.

Adding a Phone call

To continue with adding a Phone call:

□ Press ▼ to move to the **Phone Number** entry.

□ Enter the phone number.

□ Continue from *Completing the contact* on page 22.

Completing the contact

To finish entering the information required for the contact:

- Press ▼ to move to the **Call Description** entry.

  The call type is entered automatically as the call description.
- Enter a new description for this call, if required.
- Press (**Save**) to save the information.
- If you want to add another call for the contact, press (**Yes**), then repeat the steps for adding a call.

  If you do not want to add another call, press (**No**).
- If you want to add another contact, press (**Yes**), then repeat the steps for adding a contact.

  If you do not want to add another contact, press (**No**).
- Do *one* of the following:
  - If you want to select an antenna, continue from *Selecting an antenna* on page 22.
  - If you do not want to select an antenna, press (**Close**), then continue from *Selecting a peripheral device* on page 23.

Related links:

Adding a contact on page 19

Selecting an antenna

Each type of antenna has a specific requirement for tuning, and the transceiver uses a different protocol for each one. You must select the type of antenna that is used in your station so that the transceiver knows how to tune the antenna. Some antennas, such as broadband antennas, do not require tuning.

To select an antenna:

- Press ▲ or ▼ to scroll to the antenna type that you want to use, then press **OK**.
- Press (**Save**) to save the information.

- Do *one* of the following:
  - If you want to connect an accessory to the GP port connector of the RFU, press (**Yes**), then continue from *Selecting a peripheral device* on page 23.
  - If you do not want to connect an accessory, press (**No**), then press **OK** to close the wizard.

Selecting a peripheral device

A peripheral device is any piece of equipment that is connected to the antenna control, RFU GP port, RFU 6-way or Console GP port connector. Each device may have a number of different properties that need to be defined for optimum performance. When you select the peripheral device from the list, the transceiver automatically sets these properties.

NOTE: Codan peripheral devices are listed by their type number, for example, 3031 Crosspatch. The type number for a Codan device is located on the front or serial number escutcheon.

To select a peripheral device:

- Press ▲ or ▼ to scroll to the type of peripheral device that is attached to the connector, then press **OK**.

  If there are settings that you can change to customise this peripheral for your requirements, ▶ is shown to the right of the peripheral name when it is selected.
- If you want to change settings for the peripheral, press ▶ to see the list of entries that you may change.

  If the value of an entry for a peripheral device has been changed from the default value, is shown next to the title of the entry.
- Press (**Save**) to automatically update settings for correct operation of the connected peripheral device.
- Press **OK** to close the wizard.
- If you added a peripheral device, and a prompt to restart the transceiver is displayed, accept it to to activate the new settings.

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3 Operating the transceiver

This section contains the following topics:

Switching the transceiver on and off

Switching on the transceiver

To switch on the transceiver:

- Press ⏻.

  The template screen, then the welcome screen (if set) are shown briefly, followed by the channel screen.

Switching off the transceiver

The power-down function controls which modules are switched off. In some instances, it may only be the control point that switches off and the RFU remains powered. The default behaviour is for both the control point and the RFU to switch off.

To switch off the transceiver:

- Do *one* of the following:
  - *Hold* ⏻ for 2 sec, then release.
  - Press ⏻, then press **OK**.

NOTE: The transceiver is switched off.

Related links:

Setting the power-down function of a control point on page 47

The channel screen

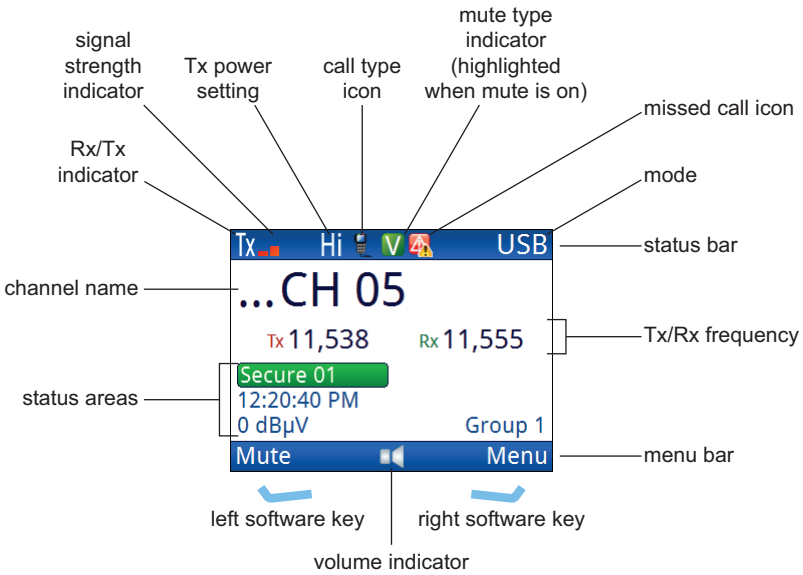
The channel screen shows the following information:

- the name of the currently selected channel

  NOTE: If **...** is shown before the channel name, then this channel is contained within a channel group.

- the transmit and receive frequencies, if applicable
- the status areas that show specific information about the transceiver
- a bar graph that indicates the signal strength on receive (green) and the output power on transmit (red)
- the transmit power level setting
- the call type icon (when calling) or the scan indicator (when scanning, see Figure 11)
- the mute type indicator
- a missed call icon, if applicable
- the mode
- the crosspatch indicator, if connected
- the clarifier indicator, if set
- calling and system locks when the RFU is being used by a connected data application or another control point (see Figure 10)

Figure 9: Channel screen



NOTE: If you cannot transmit on the channel, **Inhibit** is shown as the Tx frequency.

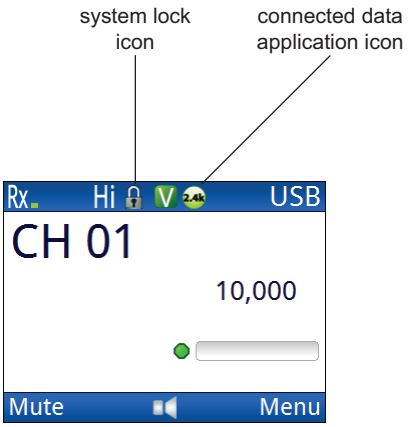
If the transmit and receive frequencies are the same, the frequency is only shown on the right side of the screen. The Rx/Tx indicator shows whether the transceiver is receiving (green) or transmitting (red). The more bars that are shown, the higher the signal strength.

The status area of the screen provides six separate areas in which you can show information that is relevant for your operations. Your system administrator can choose the information that is shown in each status area. If encryptor/scrambler options are enabled, this information is shown in the top line of the status area (status areas 1 and 2). Any selections that have been made are discarded.

Your transceiver may have the option of selecting high, medium, or low power, as set in **Settings** > **Configuration** > **Tx Power**. By default, you can toggle between the Tx power settings by pressing the **6** key. **Hi**, **Med**, or **Lo** is shown respectively to the right of the signal strength indicator. If an external power amplifier is connected, **PA** may also be selected.

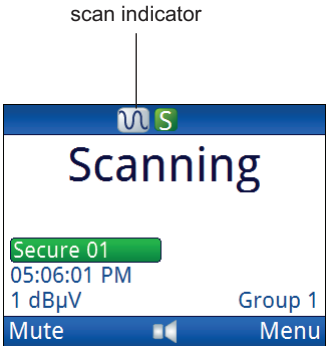
While a call is being established, the transceiver shows that calling activity is in progress by flashing in place of the scan indicator. Once a call is established, these indicators are replaced with an icon that represents the type of call being sent or received.

Figure 10: System lock and connected data application icons



When the transceiver is scanning, the channel screen is replaced by the scanning screen.

Figure 11: Scanning screen



Related links:

Call types on page 574
Selecting information to be shown in a status area on page 31
Group on page 173
Tx Power on page 330
Overview of multiple control points on page 490
Overview of the 3031 Crosspatch on page 113
Using the clarifier on page 83

Selecting a channel

To select a channel:

- Press PTT to exit to the channel or scanning screen.
- If the transceiver is scanning, press **SCAN** to switch off scanning.

- Press ▲ or ▼ to scroll to the channel that you want to use.

  The channel is selected.

  NOTE: If you want to change the sideband, press **MODE**. If the mode does not change, there is only one mode for the channel.

  NOTE: If you have an automatic antenna tuner fitted, press PTT to tune the antenna to the currently selected channel.

- Do any of the following:
  - *Hold* **OK** to edit the channel, if permitted.
  - Press **OK** to search for a channel.
  - Press **CALL** to start a call.
  - *Hold* **CALL** to go to Contacts.

Related links:

Finding a word or value on page 148
Selecting information to be shown in a status area on page 31
Selecting a channel from a channel group on page 30
Call Key Options on page 310

Selecting a channel from a channel group

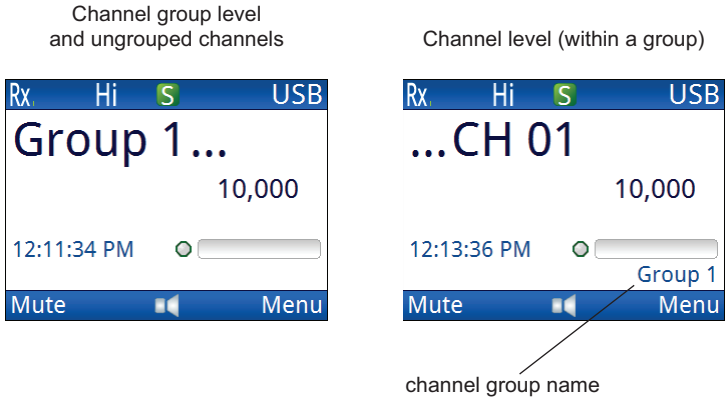
If channel grouping is enabled in **Settings** > **Control Point** > **Channel Grouping** and you have allocated channels to groups, indicated by **...** after a channel group name or in front of the channel name, you may have to switch to another channel group to find the channel that you want to select.

NOTE: Any channels that are not assigned to a channel group appear at the top level with the channel group names. These channels are selected by scrolling to the channel.

NOTE: You can set the name of the current channel group to show in a status area of the channel screen.

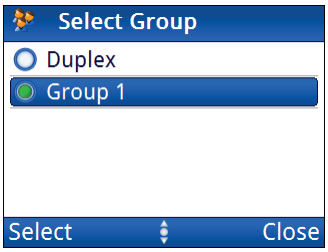
To select a channel from a channel group:

- Press PTT to exit to the channel or scanning screen.
- If the transceiver is scanning, press **SCAN** to switch off scanning.



- If you are at the channel group level, which may include ungrouped channels, press ▲ or ▼ to scroll to the channel group that you want, then press # to view the channels within that group.
- If you are within a channel group but the channel that you want is not visible, do *one* of the following:
  - Press # to move to the channel group level, press ▲ or ▼ to scroll to the channel group that you want, then press #.

- *Hold* # to see a list of channel groups, press ▲ or ▼ to scroll to the channel group that you want, then press ⎯ (**Select**).



- Press ▲ or ▼ to scroll to the channel that you want to use.

  The channel is selected.

  NOTE: If you want to change the sideband, press **MODE**. If the mode does not change, there is only one mode for the channel.

  NOTE: If you have an automatic antenna tuner fitted, press PTT to tune the antenna to the currently selected channel.

- Do any of the following:
  - *Hold* **OK** to edit the channel, if permitted.
  - Press **OK** to search for a channel.
  - Press **CALL** to start a call.
  - *Hold* **CALL** to go to Contacts.

Related links:

Selecting information to be shown in a status area on page 31
Group on page 173
Channel Grouping on page 309

Selecting information to be shown in a status area

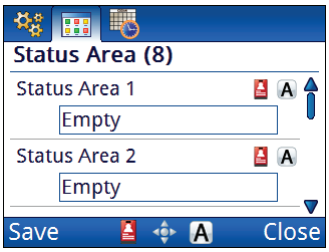
There are six status areas on the channel screen, scanning screen, and free-tune screen that provide operational information directly to the user.

Figure 12: Status areas

NOTE: Information in status areas 1 and 2 is replaced by the secure status when a voice and/or data encryptor is available.

To select information to be shown in a status area:

- From the main menu, select (**Settings**), then (**Control Point**).
- Press ◀ or ▶ to select the **Status Area** tab.



- Press ▲ or ▼ to scroll to the status area in which you want to show status information.
- Press ◀ or ▶ to select the status information that you want to show.

Table 1: Information that may be shown in the status areas on the screen

Item	Description
Empty	Status area is blank
Transceiver type	Read from the template in the transceiver, for example, Envoy X1 or Envoy X2
User-defined text 1/2	Any text that you want to show on the screen
Altitude, Latitude/Northing, Longitude/Easting, Speed	Derived from GPS signals from a GPS receiver or from My Position information (latitude and longitude only)
PA temperature	Temperature of the power amplifier shown in °C
Tx power	Monitored transmit power from the transceiver shown in W
Rx level	Strength of an incoming signal shown in dBµV
Voltage	Battery voltage shown in V
Last received call	Who and when details of the last call received
SWR	The ratio of forward to reflected power of the antenna during transmit (typical range 1:1.0 to 1:1.8, which is only valid on the current channel)
Date, Time, Time Zone	Current date, time and time zone of the control point
Package version, Package build date	Details of the firmware in the control point and RFU (V1.0)
Primary self address	Self address of the first-listed HF network in your transceiver
Last received address	Contact name or address of the last call received (➡)
Last self address used	Self address of your transceiver that was used with the last call that you made (⬅)
Profile name	Name of the TPS profile programmed into the transceiver
CP IP address, RFU IP address	IP address of the control point (📱) or RFU (📡)
Power down time	Time at which the transceiver will power down, in 24-hour format (⏻)

Table 1: Information that may be shown in the status areas on the screen

Item	Description
Channel group	Name of currently selected channel group, if **Settings** > **Control Point** > **Channel Grouping** is set to **Enabled** and there are channel groups set up on the **Channels** tab
Crosspatch state	Current crosspatch state may be **Off** ( ) | **Active** ( ) | **Standby** ( ) | **Disconnected** ( )
2.4 kbit/s Data Modem throughput	 Grey LED, solid: modem is not in a link Green LED, solid: modem is enabled and a computer is communicating with it via VCOM Green LED, flashing: modem is in a link and received the link Red LED, flashing: modem is in a link and started the link Red bar is indicative of the data throughput rate for the link
Zone (UTM)	Zone, if UTM is selected in **Settings** > **GPS** > **GPS Format Options**

- Press (**Save**) to save the information.

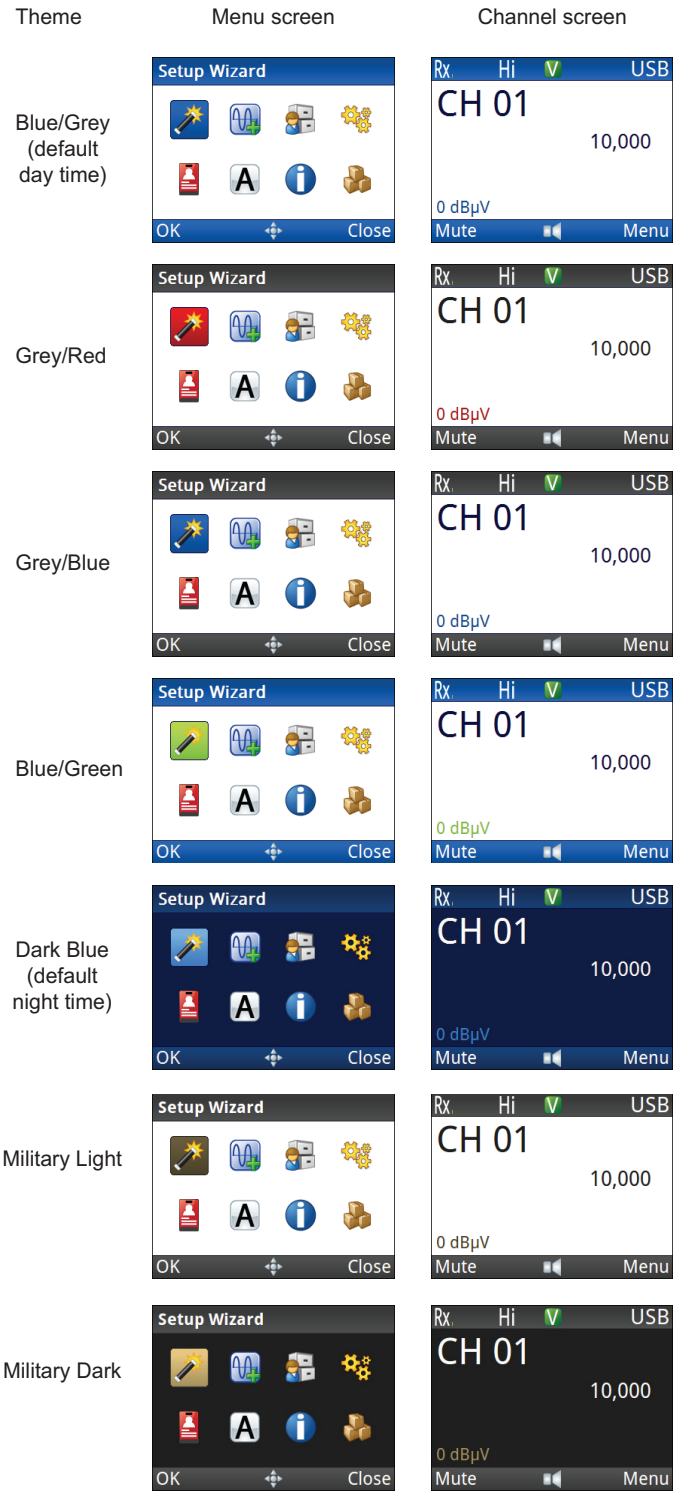
Related links:

Settings > Control Point > Status Area on page 322

Selecting a theme

You can select one of the following themes for the display in the control point. You can select one theme for use during the day, and another for use during the night.

Figure 13: Available themes for the display in the control point



To select a theme:

- From the main menu, select (**Settings**), then (**Control Point**).
- Press ▲ or ▼ to scroll to the **Theme** or **Night Theme** entry.
- Press ◀ or ▶ to select the theme that you want to use.

- If you have set a night theme, do the following:
  - Press ▲ or ▼ to scroll to the **Night Display Start** entry.
  - Press ◀ or ▶ to select the time that you want to start displaying the night theme.
  - Press ▼ to move to the **Night Display Stop** entry.
  - Press ◀ or ▶ to select the time that you want to start displaying the day theme.
- Press ⌐ (**Save**) to save the information.
- Switch the transceiver off then on again to activate the new theme.

Scanning channels

If you intend to receive calls on several channels, switch on scanning. When scanning is switched on, the transceiver sequentially selects each channel/mode in your scan tables to detect incoming calls. The channels are scanned in a continuous cycle. By default, mute is switched on automatically when scanning is switched on.

NOTE: Only those scan tables that are set to be scanned have the channels scanned. Up to 100 channels may be scanned.

By default, when the transceiver detects a call addressed to your station, it stops scanning and notifies you according to the type of call received. When you press to end the call, scanning resumes. If you do not press this key to end the call, or any other key within a pre-determined timeout, the transceiver automatically ends the call and resumes scanning.

NOTE: The default standby state for the transceiver is to return to scanning so that it is ready to receive calls across a range of frequencies.

When the transceiver detects a signal, it notifies you according to the mute setting selected. If your transceiver is set to notify you when voice is detected (**V**), you can pause scanning, select the channel/mode on which the voice was heard, then resume scanning when required. Voice mute also detects calls that are addressed to any station on the scanned frequency, and any other channel disturbances. If your transceiver is set to selcall mute (**S**), it only pauses scanning when it detects a call addressed to your station, regardless of the call system used.

Your choice of voice or selcall mute depends on whether or not you have to detect voice signals, and how much noise and traffic you want to hear.

It is recommended that scanning is switched on when you are not using the transceiver to communicate so that you are able to receive calls on any frequency in the scanned scan tables.

Related links:

Adding a scan table on page 187
Call types on page 574
Muting the transceiver on page 39
Settings > Scan on page 338

Switching scanning on or off

To switch scanning on or off:

- Press **SCAN**.

  If a call is not in progress, scanning is toggled on or off.

  If a call is in progress, the call is ended and the transceiver begins scanning.

  If a call from a modem (or any other peripheral device) is in progress, you are prompted to break the system lock to resume scanning.

NOTE: When scanning is switched on, mute is also switched on.

NOTE: If you press PTT while the transceiver is scanning, the scan is stopped.

Pausing scanning

To pause scanning:

- Do *one* of the following:
  - To pause scanning on the last-selected channel, press **OK**.
  - To pause scanning and scroll to another channel, press ▲ or ▼.

  The channel/modes through which you can scroll are those in the scan tables that are being scanned. They are not listed alphabetically but in the order in which they are being scanned.

  If you do not press a key within 30 sec, the transceiver automatically resumes scanning, by default.
- While scanning is paused, do *one* of the following:
  - To speak on the selected channel, *hold down* PTT.
  - To resume scanning immediately, press **OK**.
  - To stop scanning completely, press **SCAN**.

Muting the transceiver

When the transceiver is set to a channel or is scanning channels, and mute is switched off, you hear on-air signals on each channel. If you do not want to listen to this, you can silence the transceiver by switching on mute.

You can set the mute to switch off when a voice signal or any other calling activity is detected (voice mute **V**), or only when a call addressed to your station is received (selcall mute **S**). Your choice of voice or selcall mute depends on whether or not you have to detect voice signals, and how much noise and traffic you want to hear. When digital voice is active and scanning is switched off or paused, you can also set the mute to switch off only when a secure or clear digital voice signal is detected (digital voice mute **D**). The voice signal is output to the speaker connected to the RFU or desk console speaker.

By default, mute automatically switches on when the transceiver starts scanning. The transceiver listens for signals according to what is set in **Settings** > **Scan Mute**.

If the scan is paused due to voice being detected, the length of time that the transceiver holds the pause with mute off is set in **Settings** > **Scan Voice Max Pause** and **Scan Voice Extend**. Scanning only resumes automatically if the transceiver is set to start scanning after a timeout period.

Related links:

Scan Mute on page 338
Scan Voice Max Pause on page 339
Scan Voice Extend on page 339
Auto Resume Mode on page 338
Auto Resume Time on page 338

Switching mute on or off

To switch mute on or off:

- If you are using a 2220 Handset or 2230 Desk Console, press (**Mute**) on the channel screen, scanning screen, or free-tune screen.
- If you are using a 2221 Handset:
  - Press (**Options**).
  - Press ▲ or ▼ to scroll to the **Mute On**|**Off** option.
  - Press (**Select**).

  The **V** or **S** in the status bar of the channel screen is highlighted when mute is on.

Selecting the mute type

To select the mute type:

- If you are using a 2220 Handset or 2230 Desk Console, press V/S to toggle the mute type between selcall mute (**S**) and voice mute (**V**).
- If you are using a 2221 Handset:
  - Press (**Options**).
  - Press ▲ or ▼ to scroll to the **V/S** option.
  - Press (**Select**).

NOTE: When digital voice is active and scanning is switched off or paused, an additional digital voice mute (**D**) is available.

Related links:

Digital voice mute on page 391

Using the microphone

The microphone on the handset is located at the top between the ⏻ and ⚠ keys. When you talk into the microphone:

- hold the microphone side-on and close to your mouth
- *hold down* PTT
- speak clearly at your normal volume and rate
- release PTT to return to receiving mode

On the desk console, you can speak directly into the boom microphone.

NOTE: By default, the transceiver is set up to transmit a short beep when you release PTT. This removes the need for you to say 'over' at the end of your transmission.

CAUTION: Your conversation can be monitored by anyone tuned to your transmit frequency, unless you are using one of Codan's encryptors. Your signal can potentially travel very large distances.

If PTT is held continuously for a certain length of time, the system stops transmission, switches to receive and shows an error message on the control point. This ensures that, even if the PTT button is being held down accidentally, the battery will not be flattened, and your transceiver is ready to receive calls.

You can set the length of time the system waits before it cuts transmission (default is 10 min), or switch off this feature.

Related links:

The 2220 Handset on page 5
The 2221 Handset on page 7
The 2230 Desk Console on page 8
Handset PTT Beep on page 332
PTT Timeout on page 333
Encryption options on page 423

Manually tuning the antenna

WARNING: Before using the antenna system see the safety information provided.

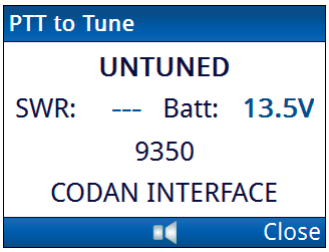
NOTE: If the transceiver is connected to an automatic tuning antenna, it tunes the antenna automatically when required.

You may need to manually tune the antenna if you are receiving on a new channel, or if you want to check the SWR value for the antenna.

To manually tune the antenna:

- Press TUNE.

  The SWR, battery voltage, and type of antenna tuner are shown on the screen.



- *Hold down* PTT to start the tuning process.

  The transceiver makes a series of short beeps.

  An SWR of less than 2.0 is acceptable.

  NOTE: If PTT is *held* for more than 2 minutes, tuning is automatically aborted. The transceiver displays a message to inform you of this, makes an error beep, and returns you to the screen from which you began.

- Release PTT to stop tuning.

  The beeps cease and you are returned to the screen from which you began.

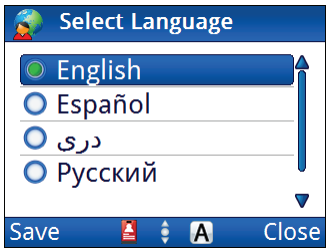
Related links:

Radiation safety (EU installations only) on page 617
Radiation safety (non-EU installations) on page 619

Selecting a language

The default language for the control point is English, however, you may have other language options available for the control point.

Figure 14: Select Language screen



To select a language:

- From the main menu, select (**Select Language**).
- Press ▲ or ▼ to scroll to the language that you want to use on the control point, then press **OK**.

  NOTE: The label above the key appears in the selected language.
- Press to save the selection and change the user interface to this language.

Setting the time and date

The transceiver is set to UTC time in the factory. You set the local time and time zone for the location of the control point. This feature is useful if you have a communication network that spreads over several time zones, or you need to time stamp your transmissions according to the current time at longitude zero.

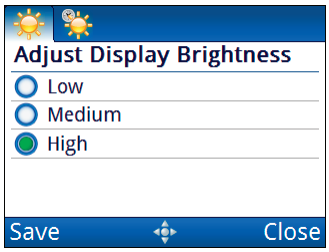
To set the time and date:

- From the main menu, select (**General**), then (**Time and Date**).
- Press (**Set**).
- Press ▼ to move to the **Time Zone** entry.
- Press ◀ or ▶ to select the time zone that you want to use.
- Press ▼ to move to the **Daylight Saving** entry.
- Press ◀ or ▶ to select the time that you want to use.
- Press ▼ to move to the **Local Time** entry.
- Press ▶ to enter edit mode for the local time.
- Press ▲ or ▼ to scroll to the value that you want to set, then press ▶ to move to the next item.
- Repeat this for minutes, seconds and AM/PM values.
- Press (**Save**) to save the local time.
- Press ▼ to move to the **Local Date** entry.
- Press ▶ to enter edit mode for the local date.
- Press ▲ or ▼ to scroll to the value that you want to set, then press ▶ to move to the next item.
- Repeat this for the day/month and year, as required.
- Press (**Save**) to save the local date.
- Press ▼ to move to the **Clock** entry.
- Press ◀ or ▶ to select the type of clock that you want to use.
- Press ▼ to move to the **Time Format** entry.
- Press ◀ or ▶ to select the format that you want to use.
- Press ▼ to move to the **Date Format** entry.
- Press ◀ or ▶ to select the format that you want to use.
- If you want to review the information that you have entered, press ▲ or ▼ to move through the entries.
- Press (**Save**) to save the information.

Setting the brightness of the display

To set the brightness:

- Do *one* of the following:
  - Press + **0**.
  - From the main menu, select (**General**), then (**Brightness**).



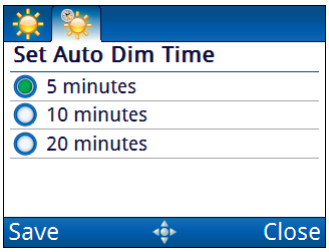
- Press or to scroll to the value that you want to set, then press **OK**.
- Press (**Save**) to save the information.

Setting the display timeout

You can set the length of time that the display and keypad backlight remains on after the last activity on the control point. After this time, the backlight value drops to **Low**. When a key is pressed, the backlighting returns to the value set in the **Brightness** entry.

To set the display timeout:

- Do *one* of the following:
  - Press + **0**.
  - From the main menu, select (**General**), then (**Brightness**).
- Press ▶ to move to the **Set Auto Dim Time** tab.



- Press ▲ or ▼ to scroll to the value that you want to set, then press **OK**.
- Press (**Save**) to save the information.

Related links:

Setting the brightness of the display on page 45

Setting the power-down function of a control point

Control points may be connected directly to the RFU using a Codan control cable, or they may be connected with Ethernet cabling. If Ethernet cabling is used, the control point is not able to switch on the RFU, so in this case, you do not want to power-down the RFU. You should choose **Control point only**.

An Ethernet switch, a LAN, a WAN with VPN, or Envoy SmartLink may be used to connect multiple control points to the RFU. Connection diagrams are provided in the related link below.

NOTE: For more information on systems that include an Envoy SmartLink, please see the *2240 Envoy SmartLink™ Reference Manual* (Codan part number 15-04168-EN).

The TPS System Programmer has a **Default Power-down Function** entry that enables you to set this initial state to all control points in a multiple control point system. The value in the **Power-down Function** entry at the local control point overwrites the value set in the control point by the **Default Power-down Function** entry.

NOTE: If a link is fitted to P901 on the Control and Audio PCB in the RFU (Codan part number 08-07158), or cable 08-07215-001 is used in the system, the RFU restarts automatically after power down.

To set the power-down function of a control point:

- From the main menu, select (**Settings**), then (**Control Point**).
- Press ◀ or ▶ to select the **General** tab.
- Press ▼ to move to the **Power-down Function** entry.
- Press ◀ or ▶ to select the value that you want to use from the following:
  - If all connections between the control point and the RFU use Codan control cables, select **Control point and RFU**.
  - If at least one connection between the control point and the RFU uses an Ethernet cable, select **Control point only**.
- Press (**Save**) to save the information.

Related links:

Power-down Function on page 311
Fitting a link that restarts the RFU automatically on page 316

Calling

This section describes how to make the various types of calls from the transceiver. You can make a call to a contact, return or repeat a call from the Call History, or enter information at the time of the call.

For selective calling in ALE/CALM and Selcall HF networks, a control point must register a self address from the list of available addresses for that HF network. Self addresses are included in the HF network information in either the **Selcall|ALE Self Address** or **Additional Self Addresses** entries. If you select an HF network for a call that does not have a registered self address for the control point, you will be prompted to register one of the available self addresses. If you decline to register at this prompt, you can register a self address in **General** > **Register Self Address** (available in advanced view if the HF network has two or more self addresses).

CAUTION: Your control point should have a registered self address for each HF network in which you want to receive non-data calls. If a 3031 Crosspatch is connected as a peripheral device to the GP port connector and you want to be able to receive calls that are specifically addressed to the crosspatch, its self address must be entered in the **Settings** > **Connectors** > **RFU GP Port** > **RFU GP Port Startup** entry, for example **selfid 3031**

NOTE: Depending on the setup of the HF network used for the call and the digital voice and/or encryption options installed in the transceiver, the transceiver may switch automatically between analogue/digital voice and/or clear/secure signals.

Related links:

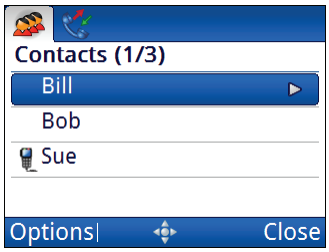
Overview of HF networks on page 194
Registering a self address on page 494
RFU GP Port Startup on page 243
Making a call to a contact on page 48
Making a call from the Call History on page 50
Making a call from the Emergency key on page 51
General calling on page 52
Making a call when multiple control points are connected to the same RFU on page 53
Receiving a call on page 79
Viewing missed calls on page 80
Secure state on page 201
Using digital voice on page 90

Making a call to a contact

NOTE: The default behaviour for the **CALL** key is to press it to start a call, or *hold* **CALL** to see your Contacts/Call History.

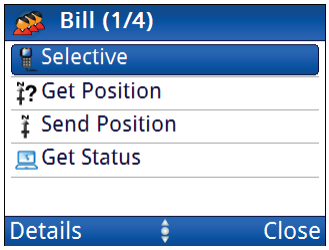
To make a call to a contact:

- *Hold* **CALL**.
- Press ▲ or ▼ to scroll to the contact who you want to call.



If there is more than one call available for the contact, ▶ is shown to the right of the contact name when it is highlighted. If there is only one call for the contact, the icon for this call is shown to the left of the contact name.

- If multiple calls are available, press **CALL** or ▶.



- Press ▲ or ▼ to scroll to the call that you want to make.

  The call types that are available for the contact are set up in **User Data** > **Contacts**.

  NOTE: If only one call has been set up for the contact, you cannot change this at the time of the call.

- Press **CALL**.

  NOTE: Depending upon the call type and other information stored with the contact, you may be prompted to select information during the call. Press **CALL** to progress through these prompts.

- If prompted, press ▲ or ▼ to scroll to the channel that you want to use, then press **CALL**.

  A ✓ is shown next to the currently selected channel/mode.

  To abort the call before it is answered, press PTT or **SCAN**.

  There will be audible beeps or a pop-up message to indicate that the call has been successful.

  NOTE: If **Settings** > **Calling** > **General** > **LBT Mode** is set to **Enabled** or **Override allowed**, you may be asked to make the call again if the channel is occupied.

Related links:

Adding a contact on page 219
LBT Mode on page 345

Making a call from the Call History

The Envoy transceiver stores information for up to 200 calls that have been sent and received for a control point. Each control point may store this call information for up to 20 RFUs to which it has been connected. The detailed Call History is accessed by *holding* **CALL**, then pressing ▶ to scroll to the **Call History** tab.

NOTE: The default behaviour for the **CALL** key is to press it to start a call, or *hold* **CALL** to see your Contacts/Call History.

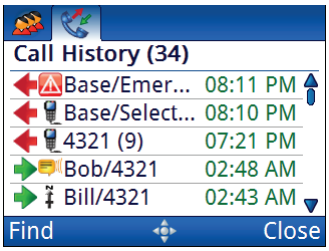
NOTE: A filtered Call Log is available in the call screen. This log contains only the latest instance of a call to and from a specific station, and provides records of up to 20 calls.

NOTE: Missed calls are indicated by an exclamation mark in a yellow triangle in front of the call icon.

To make a call from the Call History:

- *Hold* **CALL**.
- Press ◀ or ▶ to select the **Call History** tab.

  The unfiltered history of the last 200 calls is shown.



  NOTE: If you want to view two lines of information for each call as you scroll through the Call History, switch to advanced view (+ **2**).

- If you want to filter the Call History by incoming calls, outgoing calls, or missed calls, press **#** repeatedly until the log that you want to view is shown (2220/2230 only).
- Press ▲ or ▼ to scroll to the call that you want to return or repeat.

  NOTE: You can also press (**Find**), enter appropriate characters, then highlight the call that you want to return or repeat.

- If you want to view the details of the call, press (**Options**), scroll to **Details**, then press (**Select**).

  Press (**Close**) to exit from the call details.
- Press ◀ or ▶ to select the call type that you want to use.
- Continue from making your chosen call type.

Related links:

Call History on page 593
Call Key Options on page 310
Viewing missed calls on page 80
Switching between basic and advanced views on page 144
Making a Selective call on page 55
Making a Channel Test call on page 56
Making a Message call on page 60
Making a Phone call on page 63
Making a Send Position call on page 64
Making a Get Position call on page 66
Making a Get Status call on page 67
Making an Emergency call on page 69
Making an RFDS Emergency call on page 71
Making a Marine Emergency call on page 72
Making an ALE Sounding call on page 73
Making an SMS call on page 74
Making a Web Message call on page 76

Making a call from the Emergency key

You can set up an emergency contact with calls that are chained together when you *hold* the ⚠ key. Emergency contacts are set up in **User Data** > **Contacts** > **Emergency Contacts**.

CAUTION: If you have more than one emergency contact, you will be prompted to select the emergency contact who you want to call at the time of the call.

To make a call from the Emergency key:

- *Hold* ⚠ for 2 sec.
- If you have more than one emergency contact, scroll to the contact who you want to call, then press **CALL**.

- If prompted, press ▲ or ▼ to scroll to the channel that you want to use, then press **CALL**.

  A ✓ is shown next to the currently selected channel/mode.

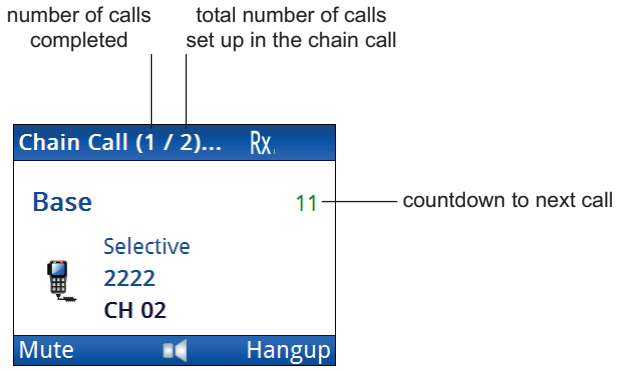
  To abort the call before it is answered, press PTT or **SCAN**.

  There will be audible beeps or a pop-up message to indicate that the call has been successful.

  NOTE: Calls made from the ⚠ key always override LBT mode if it is enabled.

  NOTE: If there are several calls programmed for this emergency contact, the transceiver proceeds with the next call following a pre-defined pause.

Figure 15: Chain call

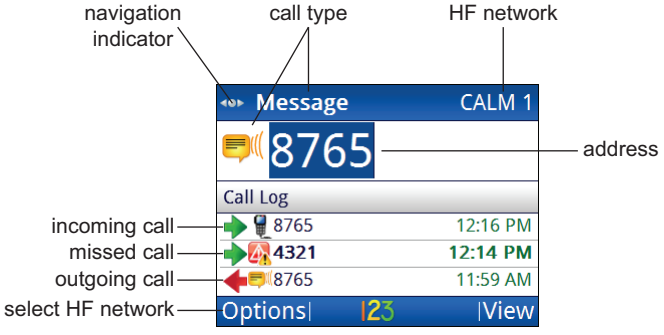


Related links:

Overview of contacts on page 214
Adding a contact on page 219
Chain call on page 215
LBT Mode on page 345

General calling

Figure 16: Call screen with Call Log



Related links:

Making a call when multiple control points are connected to the same RFU on page 53
Listening before transmitting on page 54
Making a Selective call on page 55
Making a Channel Test call on page 56
Making a Message call on page 60
Making a Phone call on page 63
Making a Send Position call on page 64
Making a Get Position call on page 66
Making a Get Status call on page 67
Making an Emergency call on page 69
Making an RFDS Emergency call on page 71
Making a Marine Emergency call on page 72
Making an ALE Sounding call on page 73
Making an SMS call on page 74
Making a Web Message call on page 76

Making a call when multiple control points are connected to the same RFU

When multiple control points are connected to the same RFU and a call is made, certain activities may be excluded if the control point does not have control of the call. If two or more control points have the same self address registered for use in the HF network, and one of these stations makes a call, then any control points with the same self address also have control of the outgoing call. PTT is on a first-come, first-served basis, and all other control points are not able to PTT while the RFU is in the transmit state. Control points that have a different self address registered may be able override calling and system locks.

Control points that have control of a call show the same calling information. Control points that do not have control of the call show a **System busy** pop-up if an attempt to interrupt or join the call is made. You may have to switch off mute and change the mute type to be able to hear the conversation.

Figure 17: Calling information when multiple control points are connected

You may be able to override this lock, depending on the value set in **Settings** > **Calling** > **General** > **Calling Lock Override**.

The TPS System Programmer has a **Default Calling Lock Override** entry that enables you to set this initial state for all control points in a multiple control point system. The value in the **Calling Lock Override** entry at the local control point overwrites the value set in the control point by the **Default Calling Lock Override** entry.

To override a call lock, if permitted:

- Press **CALL**, **SCAN**, **PTT**, or attempt to change the channel or mode, then confirm any prompts to abort the call or to override a system lock.

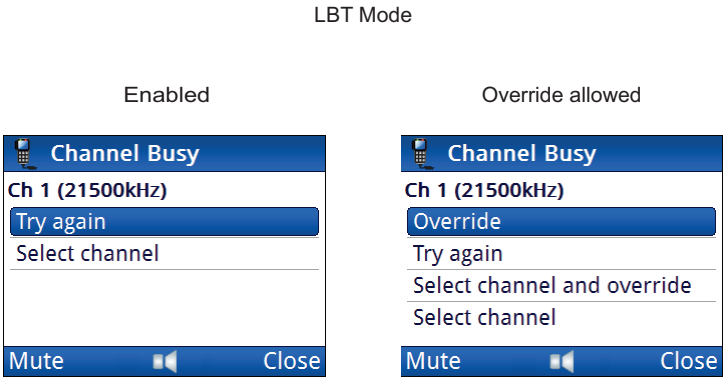
Related links:

Calling Lock Override on page 349
The channel screen on page 27

Listening before transmitting

Your transceiver can be set to listen on a channel for traffic before it starts transmitting. If **Settings** > **Calling** > **General** > **LBT Mode** is set to **Enabled** or **Override allowed**, and a channel is found to be occupied during a call, you are prompted on how you want to proceed with the call.

Figure 18: Options for LBT



To continue with the call if a channel is occupied with voice or data traffic:

- Do *one* of the following:
  - If you want to make the call again using LBT, select **Try again**.
  - If you want to make the call on a different channel using LBT, select **Select channel**.
  - If you want to make the call again without LBT, select **Override**.
  - If you want to make the call on a different channel without LBT, select **Select channel and override**.

NOTE: Detected ALE transmissions are not overridden in accordance with the MIL-STD-188-141B ALE standard.

Related links:

LBT Mode on page 345

Making a Selective call

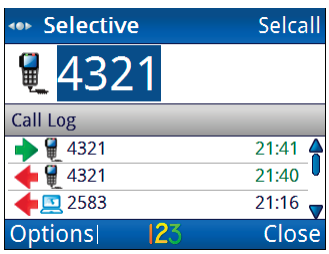
If you want to speak with the operator at a particular station, make a Selective call to the address of that station. When the station receives the call, the transceiver sounds an alert tone to notify the operator.

To make a Selective call:

- Press **CALL**.

NOTE: You may be prompted to register a self address on this control point for the HF network that you are using to make the call.

The call type and address of the last call are shown at the top of the call screen. The filtered Call Log below this shows the latest instance of any call type made to or received from a particular address.



- If you do not want to use the HF network shown at the top right of the screen:
  - Press (**Options**).
  - Scroll to **HF Networks**, then press (**Select**).
  - Scroll to the HF network that you want to use, then press **OK**.

- Press ◀ or ▶ to select the Selective call type if it is not selected.

  NOTE: If you want to test the quality of the channel before you make the actual call, *hold* **CALL** first.

- Do *one* of the following:

  - To repeat the call to the last address used, press **CALL**.
  - To call a different station, enter the address, then press **CALL**.
  - To repeat or return a call from the Call Log, press ▼ to scroll to the call, press ◀ or ▶ to select your required call type, then press **CALL**.
  - To use an ALE address syntax in an ALE/CALM HF network, press (**View**), scroll to **ALE**, press (**Select**), scroll to the syntax that you want to use, then press **CALL**.

- If prompted, press ▲ or ▼ to scroll to the channel that you want to use, then press **CALL**.

  A ✓ is shown next to the currently selected channel/mode.

  To abort the call before it is answered, press PTT or **SCAN**.

  There will be audible beeps or a pop-up message to indicate that the call has been successful.

  NOTE: If **Settings** > **Calling** > **General** > **LBT Mode** is set to **Enabled** or **Override allowed**, you may be asked to make the call again if the channel is occupied.

Related links:

Selective call on page 581
Registering a self address on page 494
Entering text in a field on page 152
Using multiple addresses for calls in an ALE/CALM HF network on page 597
LBT Mode on page 345
Group calls in a Codan Selcall HF network on page 596

Making a Channel Test call

A Channel Test call enables you to test the quality of a channel/mode in a Codan Selcall HF network, and is sometimes referred to as a Beacon call. If you have the MIL-STD-188-141B ALE option installed, a Channel Test call may be made in an ALE/CALM HF network to replace information in the LQA database, and to perform a manual sounding operation.

There are two ways to test the quality of a channel/mode in a Codan Selcall HF network. You can test the channel before you make the call, or you can start to make the call and then test the channel prior to connecting.

Making a Channel Test call in a Selcall HF network

If you want to test the suitability of a channel/mode before you use it to transmit voice or data, make a Channel Test call to a specific station. The quality is determined by the strength and clarity of a revertive signal.

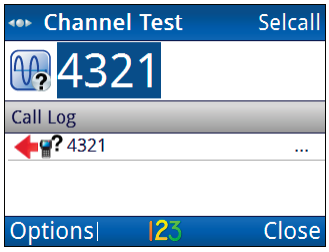
NOTE: If you set up one of the status areas to show the Rx level, you can view the strength of the revertive signal.

To make a Channel Test call in a Selcall HF network:

- Press **CALL**.

  NOTE: You may be prompted to register a self address on this control point for the HF network that you are using to make the call.

  The call type and address of the last call are shown at the top of the call screen. The filtered Call Log below this shows the latest instance of any call type made to or received from a particular address.



- If you do not want to use the HF network shown at the top right of the screen:
  - Press (**Options**).
  - Scroll to **HF Networks**, then press (**Select**).
  - Scroll to the HF network that you want to use, then press **OK**.
- Press ◀ or ▶ to select the Channel Test call type if it is not selected.
- Do *one* of the following:
  - To repeat the call to the last address used, press **CALL**.
  - To call a different station, enter the address, then press **CALL**.
  - To repeat or return a call from the Call Log, press ▼ to scroll to the call, press ◀ or ▶ to select your required call type, then press **CALL**.
- If prompted, press ▲ or ▼ to scroll to the channel that you want to test, then press **CALL**.

  A ✓ is shown next to the currently selected channel/mode.
- Listen for the revertive signal from the other station.

  The volume and clarity of the signal indicates the quality of the channel/mode.

Related links:

Channel Test call on page 575
Registering a self address on page 494
Entering text in a field on page 152
Selecting information to be shown in a status area on page 31

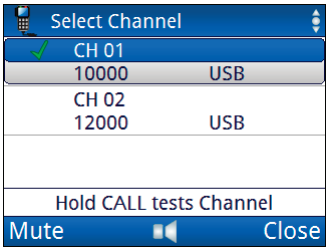
Making a Channel Test call as part of a call in a Selcall HF network

If you want to test the suitability of a channel/mode for transmitting voice or data during a call, you can make a Channel Test call within the call that you are making.

NOTE: If you set up one of the status areas to show the Rx level, you can view the strength of the revertive signal.

To test a channel as part of a call in a Selcall HF network:

- Start the call that you want to make to the other station.
- When you are prompted to select a channel for the call, scroll to the channel that you want to use.



- *Hold* **CALL** to perform the Channel Test call.
- Listen for the revertive signal from the other station.

  The volume and clarity of the signal indicates the quality of the channel/mode.
- Do *one* of the following:
  - If the channel is suitable, press **CALL**.
  - If you want to test another channel, scroll to the channel, then *hold* **CALL**.

Related links:

Channel Test call on page 575
Registering a self address on page 494
Entering text in a field on page 152
Selecting information to be shown in a status area on page 31

Making a Channel Test call in an ALE/CALM HF network

NOTE: A Channel Test call in an ALE/CALM HF network is available if the MIL-STD-188-141B ALE option is installed.

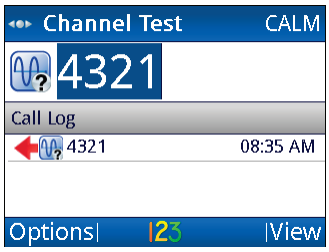
If you want to update the information stored in the LQA database for the called address using the same HF network for the current time slot, make a Channel Test call to this station. The calling station sends a beacon on each channel in the scan tables associated with the HF network. Local and remote BER and SINAD information is recorded, and an LQA score is determined for each channel.

To make a Channel Test call in an ALE/CALM HF network:

- Press **CALL**.

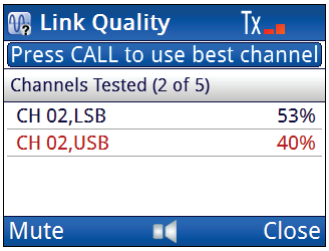
  NOTE: You may be prompted to register a self address on this control point for the HF network that you are using to make the call.

  The call type and address of the last call are shown at the top of the call screen. The filtered Call Log below this shows the latest instance of any call type made to or received from a particular address.



- If you do not want to use the HF network shown at the top right of the screen:
  - Press (**Options**).
  - Scroll to **HF Networks**, then press (**Select**).
  - Scroll to the HF network that you want to use, then press **OK**.
- Press ◀ or ▶ to select the Channel Test call type if it is not selected.
- Do *one* of the following:
  - To repeat the call to the last address used, press **CALL**.
  - To call a different station, enter the address, then press **CALL**.
  - To repeat or return a call from the Call Log, press ▼ to scroll to the call, press ◀ or ▶ to select your required call type, then press **CALL**.

  The LQA score for each channel is shown.



NOTE: If you switch to advanced view (+ **2**), BER/SINAD information is displayed in the LQA screen.

NOTE: If the channel information is shown in red, the channel has an LQA score that is less than the value set in **Settings** > **Calling** > **ALE** > **ALE Call Threshold**.

- Do *one* of the following:
  - Press **CALL** to start a call to this station using the best channel.
  - Press ▲ or ▼ to scroll to the channel that you want to use, then press **CALL**.
  - Press (**Close**) to exit the LQA screen.
- If you are continuing with a call, press ◀ or ▶ to select your required call type, then press **CALL**.

Related links:

Channel Test call on page 575
Registering a self address on page 494
Using multiple addresses for calls in an ALE/CALM HF network on page 597
Group Selective call on page 587
NET call on page 588
Entering text in a field on page 152
Switching between basic and advanced views on page 144
ALE Call Threshold on page 358

Making a Message call

If you want to send a text message to another station, make a Message call.

You can:

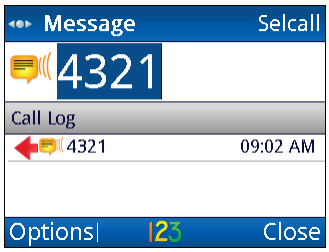
- enter a message at the time that you make a call
- store up to 10 messages in **User Data** > **Messages** for later use
- store messages in a contact as part of a pre-programmed Message call

To make a Message call:

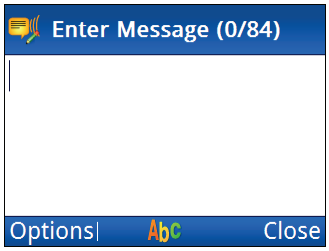
- Press **CALL**.

NOTE: You may be prompted to register a self address on this control point for the HF network that you are using to make the call.

The call type and address of the last call are shown at the top of the call screen. The filtered Call Log below this shows the latest instance of any call type made to or received from a particular address.



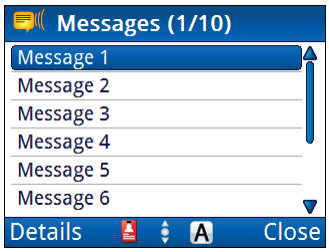
- If you do not want to use the HF network shown at the top right of the screen:
  - Press (**Options**).
  - Scroll to **HF Networks**, then press (**Select**).
  - Scroll to the HF network that you want to use, then press **OK**.
- Press ◀ or ▶ to select the Message call type if it is not selected.
- Do *one* of the following:
  - To repeat the call to the last address used, press **CALL**.
  - To call a different station, enter the address, then press **CALL**.
  - To repeat or return a call from the Call Log, press ▼ to scroll to the call, press ◀ or ▶ to select your required call type, then press **CALL**.
  - To use an ALE address syntax in an ALE/CALM HF network, press (**View**), scroll to **ALE**, press (**Select**), scroll to the syntax that you want to use, then press **CALL**.



- If you want to enter a message:
  - *Hold* # to select a different input language, if required.
  - Start typing the message.

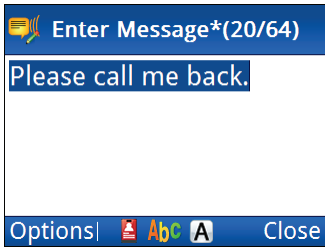
    NOTE: Press **OK** to start a new line, if required.
  - Press (**Options**), scroll to **Call**, then press (**Select**) to add the message to the call.

- If you want to select a message from a list of stored messages:
  - Press (**Options**), scroll to **Stored**, then press (**Select**).



  - Press ▲ or ▼ to scroll to the message that you want to use.

    NOTE: If you want to view the message, press (**Details**) to view the message, then press (**Close**).
  - Press **OK** to select the message.
  - Edit the message, if required.



  - Press (**Options**), scroll to **Call**, then press (**Select**).
- If you have a GPS receiver connected, or your My Position setting is programmed, and you want to insert your current GPS position into the message:
  - Press (**Options**), scroll to **Insert GPS**, then press (**Select**).

    NOTE: This menu option is only available providing there is space for twenty (20) characters in the message.

    NOTE: You can insert the GPS position in the middle of the typed message.
- If prompted, press ▲ or ▼ to scroll to the channel that you want to use, then press **CALL**.

  A ✓ is shown next to the currently selected channel/mode.

  To abort the call before it is answered, press PTT or **SCAN**.

  There will be audible beeps or a pop-up message to indicate that the call has been successful.

  NOTE: If **Settings** > **Calling** > **General** > **LBT Mode** is set to **Enabled** or **Override allowed**, you may be asked to make the call again if the channel is occupied.

Related links:

Message call on page 579
Registering a self address on page 494
Entering text in a field on page 152
Entering text with the 2221 Handset on page 155
Using multiple addresses for calls in an ALE/CALM HF network on page 597
Making a call to a contact on page 48
LBT Mode on page 345
Group calls in a Codan Selcall HF network on page 596

Making a Phone call

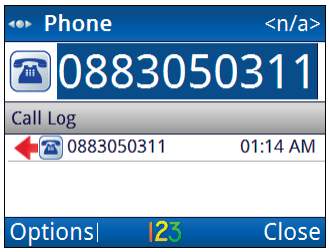
If you want to speak with an operator on a phone line, make a Phone call to that number. The transceiver makes an HF call to a telephone station (the phone link). A telephone station comprises a Codan HF transceiver that is connected to a radio/telephone interconnect unit. The interconnect unit is connected to the public telephone network.

To make a Phone call:

- Press **CALL**.

  NOTE: You may be prompted to register a self address on this control point for the HF network that you are using to make the call.

  The call type and address of the last call are shown at the top of the call screen. The filtered Call Log below this shows the latest instance of any call type made to or received from a particular address.



- Press ◀ or ▶ to select the Phone call type if it is not selected.
- Do *one* of the following:
  - Enter the phone number that you want to call, then press **CALL**.
  - To repeat or return a call from the Call Log, press ▼ to scroll to the call, press ◀ or ▶ to select your required call type, then press **CALL**.

- If you are prompted to add a phone link, do the following:
  - Enter the name that you want to use for the phone link.
  - Press ▼ to move to the **HF Network** entry.
  - Press ◀ or ▶ to select the HF network that you want to use.
  - Press ▼ to move to the **Address** | **Selcall Address** | **ALE Address** entry.
  - Enter the address of the telephone station.
  - Press (**Save**).
- If you are prompted to select a phone link, scroll to the phone link that you want to use, then press **CALL**.
- If prompted, press ▲ or ▼ to scroll to the channel that you want to use, then press **CALL**.

  A ✓ is shown next to the currently selected channel/mode.

  To abort the call before it is answered, press PTT or **SCAN**.

  There will be audible beeps or a pop-up message to indicate that the call has been successful.

  NOTE: If **Settings** > **Calling** > **General** > **LBT Mode** is set to **Enabled** or **Override allowed**, you may be asked to make the call again if the channel is occupied.
- Press **SCAN**, then press (**Hangup**) to end the call.

Related links:

Phone call on page 580
Registering a self address on page 494
Entering text in a field on page 152
Using multiple addresses for calls in an ALE/CALM HF network on page 597
LBT Mode on page 345
Group calls in a Codan Selcall HF network on page 596

Making a Send Position call

If you want to send your GPS information to another station, make a Send Position call.

NOTE: You can make a Send Position call if the GPS Call option is installed, and your GPS information is valid. The transceiver sends GPS information if you have a GPS receiver connected and selected as a peripheral device, or from valid content in **Settings** > **GPS** > **My Position**.

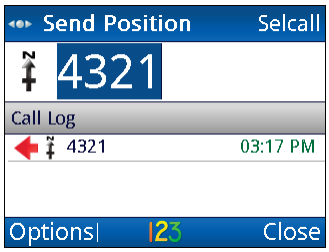
NOTE: When GPS information is sent via a Selcall HF network, the altitude is shown as --.

To make a Send Position call:

- Press **CALL**.

  NOTE: You may be prompted to register a self address on this control point for the HF network that you are using to make the call.

  The call type and address of the last call are shown at the top of the call screen. The filtered Call Log below this shows the latest instance of any call type made to or received from a particular address.



- If you do not want to use the HF network shown at the top right of the screen:
  - Press (**Options**).
  - Scroll to **HF Networks**, then press (**Select**).
  - Scroll to the HF network that you want to use, then press **OK**.
- Press ◀ or ▶ to select the Send Position call type if it is not selected.
- Do *one* of the following:
  - To repeat the call to the last address used, press **CALL**.
  - To call a different station, enter the address, then press **CALL**.
  - To repeat or return a call from the Call Log, press ▼ to scroll to the call, press ◀ or ▶ to select your required call type, then press **CALL**.
  - To use an ALE address syntax in an ALE/CALM HF network, press (**View**), scroll to **ALE**, press (**Select**), scroll to the syntax that you want to use, then press **CALL**.
- If prompted, press ▲ or ▼ to scroll to the channel that you want to use, then press **CALL**.

  A ✓ is shown next to the currently selected channel/mode.

  To abort the call before it is answered, press PTT or **SCAN**.

  There will be audible beeps or a pop-up message to indicate that the call has been successful.

  NOTE: If **Settings** > **Calling** > **General** > **LBT Mode** is set to **Enabled** or **Override allowed**, you may be asked to make the call again if the channel is occupied.

Related links:

Send Position call on page 582
Registering a self address on page 494
Entering text in a field on page 152
My Position on page 366
Using multiple addresses for calls in an ALE/CALM HF network on page 597
Selecting a peripheral device on page 238
LBT Mode on page 345
Group calls in a Codan Selcall HF network on page 596

Making a Get Position call

If you want to obtain the GPS position of a specific station that has valid GPS information, make a Get Position call to that station. Get Position calls are automatically answered by the receiving station so an operator is not required to process the return call.

NOTE: You can make a Get Position call if the GPS Call option is installed in your transceiver and the transceiver that you are calling. The success of your Get Position call depends upon the value set in **Calling** > **General** > **Respond GPS** of the transceiver you are calling and the privacy mode of the HF network that you are using for the call.

NOTE: When GPS information is sent via a Selcall HF network, the altitude is shown as --.

To make a Get Position call:

- Press **CALL**.

  NOTE: You may be prompted to register a self address on this control point for the HF network that you are using to make the call.

  The call type and address of the last call are shown at the top of the call screen. The filtered Call Log below this shows the latest instance of any call type made to or received from a particular address.

- If you do not want to use the HF network shown at the top right of the screen:
  - Press (**Options**).
  - Scroll to **HF Networks**, then press (**Select**).
  - Scroll to the HF network that you want to use, then press **OK**.

- Press ◀ or ▶ to select the Get Position call type if it is not selected.
- Do *one* of the following:
  - To repeat the call to the last address used, press **CALL**.
  - To call a different station, enter the address, then press **CALL**.
  - To repeat or return a call from the Call Log, press ▼ to scroll to the call, press ◀ or ▶ to select your required call type, then press **CALL**.
- If prompted, press ▲ or ▼ to scroll to the channel that you want to use, then press **CALL**.

  A ✓ is shown next to the currently selected channel/mode.

  To abort the call before it is answered, press PTT or **SCAN**.

  There will be audible beeps or a pop-up message to indicate that the call has been successful.

  NOTE: If **Settings** > **Calling** > **General** > **LBT Mode** is set to **Enabled** or **Override allowed**, you may be asked to make the call again if the channel is occupied.

NOTE: The format of GPS information in a call pop-up is set in **Settings** > **GPS** > **GPS Format Options**.

Related links:

Get Position call on page 577
Registering a self address on page 494
Entering text in a field on page 152
Respond GPS on page 347
Privacy mode on page 200
GPS Show Options on page 365
LBT Mode on page 345
GPS Format Options on page 366

Making a Get Status call

If you want to obtain information on the status of a transceiver at a specific station, such as the power output of the transmitter or the firmware versions installed, make a Get Status call to that station. Get Status calls are automatically answered by the receiving station so an operator is not required to process the return call.

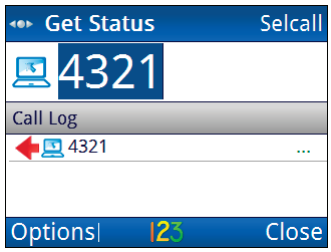
NOTE: The success of your Get Status call depends upon the value set in **Calling** > **General** > **Respond OTA** of the transceiver you are calling and the privacy mode of the HF network that you are using for the call.

To make a Get Status call:

- Press **CALL**.

NOTE: You may be prompted to register a self address on this control point for the HF network that you are using to make the call.

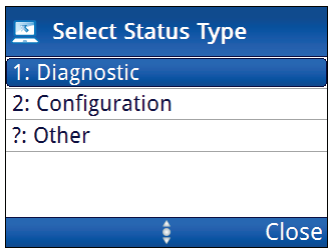
The call type and address of the last call are shown at the top of the call screen. The filtered Call Log below this shows the latest instance of any call type made to or received from a particular address.



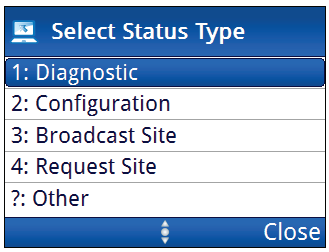
- If you do not want to use the HF network shown at the top right of the screen:
  - Press (**Options**).
  - Scroll to **HF Networks**, then press (**Select**).
  - Scroll to the HF network that you want to use, then press **OK**.
- Press ◀ or ▶ to select the Get Status call type if it is not selected.
- Do *one* of the following:
  - To repeat the call to the last address used, press **CALL**.
  - To call a different station, enter the address, then press **CALL**.
  - To repeat or return a call from the Call Log, press ▼ to scroll to the call, press ◀ or ▶ to select your required call type, then press **CALL**.

Figure 19: Available status types for a Get Status call in a Selcall or an ALE/CALM HF network

Selcall HF network



ALE/CALM HF network
MIL-STD-188-141B ALE option
ALE Site Manager:
Auto
Manual
Restricted



NOTE: If you leave the address empty, the transceiver prompts if you want to send a Broadcast Site call, if permitted. If you confirm that you want to send a Broadcast Site call, you are not asked to select the status type.

- Press ▲ or ▼ to scroll to the status type that you want to use, then press **OK**.
- If you selected **?: Other** as the status type, enter the text/command that you want to send, press ⌐ (**Options**), scroll to **OK**, then press ⌐ (**Select**).

  NOTE: For information on over-the-air commands, please contact your Codan representative.
- If prompted, press ▲ or ▼ to scroll to the channel that you want to use, then press **CALL**.

  A ✓ is shown next to the currently selected channel/mode.

  To abort the call before it is answered, press PTT or **SCAN**.

  There will be audible beeps or a pop-up message to indicate that the call has been successful.

  NOTE: If **Settings** > **Calling** > **General** > **LBT Mode** is set to **Enabled** or **Override allowed**, you may be asked to make the call again if the channel is occupied.

Related links:

Get Status call on page 578
Registering a self address on page 494
ALE Site Manager on page 353
MIL-STD-188-141B ALE on page 197
Entering text in a field on page 152
Respond OTA on page 348
LBT Mode on page 345

Making an Emergency call

If you want to trigger an emergency alert tone at a particular station and speak with an operator, make an Emergency call. If the GPS Call option is installed in the transceiver (and you have a GPS receiver connected and selected as a peripheral device, or GPS information stored in **Settings** > **GPS** > **My Position**), your GPS position is automatically sent with the call. Emergency calls can be sent to several stations at once.

NOTE: When GPS information is sent via a Selcall HF network, the altitude is shown as --.

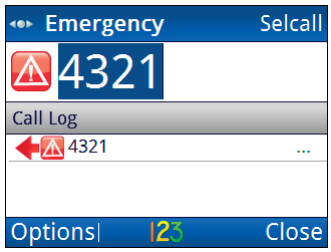
If you have the FED-STD-1045 ALE/CALM option installed, you can use the global ALL address syntax (@?@) with the Emergency call type to send a call to all stations using an ALE/CALM HF network and common channels. If you have the MIL-STD-188-141B ALE option installed, you can use the ALL, ANY, Group Selective, NET, or Wildcard address syntax with the Emergency call type to send a call to a group of stations using an ALE/CALM HF network.

To make an Emergency call:

- Press **CALL**.

NOTE: You may be prompted to register a self address on this control point for the HF network that you are using to make the call.

The call type and address of the last call are shown at the top of the call screen. The filtered Call Log below this shows the latest instance of any call type made to or received from a particular address.



- ❑ If you do not want to use the HF network shown at the top right of the screen:
  - Press (**Options**).
  - Scroll to **HF Networks**, then press (**Select**).
  - Scroll to the HF network that you want to use, then press **OK**.
- ❑ Press ◀ or ▶ to select the Emergency call type if it is not selected.
- ❑ Do *one* of the following:
  - To repeat the call to the last address used, press **CALL**.
  - To call a different station, enter the address, then press **CALL**.
  - To repeat or return a call from the Call Log, press ▼ to scroll to the call, press ◀ or ▶ to select your required call type, then press **CALL**.
  - To use an ALE address syntax in an ALE/CALM HF network, press (**View**), scroll to **ALE**, press (**Select**), scroll to the syntax that you want to use, then press **CALL**.
- ❑ If prompted, press ▲ or ▼ to scroll to the channel that you want to use, then press **CALL**.

  A ✓ is shown next to the currently selected channel/mode.

  To abort the call before it is answered, press PTT or **SCAN**.

  There will be audible beeps or a pop-up message to indicate that the call has been successful.

  NOTE: Emergency calls always override LBT mode if it is enabled.

Related links:

Emergency call on page 576
Registering a self address on page 494
Entering text in a field on page 152
Using multiple addresses for calls in an ALE/CALM HF network on page 597
Group calls in a Codan Selcall HF network on page 596
My Position on page 366
Selecting a peripheral device on page 238
Making a call from the Emergency key on page 51
GPS Show Options on page 365

Making an RFDS Emergency call

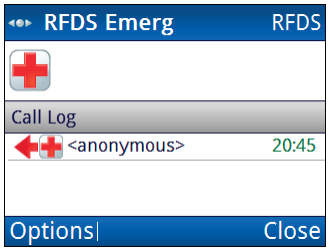
NOTE: The RFDS Emergency call type is available in Australia only, and uses the RFDS call system and specific RFDS channels.

If you want to trigger an emergency alert tone at an RFDS station, make an RFDS Emergency call.

To make an RFDS Emergency call:

- Press **CALL**.

  The call type and address of the last call are shown at the top of the call screen. The filtered Call Log below this shows the latest instance of any call type made to or received from a particular address.



  NOTE: The RFDS Emergency call type is only available if an RFDS HF network is selected.

- If you do not want to use the HF network shown at the top right of the screen:
  - Press (**Options**).
  - Scroll to **HF Networks**, then press (**Select**).
  - Scroll to the HF network that you want to use, then press **OK**.
- Press **CALL**

- If prompted, press ▲ or ▼ to scroll to the channel that you want to use, then press **CALL**.

  A ✓ is shown next to the currently selected channel/mode.

- Wait for an RFDS operator to answer your call.

Related links:

RFDS Emergency call on page 581

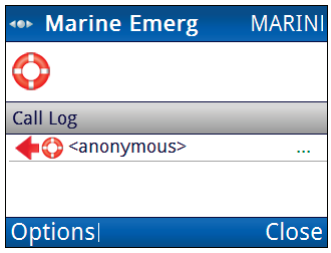
Making a Marine Emergency call

If you want to broadcast an emergency hee-haw alert tone, make a Marine Emergency call.

To make a Marine Emergency call:

- Press **CALL**

  The call type and address of the last call are shown at the top of the call screen. The filtered Call Log below this shows the latest instance of any call type made to or received from a particular address.



NOTE: The Marine Emergency call type is only available if a Marine Tone HF network is selected.

- If you do not want to use the HF network shown at the top right of the screen:
  - Press (**Options**).
  - Scroll to **HF Networks**, then press (**Select**).
  - Scroll to the HF network that you want to use, then press **OK**.
- Press **CALL**
- If prompted, press ▲ or ▼ to scroll to the channel that you want to use, then press **CALL**.

  A ✓ is shown next to the currently selected channel/mode.

- Wait for an operator to answer your call.

Related links:

Marine Emergency call on page 579

Making an ALE Sounding call

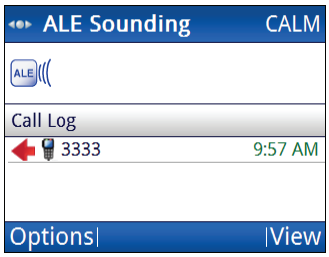
NOTE: The ALE Sounding call type may be used if the MIL-STD-188-141B ALE option is installed.

If you want to update the LQA information stored in other transceivers in your communication network, make an ALE Sounding call. The sounding call is an ALE broadcast call that is made on all channels in the scan tables allocated to the selected HF network. A transceiver that *detects* the sounding call updates the information stored in its LQA database.

To make an ALE Sounding call:

- Press **CALL**.

  The call type and address of the last call are shown at the top of the call screen. The filtered Call Log below this shows the latest instance of any call type made to or received from a particular address.



- If you do not want to use the HF network shown at the top right of the screen:
  - Press (**Options**).
  - Scroll to **HF Networks**, then press (**Select**).
  - Scroll to the HF network that you want to use, then press **OK**.
- Press ◀ or ▶ to select the ALE Sounding call type if it is not selected.
- Do *one* of the following:
  - To repeat the call to the last address used, press **CALL**.
  - To call a different station, enter the address, then press **CALL**.
  - To repeat or return a call from the Call Log, press ▼ to scroll to the call, press ◀ or ▶ to select your required call type, then press **CALL**.
  - To use an ALE address syntax in an ALE/CALM HF network, press (**View**), scroll to **ALE**, press (**Select**), scroll to the syntax that you want to use, then press **CALL**.

Making an SMS call

NOTE: The SMS call type may only be used when **Cell/Sat Modem** is the selected RFU GP Port peripheral device. Refer to *Selecting a peripheral device* on page 238 for further details.

If you want to send an SMS to a mobile phone, make an SMS call.

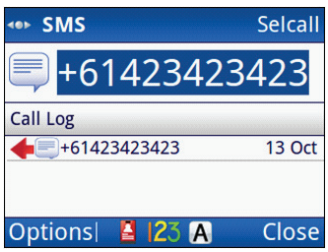
You can:

- enter a message at the time you make a call
- store up to 10 messages in **User Data** > **Messages** for later use
- store messages in a contact as part of a pre-programmed SMS call

To make an SMS call:

- Press **CALL**.

  NOTE: If the HF network you are using to make the call has additional self addresses, you may be prompted to register a self address on this control point. The self address is transmitted with the SMS (over cellular or satellite) to allow the mobile phone user to reply to your message. Either a Selcall or ALE type HF network may be used to make the SMS call. This call type only makes use of the self address from the HF Network and does not use the underlying HF calling protocol.

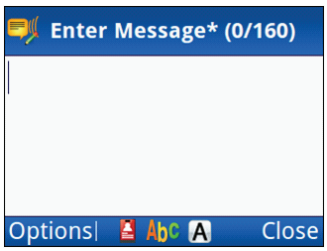


- If you do not want to use the HF network shown at the top right of the screen:
  - Press (**Options**).
  - Scroll to **HF Networks**, then press (**Select**).
  - Scroll to the HF network that you want to use, then press **OK**.
- Press ◀ or ▶ to select the SMS call type if it is not selected.
- Do *one* of the following:
  - To repeat the SMS call to the last phone number used, press **CALL**.
  - To send the SMS to a different mobile phone, enter the phone number, then press **CALL**.
  - To repeat or return a call from the Call Log, press ▼ to scroll to the call, press ◀ or ▶ to select your required call type, then press **CALL**.

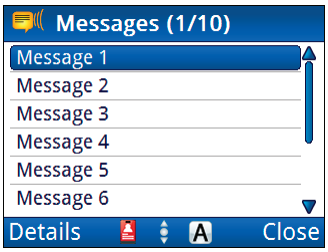
NOTE: When making an SMS call, a country code is mandatory in the destination phone number. E.g. +61 for Australian mobile phones.

- If you want to enter a message:
  - *Hold* **#** to select a different input language, if required.
  - Start typing the message.

    NOTE: Press **OK** to start a new line, if required.
  - Press (**Options**), scroll to **Call**, then press (**Select**) to add the message to the call.

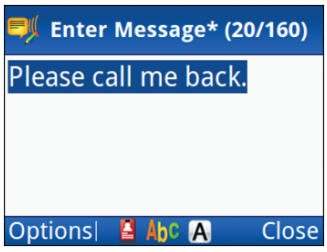


- If you want to select a message from a list of stored messages:
  - Press (**Options**), scroll to **Stored**, then press (**Select**).



  - Press ▲ or ▼ to scroll to the message that you want to use.

    NOTE: If you want to view the message, press (**Details**) to view the message, then press (**Close**).
  - Press **OK** to select the message.
  - Edit the message, if required.



  - Press (**Options**), scroll to **Call**, then press (**Select**).

- At this point the SMS call is sent via the attached cellular/satellite modem, and there will be audible beeps and pop-ups to indicate the progress of the call.

  NOTE: Once an SMS is placed, it may not be aborted by PTT or Scan as the call is short lived and does not utilise normal transceiver resources. You can continue to perform normal transceiver operations (e.g., PTT and speak, toggle scan mode, etc.) while an SMS call is in progress.

Related links:

SMS call on page 582
Using Codan Convoy on page 116
Registering a self address on page 494
Entering text in a field on page 152
Call History on page 593
Making a call to a contact on page 48

Making a Web Message call

NOTE: The Web Message call type may only be used when **Cell/Sat Modem** is the selected RFU GP Port peripheral device. Refer to *Selecting a peripheral device* on page 238 for further details.

If you want to send a message to the Codan Convoy Web Portal, make a Web Message call.

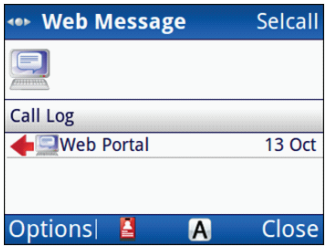
You can:

- enter a message at the time you make a call
- store up to 10 messages in **User Data** > **Messages** for later use
- store messages in a contact as part of a pre-programmed message call

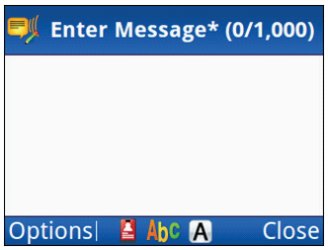
To make a Web Message call:

- Press **CALL**.

  NOTE: If the HF network you are using to make the call has additional self addresses, you may be prompted to register a self address on this control point. The self address is transmitted with the Web Message (over cellular or satellite) to allow the mobile phone user to reply to your message. Either a Selcall or ALE type HF network may be used to make the Web Message call. This call type only makes use of the self address from the HF Network and does not use the underlying HF calling protocol.

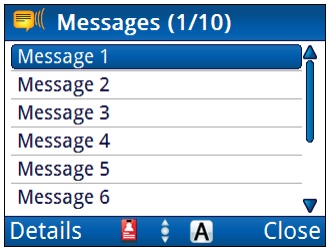


- If you do not want to use the HF network shown at the top right of the screen:
  - Press (**Options**).
  - Scroll to **HF Networks**, then press (**Select**).
  - Scroll to the HF network that you want to use, then press **OK**.
- Press ◄ or ► to select the Web Message call type if it is not selected.
- Do *one* of the following:
  - To perform a new Web Message call, press **CALL**.
  - To repeat or return a call from the Call Log, press ▼ to scroll to the call, press ◄ or ► to select your required call type, then press **CALL**.



- If you want to enter a message:
  - *Hold* # to select a different input language, if required.
  - Start typing the message.

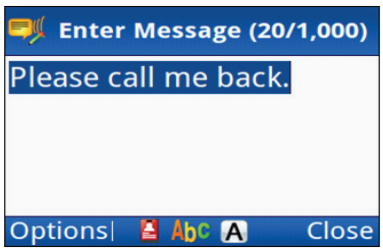
    NOTE: Press **OK** to start a new line, if required.
  - Press (**Options**), scroll to **Call**, then press (**Select**) to add the message to the call.
- If you want to select a message from a list of stored messages:
  - Press (**Options**), scroll to **Stored**, then press (**Select**).



- Press ▲ or ▼ to scroll to the message that you want to use.

  NOTE: If you want to view the message, press (**Details**) to view the message, then press (**Close**).

- Press **OK** to select the message.
- Edit the message, if required.



- Press (**Options**), scroll to **Call**, then press (**Select**).

❑ At this point the Web Message call is sent via the attached cellular/satellite modem, and there will be audible beeps and pop-ups to indicate the progress of the call.

NOTE: Once a Web Message call is placed, it may not be aborted by PTT or Scan as the call is short lived and does not utilise normal transceiver resources. You can continue to perform normal transceiver operations (e.g., PTT and speak, toggle scan mode, etc.) while a Web Message call is in progress.

Related links:

Web Message call on page 583
Using Codan Convoy on page 116
Registering a self address on page 494
Entering text in a field on page 152
Call History on page 593
Making a call to a contact on page 48

Receiving a call

Some calls that are addressed to your station are handled automatically by your transceiver. It will either respond automatically with the information requested in the call that it received (Get Position, Get Status, Channel Test, or ALE Sounding call), or receive the message (Message, Send Position, SMS or Web Message call). The remaining call types (Selective, Phone, and Emergency) sound an alarm at your station.

For incoming ALL, ANY, Group Selective, and Wildcard calls to multiple control points, any control point that has a matching address will receive the call, if permitted. You may have to switch off mute and change the mute type to be able to hear the conversation.

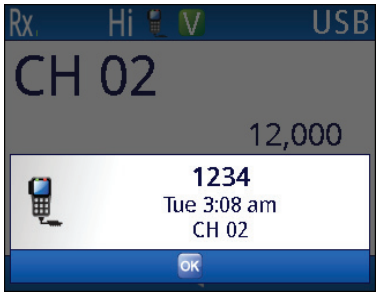
Selective and Phone calls sound an alarm that is similar to a telephone ringing. An Emergency call sounds a hee-haw alarm.

To answer an incoming call:

- Listen for an incoming call tone.

  An incoming call pop-up shows information on the type of call, the address of the caller, the time of the call, and the channel used.

Figure 20: Incoming call pop-up



  After the period set in **Settings** > **Calling** > **General** > **In Call Timeout** has lapsed in the transceiver, the incoming call pop-up changes to the missed call pop-up.

  NOTE: Depending on the setup of the HF network used for the call and the digital voice and/or encryption options installed in the transceiver, the transceiver may switch automatically between analogue/digital voice and/or clear/secure signals.

- If you are receiving a Selective or Emergency call, answer the call by *holding* PTT and speaking side-on across the microphone in the handset, or directly into the microphone on the desk console.
- If you are receiving a Phone call, press PTT to accept the call, then release PTT.

  An automatic voice message is played that asks you to wait while the connection is made. Do not speak during this time.

Related links:

Call types on page 574
Viewing missed calls on page 80
General calling on page 52

Viewing missed calls

If you do not answer a call on your transceiver, a missed call pop-up is shown on the channel screen. The icon for the call type is shown with an exclamation mark. You can scroll through the missed call pop-up to acknowledge the missed calls. If the missed call pop-up is closed without acknowledging a missed call, a missed call icon for the call is shown in the status bar of the channel screen. If the missed call pop-up contains a short message that may be viewed fully in the pop-up, a missed call icon is not shown for this message in the status bar when you close the pop-up.

A list of the possible missed call icons in the status bar is provided in Table 3. The details of any missed call may be viewed in the pop-up, or via the Call History or Call Log.

NOTE: The incoming call pop-up changes to a missed call pop-up when the sending station hangs up the voice-type call, or when the period set in **Settings** > **Calling** > **General** > **In Call Timeout** has lapsed.

Figure 21: Missed call pop-up for a single call

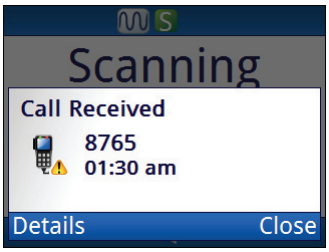


Figure 22: Missed call pop-up for multiple calls

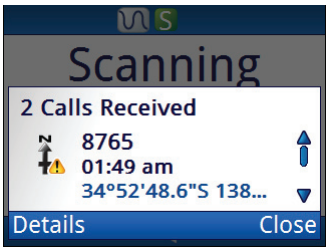
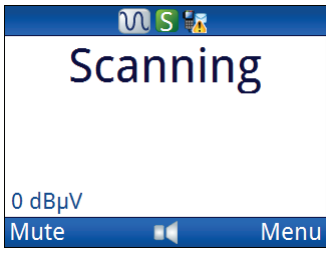


Figure 23: Example of a missed call icon in the status bar of the channel screen



NOTE: Received Get Status and Get Position calls, which do not present an incoming call pop-up, are not tracked as missed calls.

Table 2: Missed call icons that may be shown in the incoming and missed call pop-ups, and Call Log and Call History

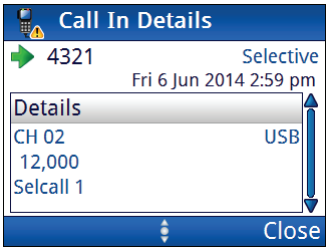
Icon	Description
	Missed Selective call (a missed Selective call retains its missed call icon in the Call Log and Call History when it has been read)
	Missed Phone call (a missed Phone call retains its missed call icon in the Call Log and Call History when it has been read)
	Missed Emergency call (a missed Emergency call retains its missed call icon in the Call Log and Call History when it has been read)
	Missed ALL call (a missed ALL call retains its missed call icon in the Call Log and Call History when it has been read)
	Missed ANY call (a missed ANY call retains its missed call icon in the Call Log and Call History when it has been read)
	Missed Group Selective call (a missed Group Selective call retains its missed call icon in the Call Log and Call History when it has been read)
	Missed Wildcard call (a missed Wildcard call retains its missed call icon in the Call Log and Call History when it has been read)
	Missed Message call (reverts to the Message call icon in the Call Log and Call History when it has been read)
	Missed Send Position call (reverts to the Send Position call icon in the Call Log and Call History when it has been read)
	Missed SMS call (reverts to the SMS call icon in the Call Log and Call History when it has been read)
	Missed Web Message call (reverts to the Web Message call icon in the Call Log and Call History when it has been read)

Table 3: Missed call icons that may be shown in the status bar of the channel screen

Icon	Description
	At least one missed or unread Emergency call exists (takes priority over all other missed calls)
	At least one missed Selective, Phone, ALL, ANY, Group Selective or Wildcard call exists (voice-type call)
	At least one unread Message, Send Position, SMS or Web Message call exists (*received* message-type call)
	At least one missed voice-type call *and* one unread message-type call exists

To view the details of a missed call:

- Do *one* of the following:
  - In the missed call pop-up, press ▲ or ▼ to scroll to the missed call that you want to view.
  - Press **CALL**, then press ▲ or ▼ to scroll to the missed call that you want to view in the Call Log.
  - *Hold* **CALL**, press ▶ to select (**Call History**), press # repeatedly until the Call History is filtered as **Missed Calls**, then press ▲ or ▼ to scroll to the missed call that you want to view.
- Press (**Details**).



- Press ▼ to scroll through the details of the missed call.
- Press (**Close**).
- If you want to return a missed call, scroll to the call, press **CALL**, then continue with the call.

Related links:

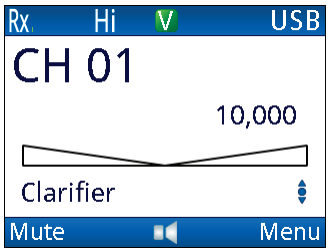
Call History on page 593

Using the clarifier

The clarifier is a feature that enables you to adjust the receive frequency to compensate for any frequency offset between your transceiver and the remote transceiver, thus improving the quality of received voice. Before using the clarifier, you must assign the default **Toggle Clarifier** macro to a hot key.

To use the clarifier:

- Go to the channel screen and ensure that scanning is switched off.
- Do *one* of the following:
  - If you are using a 2220 Handset or 2230 Desk Console, press the hot key to which you have assigned the **Toggle Clarifier** macro.
  - If you are using a 2221 Handset, press (**Menu**), select (**Functions**), scroll to user-defined macro that toggles the clarifier, then press (**OK**).



- Press ▲ or ▼ to increase or decrease the pitch of the received voice, then press **OK**.

If you select a positive clarifier offset from the frequency, the Rx indicator changes to an up arrow. If you select a negative clarifier offset from the frequency, the Rx indicator changes to a down arrow.

When you select another channel/mode the clarifier is reset to the centre point.

Related links:

Creating a macro to perform an action on page 280

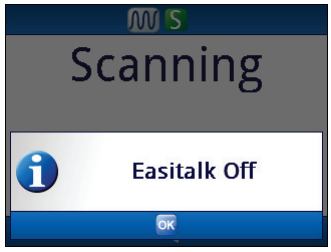
Reducing background noise with *Easitalk*

The *Easitalk* feature enables you to reduce the level of background noise that is present when you listen to a channel.

NOTE: *Easitalk* uses one of three DSP algorithms to reduce the background noise. Depending on the conditions, you may need to change the algorithm in **Settings** > **Configuration** > **General** > **Easitalk Mode**.

To switch *Easitalk* on or off:

- Press EASITALK.



The new status is shown briefly in a pop-up, then you are returned to the screen that you were on previously.

Related links:

Easitalk Mode on page 330

Viewing information about your transceiver

Overview of information in the transceiver

The transceiver contains information on:

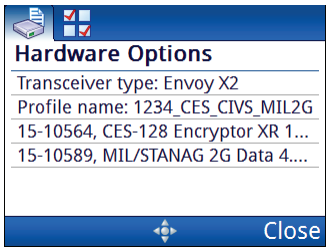
- hardware options that have been fitted
- sales options that have been installed
- the electronic serial number of the RFU
- the version status of the current firmware
- IP information
- licence information

Viewing device information

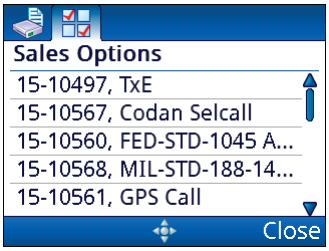
To view information in the transceiver:

- From the main menu, select (**Information**), then (**Device Information**).

  The transceiver type, profile name, and fitted hardware options with respective firmware version are listed.



- If you want to view the sales options that are enabled in the transceiver, press ▶.



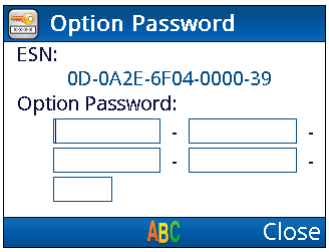
- Press (**Close**).

Viewing the ESN

To view the ESN:

- From the main menu, select (**Information**), then (**Option Password**).

  The ESN is shown on the Option Password screen.



NOTE: If you want to view the ESN of the RFU and the CP, view the Version screen in advanced view (+ **2**).

- Press (**Close**).

Related links:

Viewing the firmware version on page 86

Viewing the firmware version

To view the firmware version of the transceiver:

- From the main menu, select (**Information**), then (**Version**).

NOTE: If you want to view detailed version information and the ESN of the RFU and the control point, switch to advanced view (+ **2**).

NOTE: If you want to view the firmware package version on the channel screen, you can set it to be shown in one of the status areas.

- Press (**Close**).

Related links:

Selecting information to be shown in a status area on page 31

Viewing IP information

The USB interface on the control point supports the RNDIS protocol, which provides a virtual IP connection over USB. The Envoy transceiver connects to the TPS System Programmer, RC50-C HF Email software, Codan Chat, KMS, and KFS via this connection.

To view the IP information:

- From the main menu, select (**Information**), then (**IP Connectivity**).

  You can view the following information for the RFU and control point:

  - IP address
  - MAC address
  - alias
  - network mask
  - DHCP client
  - default gateway

  You can view the following information for the USB interface on the control point:

  - IP address
  - network mask
  - DHCP server

NOTE: If you want to change any of this information, log in to admin level, then go to **Settings** > **Connectivity**.

- Press (**Close**).

Related links:

Logging in to admin level on page 146
Settings > Connectivity on page 377

Viewing licence information

To view licence information:

- From the main menu, select (**Information**), then (**Licence**).

  Licence information is provided for the following components of the firmware:

  - alsa-lib
  - alsa-utils
  - base_libs
  - busy-box
  - dosfstools
  - Droid Font Family
  - DejaVu Font Family
  - iproute
  - iptables
  - libtermcap
  - libusb
  - libXML2
  - lzo
  - Linux Kernel
  - mtd-utils
  - ncurses
  - MELPe
  - Qt Everywhere
  - skell
  - sysconfig
  - u-boot
  - Freescale Semiconductor Embedded Linux 2.6.28
  - GNU Lesser General Public License
  - GNU General Public License Version 2
  - SIL Open Font License Version 1.1

- Press (**Close**).

Related links:

Licence information on page 623

Using digital voice

Related links:

Overview of digital voice options on page 388

Switching the digital voice feature on or off

To switch the digital voice feature on or off:

- If you are using a 2220 Handset or 2230 Desk Console, press SEC.
- If you are using a 2221 Handset:
  - Press (**Options**).
  - Press ▲ or ▼ to scroll to the **Secure On**|**Secure Off** option.
  - Press (**Select**).

  Digital voice is toggled on or off.

Figure 24: Channel screen showing on/off status for a DV option (without encryption)

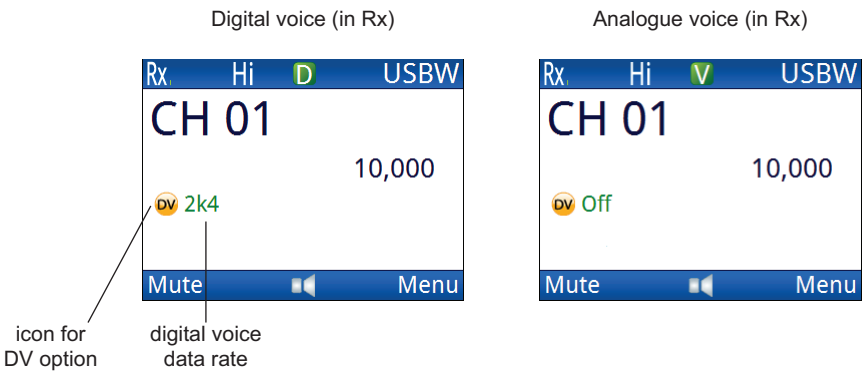
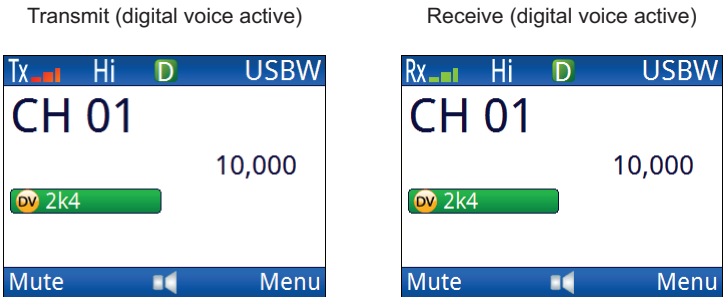


Figure 25: Channel screen showing transmit/receive status for a DV option (without encryption)



CAUTION: If RC50-C is active in a data link and you enable voice mode or press PTT, wait for up to 25 sec before continuing with the digital voice transmission. The receiving station needs this time to regain digital voice synchronisation.

NOTE: When transmitting via a DV option, listen for the Tx ready beep after you have released PTT before you *hold* PTT again.

CAUTION: When transmitting with the AES-256 DV Encryptor, you should *hold* PTT, wait 2 sec, speak, wait 2 sec, then release PTT.

If you have a DV option with the AES-256 Encryption upgrade installed, or you have the AES-256 DV Encryptor installed, the transceiver will also go secure/clear when **SEC** is pressed.

Figure 26: Channel screen showing secure/clear status for all encrypted digital voice

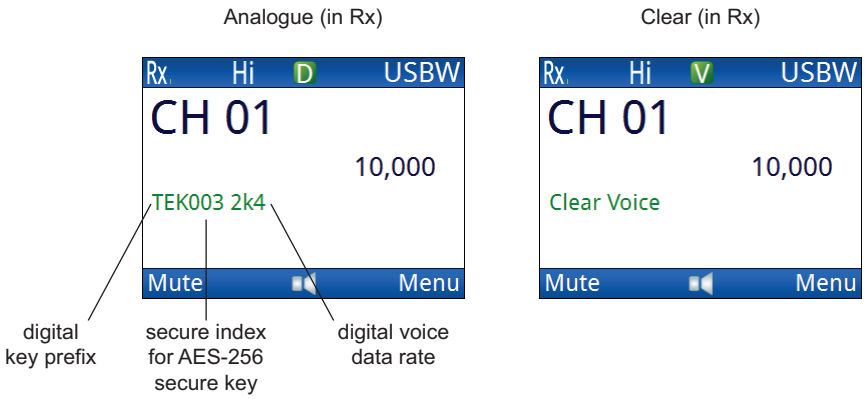
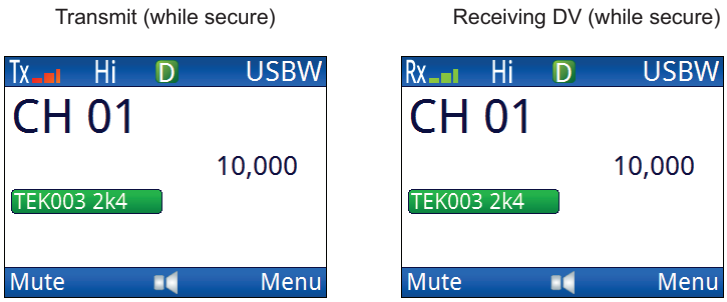


Figure 27: Channel screen showing transmit/receive status for all encrypted digital voice



Selecting the digital voice rate

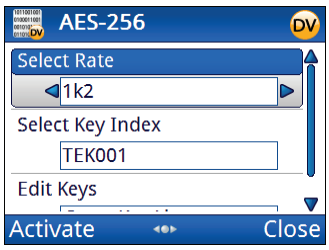
The digital voice rate sets the speed with which digital voice transmissions are sent. The digital voice rate is shown in status area 1 of the screen. Use the lowest digital voice rate in the first instance, then if good HF propagation conditions exist, a higher rate may be selected. The rates from which you can select depend on the vocoder options that you have installed.

NOTE: Receiving DV stations, which have both MELPe and TWELP vocoders available by default, automatically switch to the appropriate rate and vocoder type when a signal is detected.

NOTE: If you change the digital voice rate frequently, you should consider assigning the **Next Digital Voice Rate** macro from **Unassigned** to a hot key.

To select a different digital voice rate:

- If you are using a 2220 Handset or 2230 Desk Console, do *one* of the following:
  - From the main menu,select (**General**), then (**Secure**).
  - *Hold* SEC.
- If you are using a 2221 Handset:
  - From the main menu, select (**Functions**).
  - Press ▲ or ▼ to scroll to the **Secure Info** function.
  - Press (**Select**).



- Press ◀ or ▶ to select the digital voice rate that you want to use.
- Press (**OK**).

Related links:

Digital voice rate on page 389

Selecting digital voice mute

NOTE: Digital voice mute is available when a DV option (with or without the AES-256 Encryption upgrade) or the AES-256 DV Encryptor is active, and scanning is switched off or paused.

NOTE: If you want to suppress any noise burst on a connected or built-in loudspeaker during an operational event (for example, changing a channel or mode) select the **Muted unless digital voice** check box in **Settings** > **Security** > **Digital Voice Options**.

To select digital voice mute:

- Switch off scanning.
- If you are using a 2220 Handset or 2230 Desk Console, press SEC, then press V/S until **D** is shown in the centre of the status bar on the channel screen.
- If you are using a 2221 Handset:
  - Press (**Options**).
  - Press ▲ or ▼ to scroll to the **Secure On** option.
  - Press (**Select**).
  - Press (**Options**).
  - Press ▲ or ▼ to scroll to the **V/S/D** option.
  - Press (**Select**).
  - Repeat these steps until **D** is shown in the centre of the status bar on the channel screen.

DV option without AES-256 Encryption upgrade (in Tx)

All encrypted digital voice (in Tx)

Related links:

Digital voice mute on page 391
Suppressing analogue noise bursts with digital voice on page 398

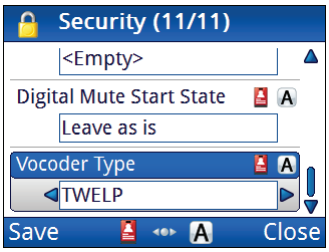
Selecting the vocoder type for transmission

The vocoder is used for transmission of digital voice signals. The vocoder type does not have to be the same across all stations that communicate using a DV option.

NOTE: Receiving DV stations, which have both MELPe and TWELP vocoders available by default, automatically switch to the appropriate rate and vocoder type when a signal is detected.

To select the vocoder type:

- From the main menu,select (**Settings**), then (**Security**).
- Press ▲ or ▼ to scroll to the **Vocoder Type** entry.



- Press ◄ or ► to select the vocoder type that you want to use for digital voice communications.
- Press (**Save**) to save the information.
- Press (**Close**).

Using GPS

Overview of GPS

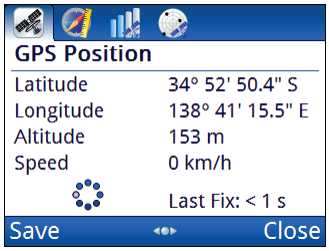
Access to GPS information and sending and receiving GPS information is available if you have the GPS Call option enabled in your transceiver. GPS information may be sourced from a GPS receiver, which is selected as a peripheral device, or from information set up in **Settings** > **GPS** > **My Position**.

GPS information is stored in the Call Log and Call History when it is included with a call, and your own GPS information can be viewed on the series of tabs on the GPS screen. The format of the GPS information is set in **Settings** > **GPS** > **GPS Format Options**.

NOTE: When GPS information is sent via a Selcall HF network, the altitude is shown as --.

The **GPS Position** and **Distance and Bearing** tabs are always available when the GPS Call option is enabled. The **Signal Strength** and **Satellites Constellation** tabs are added when a GPS receiver is connected as a peripheral device.

Figure 28: GPS Position tab



NOTE: Altitude and speed information is hidden by default. This may be changed in **Settings** > **GPS** > **GPS Show Options**.

NOTE: Altitude, speed, and GPS position information may be set to show in the status areas.

Related links:

My Position on page 366
GPS Format Options on page 366
GPS Show Options on page 365
Selecting information to be shown in a status area on page 31

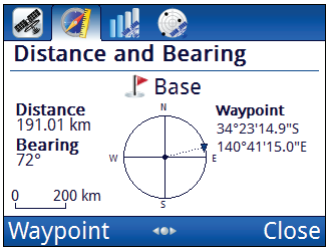
Distance and bearing

The Envoy transceiver calculates distance and bearing information between your GPS position and a waypoint. This information is shown on the **Distance and Bearing** tab. Your GPS information may be from either the last fix from a GPS receiver or information entered into **Settings** > **GPS** > **My Position**.

The waypoint information may be derived from:

- a Get Position call or Send Position call in the Call History
- a Get Position call in Contacts
- a selected waypoint

Figure 29: Distance and Bearing tab



Related links:

My Position on page 366
Updating a waypoint from the Call History on page 97
Updating a waypoint from a contact on page 98
Adding a waypoint on page 100

Waypoints

NOTE: You can set a waypoint if the GPS Call option is installed.

A waypoint is a collection of GPS information for a location. When you select a waypoint, the transceiver automatically calculates the distance and bearing from your current GPS information to the waypoint.

Saving your current GPS position as a waypoint

To save your current GPS position as a waypoint:

- Do *one* of the following:
  - Press **9**|GPS.
  - From the main menu, select (**General**), then (**GPS**).
- Press (**Save**).
- Enter the name that you want to use for the waypoint.
- Press (**Options**), scroll to **Save**, then press (**Select**) to save the waypoint.

Selecting a waypoint

To select a waypoint:

- Do *one* of the following:
  - Press **9**|GPS.
  - From the main menu, select (**General**), then (**GPS**).
- Press ▶ to move to the **Distance and Bearing** tab.
- Press (**Waypoint**).
- Press ◀ or ▶ to select the **Waypoint** tab.
- Press ▼ to move to the waypoint that you want to set.
- Press (**Options**), scroll to **Set**, then press (**Select**).

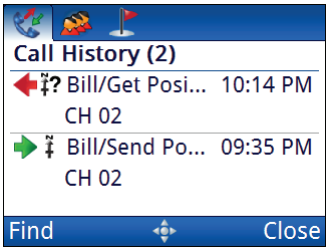
Updating a waypoint from the Call History

You can update a waypoint using information from a Get Position call or a received Send Position call in the Call History. If you do not want to use the waypoint information immediately, you may save it. Waypoints that are saved via the **Distance and Bearing** tab are automatically added to the **Waypoints** tab at the same location, and to the list of waypoints in **User Data** > **Waypoints**.

To update a waypoint from the Call History:

- Do *one* of the following:
  - Press **9**|GPS.
  - From the main menu, select (**General**), then (**GPS**).
- Press ▶ to move to the **Distance and Bearing** tab.
- Press (**Waypoint**), then press ◀ or ▶ to select the **Call History** tab.

  The information available is filtered on Get Position calls that you have sent and Send Position calls that you have received.



- Press ▲ or ▼ to scroll to the call containing the GPS information that you want to use for the waypoint.
- If you want to set the GPS information as the current waypoint, press (**Options**), scroll to **Set**, then press (**Select**).
- If you want to save the GPS information as a waypoint:
  - Press (**Options**), scroll to **Save**, then press (**Select**).
  - Enter the name that you want to use for the waypoint.

    NOTE: If required, you can change the GPS information.
  - Press (**Options**), scroll to **Save**, then press (**Select**).
- Press (**Close**).

Related links:

Entering GPS information on page 367

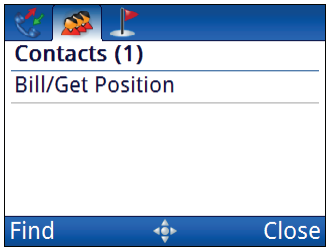
Updating a waypoint from a contact

You can update a waypoint using information gathered from a Get Position call for a contact.

To update a waypoint from a contact:

- Do *one* of the following:
  - Press **9**|GPS.
  - From the main menu, select (**General**), then (**GPS**).
- Press ▶ to move to the **Distance and Bearing** tab.
- Press (**Waypoint**), then press ◀ or ▶ to select the **Contacts** tab.

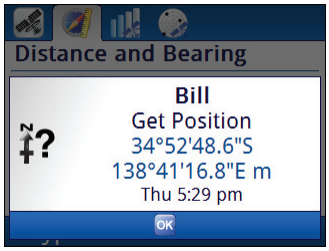
  The information available is filtered on Get Position calls to contacts that have been set up in **User Data** > **Contacts**.



- Press ▲ or ▼ to scroll to the contact whose GPS information you want to use for the waypoint.
- Press (**Options**), scroll to **Call**, then press (**Select**).

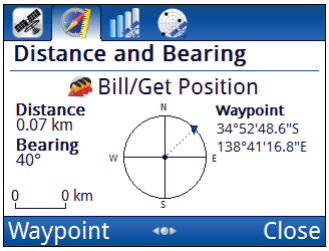
  If prompted, select a channel, then press **OK**.

  The GPS information appears in an incoming call pop-up.



- Press **OK**.

  The waypoint information is updated, and the source of the GPS information is shown at the top of the screen.



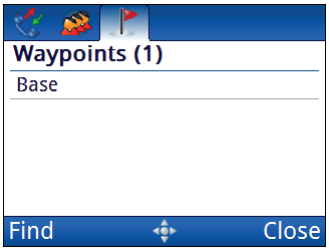
- Press (**Close**).

Adding a waypoint

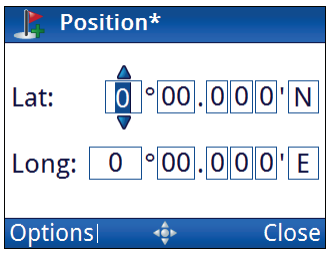
You can create a waypoint by entering GPS information and providing it with a meaningful name. The waypoint can be saved for future use.

To add a waypoint:

- Do *one* of the following:
  - Press **9**|GPS.
  - From the main menu, select (**General**), then (**GPS**).
- Press ▶ to move to the **Distance and Bearing** tab.
- Press (**Waypoint**), then press ◀ or ▶ to select the **Waypoints** tab.



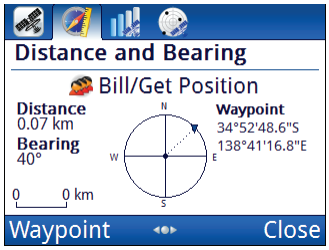
- Do *one* of the following:
  - If there are no waypoints programmed in the transceiver, press (**Add**).
  - If there are some existing waypoints programmed in the transceiver, scroll to the waypoint after which you want to add the new waypoint, press (**Options**), scroll to **Add**, then press (**Select**).
- Enter the name that you want to use for the waypoint.
- Press ▼ to move to the **Position** entry, then press ▶.



NOTE: The format of the GPS information is set in **Settings** > **GPS** > **GPS Format Options**.

- Do *one* of the following:
  - To use your current location, press (**Options**), scroll to **Use GPS**, then press (**Select**).
  - To enter a new location, press ▲ or ▼ to scroll to the value or use the numeric keys to enter the value that you want to set, then press ▶ to move to the next field.
- Press (**Options**), scroll to **Save**, then press (**Select**) to save the GPS information.
- Press (**Options**), scroll to **Save**, then press (**Select**) to save the waypoint.
- Press (**Close**).

  The waypoint information is updated, and the source of the GPS information is shown at the top of the screen.



Related links:

GPS Format Options on page 366

Finding a waypoint

To find a waypoint:

- Do *one* of the following:
  - Press **9**|GPS.
  - From the main menu, select (**General**), then (**GPS**).
- Press ▶ to move to the **Distance and Bearing** tab.
- Press (**Waypoint**).
- Press ◀ or ▶ to select the tab in which you want to search.
- Press (**Find**).
- Enter the letter or number on which you want to search.

  Any entries or values that contain the character you have entered are shown in a list, with the character highlighted.
- Enter more characters to refine your search.
- Press ▲ or ▼ to scroll to the waypoint, then press (**OK**) to select it.

Viewing the details of a waypoint

To view the details of a waypoint:

- Do *one* of the following:
  - Press **9**|GPS.
  - From the main menu, select (**General**), then (**GPS**).
- Press ▶ to move to the **Distance and Bearing** tab.
- Press (**Waypoint**).
- Press ◀ or ▶ to select the **Call History**, **Contacts** or **Waypoints** tab.
- Press ▲ or ▼ to scroll to the waypoint that you want to view.

  The call details, call information, or waypoint position is shown respectively.
- Press (**Options**), scroll to **Details**, then press (**Select**).

Viewing GPS information

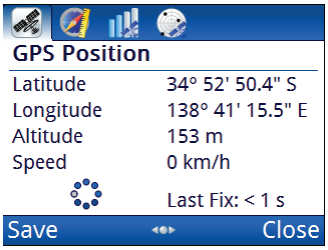
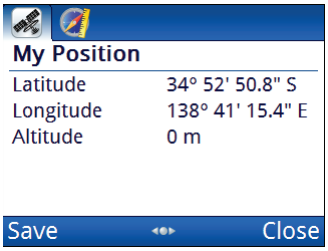
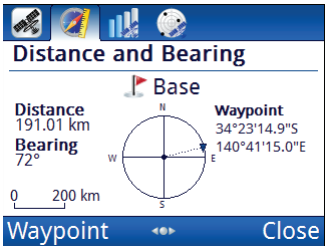
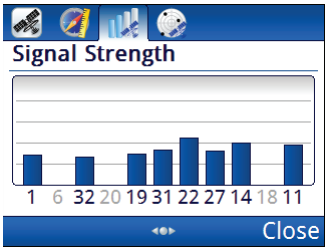
NOTE: You can view GPS information if the GPS Call option is installed. GPS information may be provided via a connected GPS receiver that is selected as a peripheral device or data entered into **Settings** > **GPS** > **My Position**.

To view GPS information:

- Do *one* of the following:
  - Press **9**|GPS.
  - From the main menu, select (**General**), then (**GPS**).
- Press ▶ to move to the tab that you want to view.

  NOTE: The **Signal Strength** and **Satellites Constellation** tabs are available only when a GPS receiver is used to provide the GPS information.

Table 4: GPS information

Tab	Description
 	Shows the latitude and longitude readings from a GPS receiver, or from **Settings** > **GPS** > **My Position**. Altitude and speed readings are hidden by default. The spinning circle shows that the GPS receiver is active, and the Last Fix reading shows the time lapse from the last receipt of valid GPS information.
	Shows the distance and bearing from your location to a selected waypoint.
	Shows the signal strength from each visible satellite. The number represents a particular satellite, and its location is shown on the **Satellites Constellation** tab. Satellites with a blue signal strength provide information for the GPS location.
	Shows a map of visible satellites. The satellites that are coloured blue provide the strongest signals and this information is used to establish the position of the receiver. The other satellites are visible, but the signal is weaker and the information is ignored.

- Press (**Close**).

Related links:

My Position on page 366
GPS Show Options on page 365
GPS Format Options on page 366

Using encryption

Related links:

Encryption options on page 423

Switching the secure feature on or off

The 2220 Handset and 2230 Desk Console have a hot key that accesses the secure feature directly. With the 2221 Handset, you access the secure feature by pressing (**Options**), or via (**Functions**) on the main menu screen. When you switch on secure mode, all encryptors/scramblers that are activated in your transceiver go secure. When AES-256 DV and data encryptors are used at the same time, they use the same secure key.

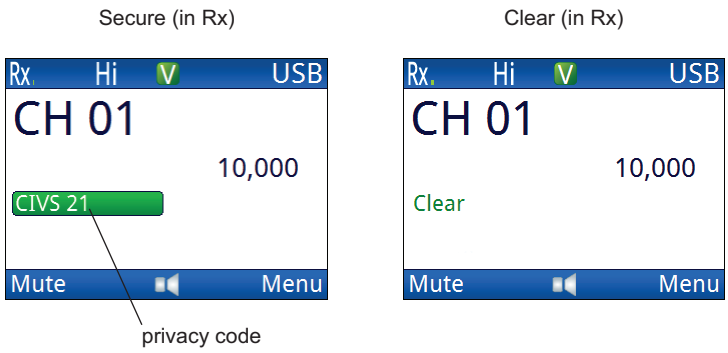
If you want secure to remain on at all times, you set this in **Settings** > **Security** > **Secure Start State**.

To switch the secure feature on or off:

- If you are using a 2220 Handset or 2230 Desk Console, press SEC.
- If you are using a 2221 Handset:
  - Press (**Options**).
  - Press ▲ or ▼ to scroll to the **Secure On** | **Secure Off** option.
  - Press (**Select**).

  Secure is toggled on or off across all active encryptors/scramblers.

  For CIVS voice scrambling you will see:

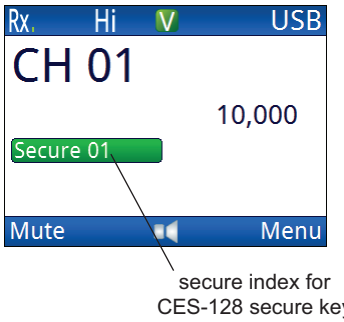


Transmit (while secure)

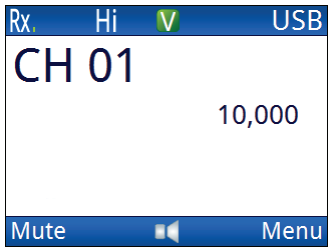
Receive (while secure)

For CES-128 voice encryption you will see:

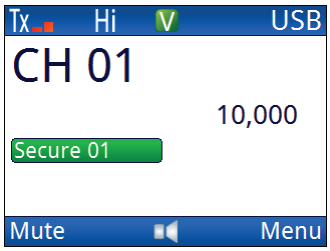
Secure (in Rx)



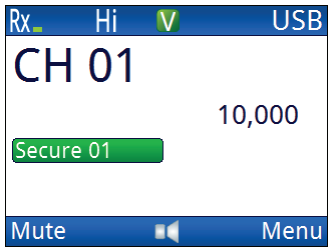
Clear (in Rx)



Transmit (while secure)

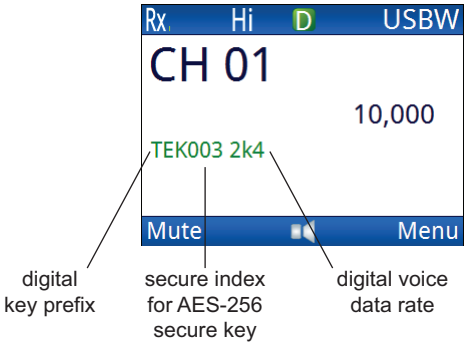


Receive (while secure)

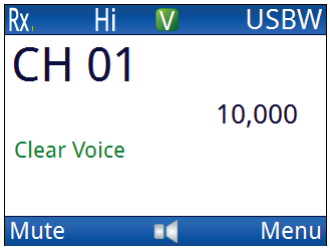


For AES-256 digital voice you will see:

Analogue (in Rx)



Clear (in Rx)

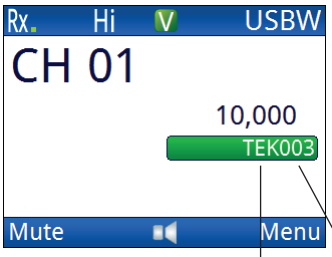


Transmit (while secure)

Receiving DV (while secure)

For AES-256 data encryption you will see:

Secure (in Rx)

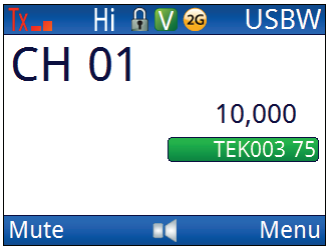


Clear (in Rx)

digital key prefix

secure index for AES-256 data secure key

Transmit (while secure)



Receive (while secure)

For DVP-200 you will see:

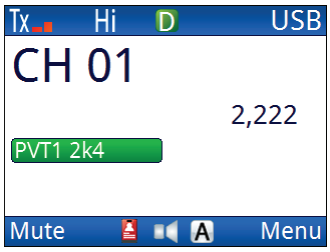
Secure (in Rx)

Clear (in Rx)

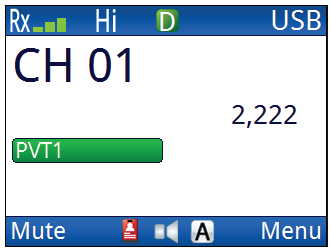
secure index for DVP-200 secure key

DVP-200 data rate

Transmit (while secure)



Receive (while secure)



NOTE: If you have more than one encryptor/scrambler available for activation, you can change to another encryptor/scrambler, if permitted.

- If you are using CES-128 voice encryption with a 2220 Handset or 2230 Desk Console, press ✱to go to secure standby mode, if enabled and required.

Standby

- If you are using CES-128 voice encryption with a 2221 Handset, do the following to go to secure standby mode:
  - Press (**Options**).
  - Press ▲ or ▼ to scroll to the **Standby On** option.
  - Press (**Select**).

Selecting a secure key

If an encryptor contains two or more keys, you have the option of selecting a different key for encryption, if permitted. When AES-256 DV and data encryptors are used together, the selected key is common to both.

NOTE: Secure keys can also be selected from the Codan Convoy Web Portal.

NOTE: With DVP-200, all 8 private keys will always be available for selection, and the public key will also be available if a successful public key exchange has been performed. However, these private keys may not be valid. In this case, the text in the status area will indicate the selected key, but it will flash in a similar manner as the DVP-200 front panel.

To select a secure key:

- If you are using a 2220 Handset or 2230 Desk Console, do *one* of the following:
  - From the main menu,select (**General**), then (**Secure**).
  - *Hold* SEC.
- If you are using a 2221 Handset:
  - From the main menu, select (**Functions**).
  - Press ▲ or ▼ to scroll to the **Secure Info** function.
  - Press (**Select**).
- Press ▲ or ▼ to scroll to the **Select Key Index** entry.

- Press ◀ or ▶ to select thesecure key indexthat you want to use.

  Hold the key to scroll rapidly through the secure key indexes.
- Press (**Activate**).

  The transceiver goes secure on the selected key.

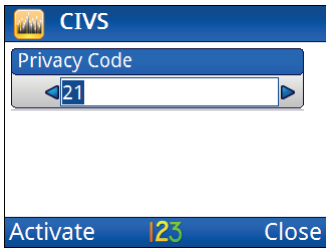
Changing the privacy code

The CIVS scrambler operates on one of 32 codes. You can change the current privacy code, if permitted.

To change the privacy code:

- If you are using a 2220 Handset or 2230 Desk Console, do *one* of the following:
  - From the main menu, select (**General**), then (**Secure**).
  - *Hold* SEC.

- If you are using a 2221 Handset:
  - From the main menu, select (**Functions**).
  - Press ▲ or ▼ to scroll to the **Secure Info** function.
  - Press (**Select**).
- Press ▲ or ▼ to scroll to the **Privacy Code** entry.



- Press ◀ or ▶ to select the code that you want to use.

  Hold the key to scroll rapidly through the codes.
- Press (**Activate**).

  The transceiver goes secure on the selected code.

Adding a secure key

NOTE: Codan's KMS may be used to generate secure keys and to fill the CES and AES DV and data encryptors. KFS may be used to fill keys to these encryptors.

NOTE: VCOM is used to provide virtual COM ports for programming secure keys via KMS/KFS over the USB connector on the control point.

NOTE: Only one application connected via VCOM may be serviced by the RFU at a time. Refer to *Using VCOM services* on page 135 for further details on this limitation.

NOTE: Secure keys can also be programmed from the Codan Convoy Web Portal or via a USB stick. Refer to *Upgrading the transceiver via a USB stick* on page 125 for more information about programming secure keys via a USB stick.

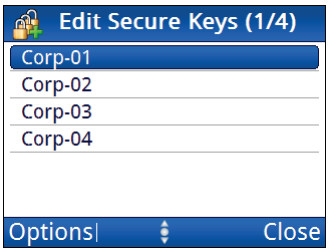
If you are permitted to add a secure key for a CES-128 or AES-256 encryptor via the user interface of the control point, the transceiver automatically selects the next empty secure index into which you can enter a secure key. You cannot select the secure key index.

NOTE: AES-256 DV and data encryptors use the same secure key.

NOTE: You cannot add keys for the DVP-200 via the control point, KMS/KFS, Codan Convoy or USB sticks.

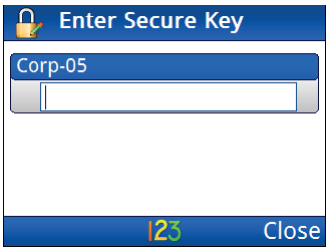
To add a secure key:

- If you are using a 2220 Handset or 2230 Desk Console, do *one* of the following:
  - From the main menu,select (**General**), then (**Secure**).
  - *Hold* SEC.
- If you are using a 2221 Handset:
  - From the main menu, select (**Functions**).
  - Press ▲ or ▼ to scroll to the **Secure Info** function.
  - Press (**Select**).
- Press ▲ or ▼ to scroll to the **Edit Keys** entry.
- Press ▶.



- Press (**Options**), scroll to **Add** , then press (**Select**).

NOTE: If all secure key indexes contain a key, **Add** is not shown as an option.



- Enter the charactersthat you want to usefor the secure key.
- Press (**Save**) to save the information.
- Press (**Close**).

Related links:

Using VCOM services on page 135

Using a crosspatch

Overview of the 3031 Crosspatch

The 3031 Crosspatch is a device that connects an HF communication system with a VHF or UHF communication system.

NOTE: For details on installing the crosspatch and its operation, please see the documentation provided with the device.

NOTE: The 3031 Crosspatch may only be used via the RFU GP port connector. It is not supported via the Console GP port connector.

NOTE: If a 3031 Crosspatch is connected as a peripheral device to the GP port connector and you want to be able to receive calls that are specifically addressed to the crosspatch, its self address must be entered in the **Settings** > **Connectors** > **RFU GP Port** > **RFU GP Port Startup** entry, for example **selfid 3031**

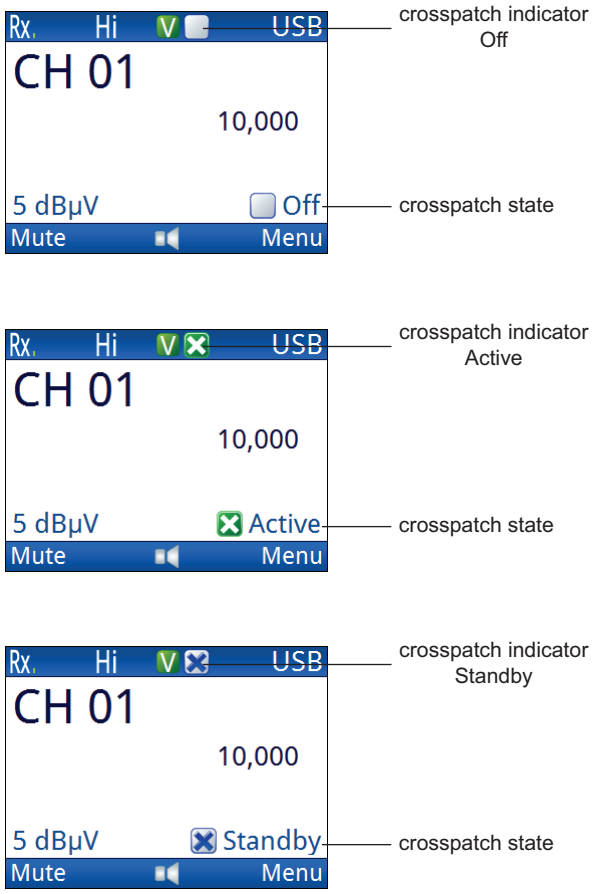
NOTE: If you use the crosspatch with digital voice, you can set in **Settings** > **Connectors** > **RFU GP Port** > **RFU Analogue Passthrough** whether analogue audio and digital voice are passed to the crosspatch when digital voice is active, or only digital voice is passed to the crosspatch.

NOTE: The use of the CIVS voice scrambler is not recommended across VHF/UHF to HF communication links.

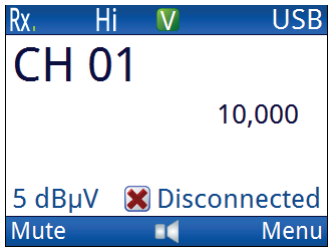
The operating mode of the crosspatch may be controlled directly by the transceiver, or by using DTMF commands on a DTMF-capable VHF/UHF transceiver.

The crosspatch may be active, on standby, or switched off. The status of the crosspatch is shown in the status bar, and you can set the status to be shown in one of the status areas.

Figure 30: Crosspatch status



If the crosspatch is selected as the peripheral device for the GP port connector, but has been disconnected, the crosspatch indicator is no longer shown in the status bar of the channel screen.



Related links:

RFU Analogue Passthrough on page 246
Selecting a peripheral device on page 238
Selecting information to be shown in a status area on page 31

Changing the operating mode of the crosspatch

To change the operating mode of the crosspatch:

- If you are using a 2220 Handset or 2230 Desk Console, press **5**.
- If you are using a 2221 Handset:
  - From the main menu, select (**Functions**).
  - Press ▲ or ▼ to scroll to the **Next Crosspatch State** function.
  - Press (**Select**).

  The crosspatch toggles between the following states:
  - Off
  - Active
  - Standby

  NOTE: If the status shows **Disconnected**, the crosspatch may not be connected.

Using Codan Convoy

Overview of Codan Convoy

Access to Codan Convoy is available if a cellular/satellite modem is connected to your RFU GP Port, and the selected RFU GP Port peripheral device is 'Cell/Sat Modem'.

Codan Convoy provides the following high-level capabilities over a cellular or satellite communications link:

- The ability to send/receive SMS messages to/from a mobile phone
- The ability to send/receive Web Messages to/from an internet based Web Portal
- The ability for a transceiver to be managed from an internet based Web Portal (which includes abilities such as being able to program secure keys into a transceiver, determine a transceiver's GPS position, and so on)

Setting up Codan Convoy

Codan Convoy can be setup by selecting the "Cell/Sat Modem" peripheral device on the RFU GP Port (refer to *Selecting a peripheral device* on page 238 for instructions on how to set a peripheral).

A cellular/satellite modem must also be connected to the RFU GP Port. The currently supported modems include:

- Obrcomm IDP-782 modem (cellular and satellite capability)

  This modem may be connected via Codan cable part numbers 08-07447-001 (primary 6m RFU GP Port cable) and 08-07471-001 (0.5m cable extension to attach to the modem)

- Orbcomm IDP-680 modem (satellite capability only)

  This modem may be connected using Codan cable part numbers 08-07447-001 (primary 6m RFU GP Port cable) and 08-07470-001 (0.5m cable extension to attach to the modem)

NOTE: In a mobile installation, the ignition sense line of the cellular/satellite modem should be connected to the IGN/RUN circuit of the vehicle rather than the ACCY circuit (i.e. 12V DC / cigarette lighter).

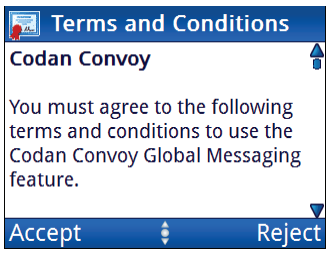
Terms And Conditions

To send and receive SMS and Web Message calls on a particular control point, you must first accept the terms and conditions for Codan Convoy.

The terms and conditions are displayed whenever you try to use these call types and have not yet accepted them. To accept the terms and conditions, press (**Accept**) when the terms and conditions screen is displayed.

NOTE: The terms and conditions screen is also accessible via **Menu** > **Information** > **Terms**.

Figure 31: Terms and Conditions display



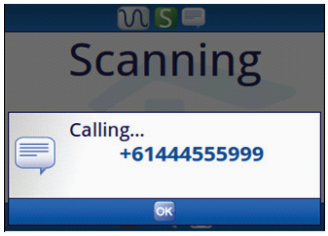
Once accepted, the Codan Convoy call types are able to be used on that particular control point indefinitely. In a multi-control point configuration, the terms and conditions also need to be accepted on each control point you intend to use these call types on.

Outgoing Codan Convoy Calls

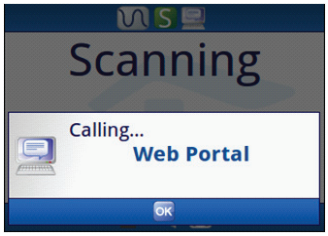
To make an outgoing SMS call, refer to *Making an SMS call* on page 74. To make an outgoing Web Message call, refer to *Making a Web Message call* on page 76. An overview of these call types is provided in *Call types* on page 574.

After placing either of these calls types, the status bar is updated with the relevant call icon to the right of the scan indicator position:

SMS call in progress

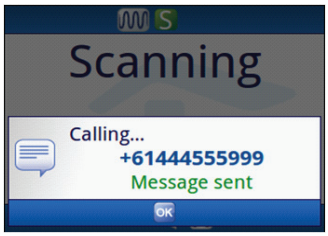


Web Message call in progress

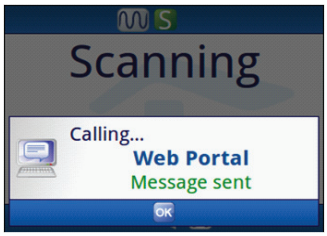


If the call is successful, success beeps are played, the call icon is removed from the status bar and a ‘Message Sent’ pop-up is displayed:

SMS call success

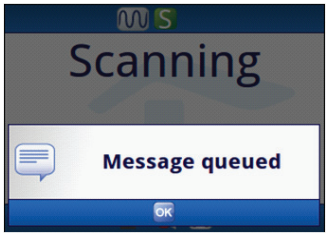


Web Message call success

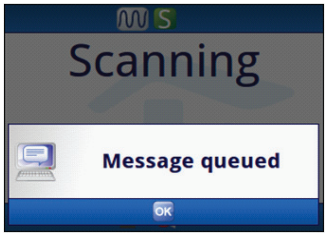


Codan Convoy calls take a few seconds to successfully transmit. However, if the modem is unable to transmit the call within ten (10) seconds due to unavailability of the cellular or satellite link, then the following pop-ups will be displayed for the respective call types:

Queued SMS call

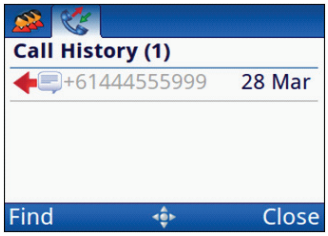


Queued Web Message call

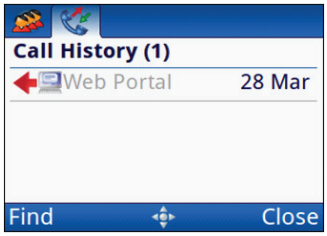


When the above pop-up is displayed, the Codan Convoy call is queued in the cellular/satellite modem for transmission and will be attempted to be re-sent when the cellular or satellite link becomes available. Until it is successfully re-sent, the queued call is evident in the call history as a greyed-out entry:

Queued SMS call

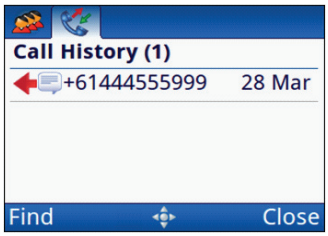


Queued Web Message call

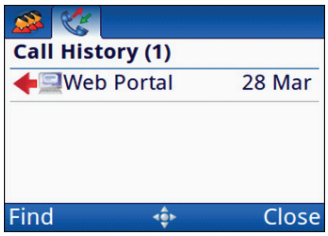


Providing the control point is connected when the re-transmission is attempted, the call history will be updated to indicate that the call was sent by un-greying the entry:

Sent SMS call



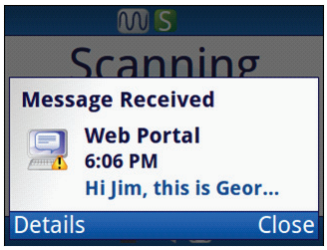
Sent Web Message call



Incoming Codan Convoy Calls

When an incoming Codan Convoy call is received, the call is displayed on the screen and stored in the Call History. The transceiver can receive these calls at any point, even while the transceiver is in a normal radio call (e.g., a Selective call). The transceiver does not have to be scanning to receive these calls.

Figure 32: Example of received Web Message



When you read the message (or select **Mark All As Read** in Call History), an acknowledgement is sent over-the-air to the initiator as a confirmation that you have received and read the message. For a Web Message call, the Web Portal operator may confirm reception of a read receipt by inspection of the message logs. For an SMS call, the mobile phone user will be sent a reply SMS indicating that the original message was read.

Using an external power amplifier

Overview of the 3061 & 3062 power amplifiers

The 3061 and 3062 power amplifiers provide 500 W PEP and 1000 W PEP output power respectively, and are suitable for voice and data operation.

NOTE: For details on installing the external power amplifier and its operation, please see the 3061/3062 Power Amplifiers Reference Manual, Codan part number 15-04131-EN.

NOTE: Codan's power amplifiers are fully protected against all load conditions and excessive heat sink temperatures. They are capable of operating with a VSWR of up to 3:1 by reducing output power. When excessive VSWR or over temperature occurs, the amplifiers switch to by-pass mode in order to prevent permanent damage.

NOTE: In by-pass mode, the full output power of the attached Envoy® transceiver is available as a backup to keep the station operational and on-air.

The external power amplifier is connected to the Envoy® transceiver through the Antenna Control cable (08-05627-00x). In order to transmit with the external power amplifier, you need to set the Tx power setting to **PA**.

Inspecting the status of the power amplifier

The Envoy transceiver enables a user to easily inspect the operating status of a connected power amplifier. It retrieves the runtime status information from the power amplifier and presents it to the user after every transmission.

NOTE: This feature is available only if the power amplifier's control board firmware version is 2 or higher. Refer to *Checking the power amplifier's control board firmware version* on page 122 for instructions about checking the power amplifier's control board firmware version.

There are two ways to view the status of the connected power amplifier. You can view it in the status areas, or in the HPA Status screen.

Displaying the power amplifier status in the status areas

To display the power amplifier status in the status areas:

- Set up one or more of the status areas to display the following status:
  - PA Temperature
  - Tx Power
  - Voltage
  - SWR

NOTE: Refer to *Selecting information to be shown in a status area* on page 31 for further details about showing information in the status areas.

Viewing the power amplifier status in the HPA status screen

To view the power amplifier status in the HPA status screen:

- From the main menu, select (**General**), then (**HPA Status**).
- Press ▲ or ▼ to scroll through the power amplifier's status information.

Viewing the fault state of the power amplifier

When fault condition occurs, the power amplifier will switch to by-pass mode to prevent permanent damage, and a pop-up message will be shown on the connected Envoy control point to indicate the fault condition.

NOTE: This feature is available only if the power amplifier's control board firmware version is 2 or higher. Refer to *Checking the power amplifier's control board firmware version* on page 122 for instructions about checking the power amplifier's control board firmware version.

To view a power amplifier's fault conditions:

- From the main menu, select (**General**), then (**HPA Status**).
- Press (**Fault Info**).

- Press ▲ or ▼ to scroll through the current and historical fault conditions.

NOTE: The historical fault list will be cleared when the Envoy transceiver is switched off or restarted.

Clearing the fault state of the power amplifier

When fault condition occurs, the power amplifier will switch to by-pass mode to prevent permanent damage. Clearing the fault condition will bring the power amplifiers back to active mode.

NOTE: This feature is available only if the power amplifier's control board firmware version is 2 or higher. Refer to *Checking the power amplifier's control board firmware version* on page 122 for instructions about checking the power amplifier's control board firmware version.

To clear a power amplifier's fault conditions:

- From the main menu, select (**General**), then (**HPA Status**).
- Press (**Fault Info**).
- Press (**Clear**).

CAUTION: Clearing a fault condition may not fix the underlying hardware fault. If the fault condition returns, please contact Codan.

Checking the power amplifier's control board firmware version

You can check the power amplifier's control board firmware version in two ways, from the power amplifier's serial number or from the HPA status screen.

The serial number can be found on the label stuck on the back of the power amplifier. If the build standard letter (the last alphabetical letter in the serial number) is B, it means the firmware version of this power amplifier's control board is 1. If the build standard letter is C, then the control board firmware version is 2.

To check the control board firmware version from the HPA status screen:

- From the main menu, select (**General**), then (**HPA Status**).

If the HPA is connected and operational and the HPA status screen prompts "HPA Controller not supported", it means the power amplifier's controller board firmware version is 1. Otherwise the control board firmware version will be displayed in this screen.

Abandoning your transceiver

Your transceiver may contain sensitive information that you do not want third parties to access in the event of having to abandon your location and transceiver. You can render your transceiver inoperable in the field.

CAUTION: Your transceiver may need to be reprogrammed by your system administrator in order to make it operational again.

To abandon your transceiver:

- *Hold* ⏻ and press ⚠ briefly.

- Press **OK**.

Related links:

Abandon Mode on page 334

Upgrading the transceiver via a USB stick

Firmware packages for the transceiver or the RM50 module, profiles from TPS System Programmer, and secure keys from KMS may be loaded onto a USB stick, providing a portable method of upgrading transceivers in the field. You can also read a profile from a transceiver in the field. When the USB stick is connected to the control point, a selection menu is shown for various activities depending on the values set in **Settings** > **General** > **USB User Access**.

If you have multiple control points connected to the RFU during any of the following operations, the control point that initiates the operation displays the progress. All other control points display a message indicating that the RFU is busy.

To manage profiles, firmware, and secure keys:

- Connect your USB stick to the control point using a standard USB A (female) to micro USB cable (Codan part number 67-90406).

  The USB stick is detected automatically. A **Select Task** icon () is now available in the main menu screen.

- Enter the correct admin PIN, if requested.

- Press ▲ or ▼ to scroll to the activity that you want to perform:

  - If you want to program a profile from the USB stick to the transceiver, select **Program Profile**.

    NOTE: You will be prompted to enter a self address for each HF network that has empty self address. For an HF network that matches the name and call system of an HF network already programmed into the transceiver, you will be able to keep the existing self address.

  - If you want to read the profile from the transceiver to the USB stick, select **Read Profile**.

  - If you want to upgrade the transceiver with a firmware package on the USB stick, select **Upgrade Firmware**.

  - If you want to upgrade the RM50 module with a RM50 firmware package on the USB stick, select **Upgrade RM50 Firmware**.

    NOTE: The RM50 module is a hardware board optionally fitted in the Envoy radio that enables DV options with/without an AES-256 Encryption upgrade and MIL/STANAG 2G Data option. Please refer to *Overview of digital voice options* on page 388 and *MIL/STANAG 2G Data* on page 412 for further information.

CAUTION: A permit from the Australian government is required if you want to upgrade the RM50 module with an export controlled version firmware package, which enables AES-256 Encryption and Low Rate DV capabilities.

- If you want to program secure keys to a transceiver that has an encryptor module enabled, select **Program Secure Keys**.

  CAUTION: If you have CES and AES DV encryptors present, the keys for these must be programmed simultaneously.

- Do *one* of the following:
  - Press ▲ or ▼ to scroll to the profile, firmware package, or key set file, press (**Options**), scroll to **Open**, then press (**Select**).
  - Press ▲ or ▼ to scroll to the folder in which you want to save the profile from the transceiver, then press (**Save**).
- Press (**Yes**) to confirm that you want to complete the selected action.
- Perform more tasks with the USB stick as required.
- Press (**Eject**) when you have finished working with the USB stick.
- Remove the USB stick from the control point.

Related links:

USB User Access on page 308
The channel screen on page 27

Using GPS Plotter

Related links:

Overview of GPS Plotter on page 127
Setting up a GPS Plotter session on page 127
Setting up the contexts for GPS Plotter output on page 129
GPS Plotter behaviour in multi-control point environment on page 131
Using the "echogps" serial command on page 131

Overview of GPS Plotter

Access to the GPS Plotter feature is available if you have the GPS Call option enabled in your transceiver.

The GPS Plotter feature allows a GPS position associated with certain user interface contexts to be output to particular serial port(s) in the system. When a context is triggered (for example, selecting an entry in the call log that contains a GPS position), the position is output to all serial port(s) that are configured for the GPS Plotter function. The output will continue at a periodic rate until the context ceases.

The contexts where GPS Plotter behaviour is triggered are controlled by two settings, **Output Local GPS** and **GPS Plotter Contexts**.

The GPS Plotter output is formatted in NMEA 0183 RMC format.

NOTE: If configured, the GPS Plotter output can be accessed from all serial ports provided by the Envoy transceiver, including RFU GP port, RFU 6-way port, console GP port, VCOM ports and CICS over IP port.

Related links:

GPS Plotter Contexts on page 368
Output Local GPS on page 369

Setting up a GPS Plotter session

The GPS Plotter function may be setup on any combination of the ports/interfaces as listed below:

- RFU GP port
- RFU 6-way GPIO port
- Console GP port
- VCOM GPS Plotter port
- VCOM CICS port
- CICS over IP

For the RFU GP port, RFU 6-way port and Console GP port, the GPS Plotter function can be setup by selecting one of the "GPS Plotter", "PC" or "User-Defined" peripheral device on the desired port(s). Refer to *Selecting a peripheral device* on page 238 if the GPS Plotter needs to be enabled on any of these ports.

NOTE: Selecting **GPS Plotter** as the peripheral device for these ports ensures the GPS data output is standalone and not interleaved with any other transceiver output (e.g., CICS messages). Selecting either **PC**, or **User-Defined** (with GP Port Mode/6-way Mode not set to GPS Plotter), will cause interleaving of other transceiver output with the GPS Plotter output. For "User-Defined" the interleaving can be avoided by ensuring the GP Port Mode/6-way Mode is set to GPS Plotter.

For the VCOM GPS Plotter and VCOM CICS ports, the GPS Plotter function can be setup by enabling the respective port in the VCOM configuration. To view or change the virtual COM port settings from your PC, launch **VCOM Configuration** from **Start** > **All Programs** > **Codan** > **VCOM**.

NOTE: Using the VCOM GPS Plotter port ensures the GPS data output is standalone and not interleaved with any other transceiver output. Using the VCOM CICS port will cause interleaving of other transceiver output (e.g., CICS messages) with the GPS Plotter output.

For the CICS over IP port, the GPS Plotter function can be setup by enabling the setting in **Settings** > **Configuration** > **CICS over IP**. This CICS port can be connected on port number 23.

NOTE: Using the CICS over IP port will cause interleaving of other transceiver output with the GPS Plotter output.

When a GPS Plotter session commences, the current state of the **Output Local GPS and GPS Plotter Contexts** settings determines the initial GPS Plotter behaviour. These settings may be changed at run-time to change the behaviour in all running GPS Plotter sessions.

NOTE: For the RFU GP port ("PC" or "User-Defined"), RFU 6-way ("PC" or "User-Defined"), Console GP port ("PC" or "User-Defined"), VCOM CICS port and CICS over IP ports, the GPS Plotter output will not commence until "echogps on" (or "echogps <value>", with value greater than 0) is executed in the respective serial session. Refer to *Using the "echogps" serial command* on page 131 for details on how to change GPS Plotter behaviour in a particular session.

NOTE: For the RFU GP port ("PC" or "User-Defined"), RFU 6-way ("PC" or "User-Defined"), Console GP Port ("PC" or "User-Defined") ports, the initial behaviour may be overridden by use of the RFU GP Port Startup, RFU 6-way Startup and Console GP Port Startup settings, respectively, through specification of the "echogps" command.

Related links:

Selecting a peripheral device on page 238
Using the "echogps" serial command on page 131
CICS Over IP on page 334
RFU GP Port Startup on page 243
RFU 6way Startup on page 249
VCOM CICS Startup on page 334
Console GP Port Startup on page 251

Setting up the contexts for GPS Plotter output

To control whether the current transceiver position is output every ten (10) seconds to all running GPS Plotter sessions, set **Settings** > **GPS** > **Output Local GPS** to either Enabled or Disabled. The current transceiver position is the current GPS receiver position (if available), otherwise the "My Position" setting is used if programmed. If no transceiver position is available, then no output will occur if this setting is enabled.

To control the viewing contexts that trigger GPS position output, set **Settings** > **GPS** > **GPS Plotter Contexts** accordingly. When one of the contexts occurs, and that context is enabled in the GPS Plotter Contexts setting, then the GPS position associated with that context is output (at the indicated rate) to all running GPS Plotters sessions until the context ceases.

NOTE: In the majority of cases, while a viewing context is triggered, the Output Local GPS behaviour is temporarily halted until the viewing context ceases. The single exception is the Distance & Bearing context, where Output Local GPS behaviour will continue if enabled.

Table 5: Description of GPS Plotter Contexts

GPS Plotter Context	Context Meaning	Position Output Rate(s)
Call pop-ups	This context occurs while a call pop-up (with GPS position) is visible.	2
Incoming calls	This context occurs while an incoming entry in the call log (with GPS position) is selected. It also occurs while viewing the details of that incoming call log entry.	2

Table 5: Description of GPS Plotter Contexts (cont.)

GPS Plotter Context	Context Meaning	Position Output Rate(s)
Outgoing calls	This context occurs while an outgoing entry in the call log (with GPS position) is selected. It also occurs while viewing the details of that outgoing call log entry.	2
Local position	This context occurs while the "GPS Position" (or "My Position") tab in the GPS Screen is visible.	10
Waypoints	This context occurs while a waypoint item in the waypoints user data is selected. It also occurs while viewing the details of a waypoint entry.	2
Distance and bearing	This context occurs while the "Distance & Bearing" tab in the GPS Screen is visible. The selected waypoint is output to the GPS Plotter sessions. In addition, the current transceiver position may also be output providing Output Local GPS is Enabled.	2 (for selected waypoint) 10 (for transceiver position)

Related links:

GPS Plotter Contexts on page 368
Output Local GPS on page 369
My Position on page 366

GPS Plotter behaviour in multi-control point environment

In a system with multi-control points connected to a single RFU, different GPS Plotter viewing contexts may occur simultaneously on each control point. For all the configured GPS Plotter ports described in Setting up a GPS Plotter session (excluding the Console GP port) , this will cause multiple GPS position outputs to occur in each session depending on how many viewing contexts are active (for example, one control point may be viewing a call log entry with GPS position, and another may be viewing a waypoint – if say the RFU GP port is configured for GPS Plotter then both the GPS position from the call log entry and the waypoint will be output to the RFU GP port).

The Console GP port is the exception to this behaviour in that only the viewing contexts triggered on that Console will appear on that port (i.e., triggering of viewing contexts on other control points connected to the radio will not cause output to appear on that Console GP port).

Using the “echogps” serial command

The GPS Plotter behaviour that is normally controlled through use of the Output Local GPS and GPS Plotter Contexts settings may also be controlled by using the “echogps” serial command.

This command may be executed in any GPS Plotter session, and allows GPS Plotter behaviour to be changed “per port” (e.g., the RFU GP port may be configured to behave differently to the VCOM GPS Plotter port). Using this command overrides the current state set by the Output Local GPS and GPS Plotter Contexts settings.

NOTE: Issuing the “help echogps” command provides a detailed description of this feature.

CAUTION: If the Output Local GPS and GPS Plotter Contexts settings are changed after the “echogps” command has been used, then the “echogps” command changes will be overridden.

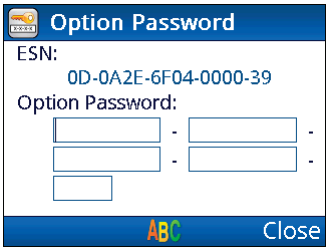
Entering a password for an option

You may purchase new options for your transceiver, as required. You will receive a 26-digit option code that must be entered to enable the option in the transceiver's firmware.

NOTE: If you forget your admin PIN, contact Codan, quote the ESN of your transceiver, and you will be given an option code for deleting the PIN.

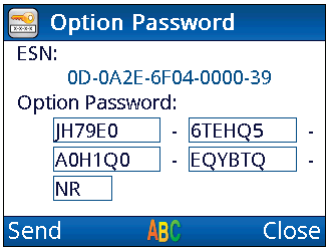
To install an option in the transceiver:

- From the main menu, select (**Information**), then (**Option Password**).



- Enter the password.

  As you enter the last digit, the option to **Send** appears.



- Press (**Send**), then press (**Close**).
- Restart your transceiver.

NOTE: You can also enter the option code from TPS v1.13 or later. For more information, please see TPS User Guide (Codan part number 15-04178-EN issue 7).

Related links:

Viewing information about your transceiver on page 85

Performing a self-test

The Envoy transceiver has a series of built-in tests that may be completed to assess a particular aspect of functionality.

To perform a self-test:

- From the main menu, select (**General**), then (**Self Tests**).

  By default, all self-tests are selected.
- If there is a test that you do not want to perform, press ▲ or ▼ to scroll to the test, then press **OK**.
- Press (**Start**).
- Follow any on-screen prompts.

  At the end of the test a summary of outcomes is provided.
- Press (**Close**).

Related links:

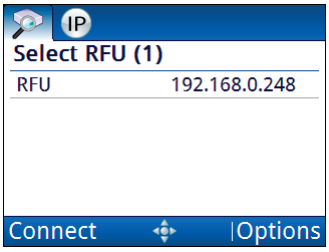
Selecting/deselecting a check box on page 160

Finding an RFU

If your organisation has several RFUs and control points connected to a LAN via an Ethernet switch, you have to allocate a different IP address to each unit in **Settings** > **Connectivity**. When you enter the **Find RFU** screen, the transceiver searches for IP addresses on the LAN and provides a list from which you can select.

To find and connect to an RFU:

- From the main menu, select (**General**), then (**Find RFU**).



- Press ▲ or ▼ to scroll to the RFU to which you want to connect, then press (**Connect**).
- If the RFU to which you want to connect is on a different subnet, do the following:
  - Press ◀ or ▶ to select the **IP** tab.
  - Press ▼ to move to the **Enter RFU Address** entry.
  - Enter the octets of the IP address.

    You may need to press ▶ to move to the next segment.
  - Press (**Connect**).

Related links:

Settings > Connectivity on page 377

Using VCOM services

VCOM is used to provide virtual COM ports for the following services:

- 2.4kbps Data Modem
- CICS
- MIL/STANAG 2G Data
- GPS Plotter (available in VCOM version 1.05 and later)

Each of these services may be only be used one at a time by a client (i.e., they are operated on a "first-come, first-served" basis), which may cause contention if multiple users try to use the same service.

When attempting to use the 2.4kbps Data Modem or MIL/STANAG 2G Data service via VCOM and you find that the port is unresponsive:

- Ensure that both the RFU GP port and RFU 6-way port are not configured to use these services (note that the RFU 6-way does not need to be checked in the case of 2.4kpbs Data Modem as it is not supported on that port).
- Ensure that any instances of VCOM that may be running on any connected PCs are not configured to use these services.

CAUTION: On a PC, an application (e.g., RC50-C) may not even be running and yet the corresponding VCOM instance may be running in the background and consuming that service. To check which VCOM services are enabled on that PC, launch **VCOM Configuration** from **Start** > **All Programs** > **Codan** > **VCOM**, and disable any services that are not needed.

- Ensure that the service isn't already being used by another control point, as indicated by the presence of () for the 2.4kbps Data Modem, or ( ) for MIL/STANAG 2G data, in the status bar. In this case you may need to wait until the other modem session has completed.

When attempting to use the CICS or GPS Plotter service via VCOM and you find that the port is unresponsive, ensure that any instances of VCOM that may be running on any connected PCs are not configured to use that same service.

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4 Navigating the menu structure

This section contains the following topics:

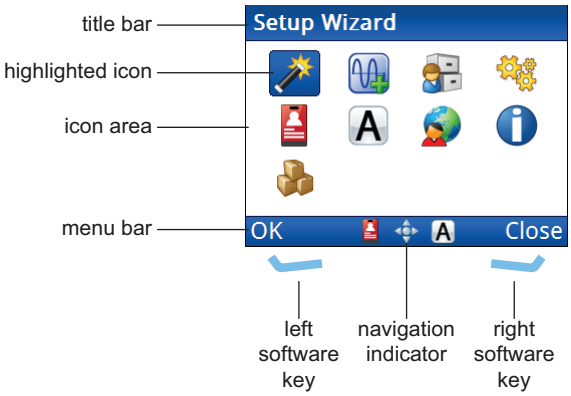
Menu structure

The menu structure comprises a main menu and a series of submenus that are accessed via the main menu. Each menu and submenu is represented by an icon. Some icons provide direct access to an input/view screen, while other icons provide a list of entries for the menu.

The number of icons that are visible on each screen depends on the access level into which you are logged, and the view that is being shown.

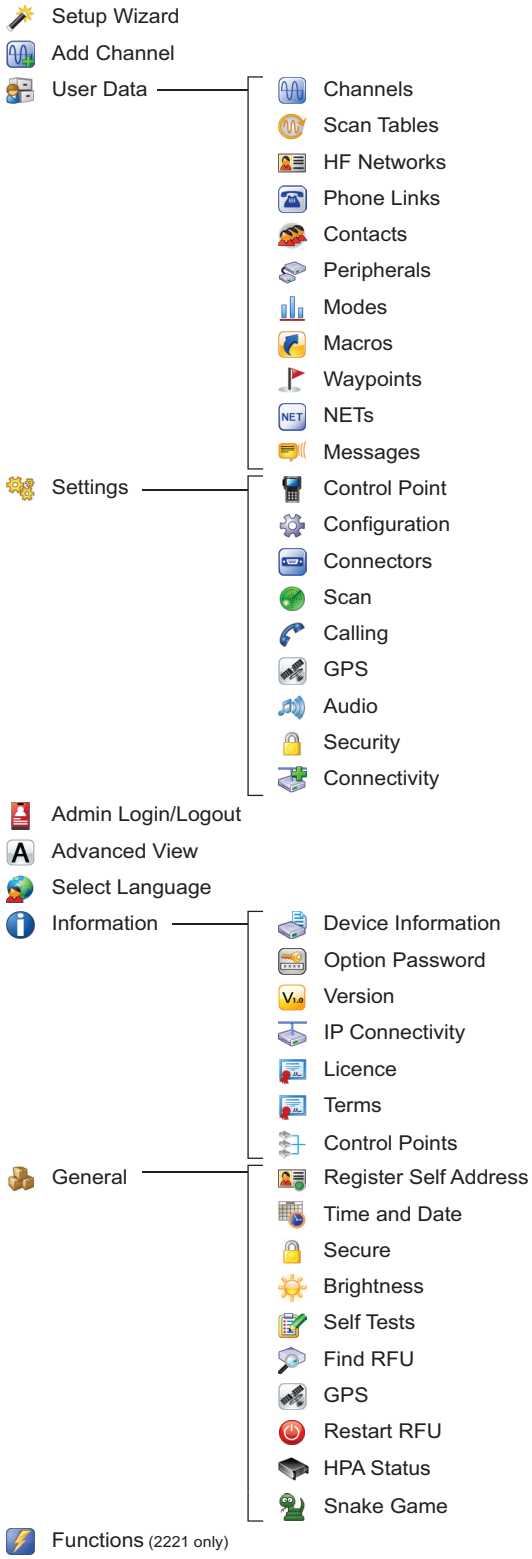
NOTE: Most descriptions in this manual assume that you are logged in to admin level, which automatically shows advanced view. Indicators in the menu bar show the level and view status.

Figure 33: Typical menu screen



When an icon is highlighted, the name of the icon is shown in the title bar of the screen. For example, when the icon is highlighted, **Setup Wizard** is shown in the title bar.

Figure 34: Menu structure (admin level)



The menu items may contain further submenus and lists of entries. Each entry either has specific values from which you may choose, or you may enter the information required.

Related links:

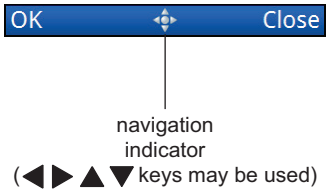
Overview of basic and advanced views on page 143
Switching between basic and advanced views on page 144
Overview of user and admin levels on page 145
Logging in to admin level on page 146
Navigating the menu structure on page 141

Navigating the menu structure

The menu structure comprises a main menu and a series of submenus that are accessed via the main menu. Navigation keys enable you to highlight an icon, then press **OK** to select that menu. You can continue drilling down through the menu structure in this way. At the lowest level of the menu structure there is either an input/view screen, or a list of entries.

Navigation is available when the navigation indicator is shown in the menu bar at the bottom of the screen.

Figure 35: Navigation indicator showing navigation keys that may be used



NOTE: This icon alternates with operational status icons that indicate when the RFU is busy with an activity from a control point in a multiple control point system.

To navigate the menu structure:

- To move down through the menu structure:
  - Press ◀, ▶, ▲ or ▼ to highlight the icon that you want to select.

    The name of the icon appears in the title bar of the screen.

    NOTE: If the right-most icon is highlighted when you press ▶, the highlight wraps to the first icon in the next row of icons.

    NOTE: If the left-most icon is highlighted when you press ◀, the highlight wraps to the last icon in the previous row of icons.
  - Press **OK**.
  - Continue moving down through the menu structure by highlighting the icon that you want, then pressing **OK**.
- To move through a list of entries at the lowest level of the menu structure, press ▲ or ▼.
- To go to the top level in the menu structure, do *one* of the following:
  - Press PTT to exit to the channel screen, then press (**Menu**) to enter the top level of the menu structure.
  - Press to return to the top level of the menu structure, one level at a time.

Related links:

Menu structure on page 138
Selecting an icon on page 150
Selecting a value from a list on page 159
Finding a word or value on page 148
Selecting/deselecting a check box on page 160

Overview of basic and advanced views

There are two views of information in the user interface of the control point: basic and advanced. The contents of basic and advanced views are pre-determined and cannot be changed.

Basic view

Basic view provides a condensed view of the user interface, and typically the view at which the control point is operated. When you power up the transceiver, the control point enters basic view. Basic view is indicated by the absence of an advanced view indicator in the menu bar.

Figure 36: Basic view (no advanced view indicator)

Basic view provides access to items that are likely to be changed on a regular basis, or the user may want to change to suit their preferences for the day-to-day operation of the transceiver. The user can switch to advanced view to access items that they may want to change occasionally. The user should switch back to basic view to simplify the view of information presented on the screen of the control point.

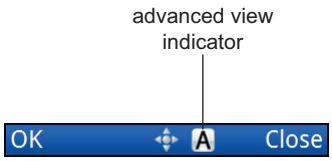
Related links:

Switching between basic and advanced views on page 144

Advanced view

Advanced view provides access to additional settings that may need to be changed occasionally, but are not required in the day-to-day operation of the transceiver. Generally, the control point of the transceiver is in basic view so you must switch to advanced view. Advanced view is indicated by the presence of the advanced view indicator in the menu bar.

Figure 37: Advanced view



Related links:

Switching between basic and advanced views on page 144

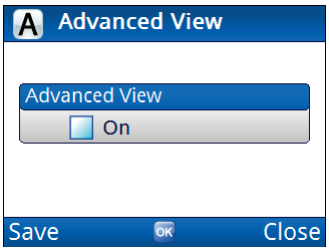
Switching between basic and advanced views

The user can switch between basic and advanced views to either:

- simplify the user interface of the control point (basic view), or
- access advanced settings that they are permitted to change (advanced view)

To switch between views:

- Press ⁀ until the main menu screen is shown.
- From the main menu, select A (**Advanced View**).



- Press **OK** to toggle advanced view on or off as required.
- Press ⁀ (**Save**).

NOTE: You can also use the ⏻ + **2** hot-key sequence to toggle the user interface between basic and advanced views.

Overview of user and admin levels

There are two levels of access to information in the user interface of the control point: user and admin. You can change which entries the user can see and edit by applying access rights to the profile in the TPS System Programmer.

Related links:

Overview of access rights on page 386

User level

User level is the lowest access level, and typically the level at which the transceiver is operated. When you power up the transceiver, it enters user level. User level is indicated by the absence of an admin level indicator to the left of the navigation indicator in the menu bar.

Figure 38: User level (no admin level indicator)

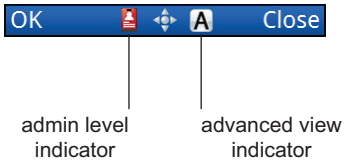
The user should be able to access all necessary information for the day-to-day operation of the transceiver at this level.

Admin level

Admin level is for use by system administrators and is indicated by the presence of the admin level indicator in the menu bar. To access this level, you must log in using the admin PIN set up by your system administrator.

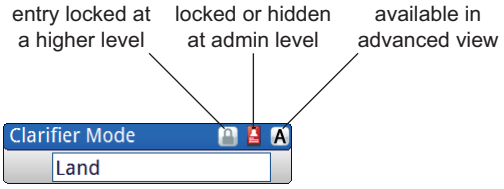
NOTE: By default, logging in to admin level also shows the advanced view of the user interface of the control point.

Figure 39: Admin level



Entries that have been locked and/or hidden at admin level have an admin level indicator at the right of the field and may only be edited at admin level.

Figure 40: Locked, hidden and advanced indicators



NOTE: Setting the access rights on an entry, that is, whether it is admin locked and/or admin hidden, can only be performed via the TPS System Programmer when logged in to admin level.

NOTE: If an entry is locked at admin level (or higher), it may only be viewed at user level. If an entry is hidden at admin level, it is not visible at user level. You must log in to admin level to see it.

If the system administrator recognises that there is an entry in one of the menus to which the user requires access, they can use TPS to change the access rights on the entry to make it accessible at user level, or set up a macro and hot key to access the entry.

Related links:

Overview of access rights on page 386
Logging in to admin level on page 146
Adding a macro on page 271

Logging in to admin level

Admin level provides access to:

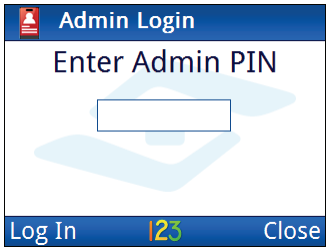
- all user-specific information such as details of channels, scan tables, HF networks, phone links, contacts, peripherals, modes, macros, waypoints, NETs, and messages
- transceiver-specific information that affects how the transceiver performs

When you log in to admin level on the control point, the advanced view of the user interface of the control point is also shown.

NOTE: If you change between user and admin levels frequently, consider assigning the **Toggle Admin Login/Logout** macro to a hot key.

To log in to admin level:

- Press ⌣ until the main menu screen is shown.
- From the main menu, select (**Admin Login**).



- Enter the PIN provided by your system administrator or leave blank if an admin PIN is not used, then press (**Log In**).

Related links:

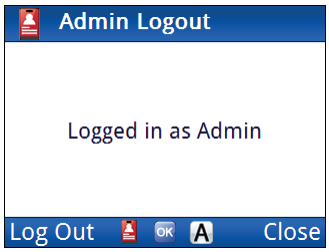
Editing a macro on page 276

Logging out of admin level

Admin level is used for modifying items that are not available at user level.

To log out of admin level:

- Press until the main menu screen is shown.
- From the main menu, select (**Admin Logout**).



- Press (**Log Out**).
- Switch to basic or advanced view, as required.

NOTE: You can also restart the transceiver to return it to user level.

Related links:

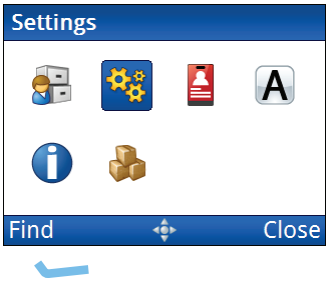
Switching between basic and advanced views on page 144

Finding a word or value

The quickest way to find an entry or a value in the user interface of the control point is to use the **Find** function, which is available via the key when the highlighted icon contains submenus or lists of entries. The feature searches for the sequence of characters (letters, numbers, or a combination of both) that you enter.

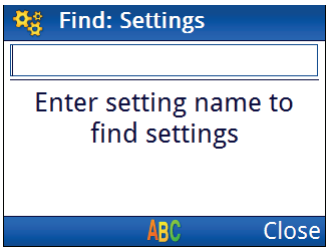
NOTE: The **Find** function only searches on words and values that are visible to the user at the current view and level of access.

Figure 41: Find function



To find a word or value:

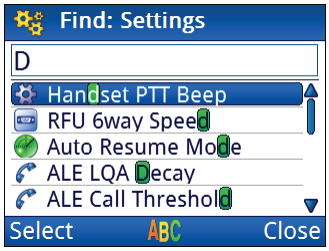
- *Highlight* the icon that represents the highest level in which you want to search, then press (**Find**).



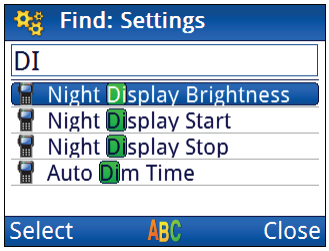
NOTE: If you select the icon by pressing **OK**, you will enter that menu level. If you do not want to search at the lower level, press (**Close**) to return to the higher level, then press (**Find**) again.

- Enter the letter or number on which you want to search.

  Any entries or values that contain the character you have entered are shown in a list, with the character highlighted.

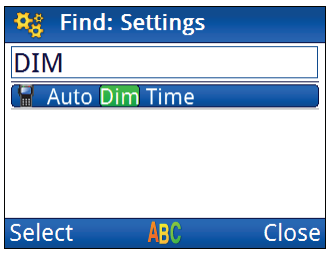


- Enter more characters to refine your search.



The icon that is shown with each item in the list indicates the location of the information. For example, if appears next to the item, then it is located in **Channels**. If there is another item with next to it, then it is located in **HF Networks**.

- Scroll to the entry or value that you want to select.



- Press **OK**.

  You are taken to the entry, or the name level of the user data containing the character.

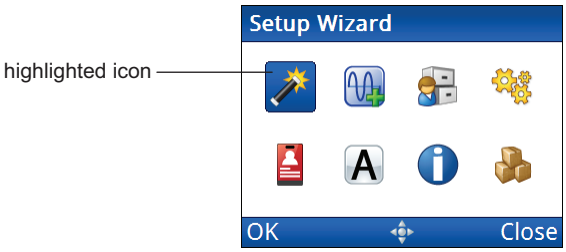
Related links:

Overview of basic and advanced views on page 143
Overview of user and admin levels on page 145
Navigating the menu structure on page 141
Entering text in a field on page 152

Selecting an icon

The top levels of the menu structure are represented by icons. In order to enter the menu represented by the icon, you need to select the icon.

Figure 42: Highlighted icon



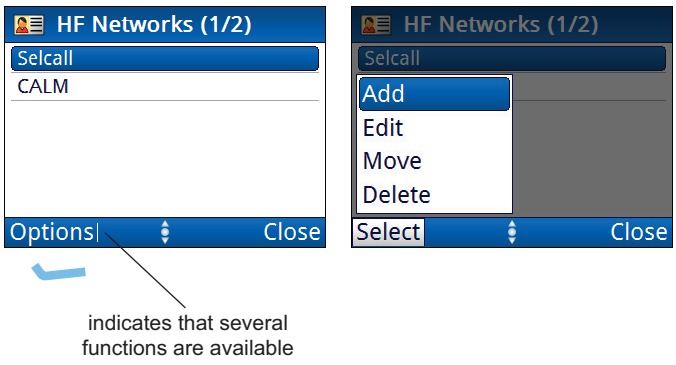
To select an icon:

- Use ◀, ▶, ▲ and ▼ to highlight the icon that you want to select.
- Press **OK** or (**OK**) to select the icon.

Selecting a function from the menu bar

The menu bar at the bottom of the screen provides varying functions, depending on the context. You can select a function directly, or activate a pop-up from the menu bar by pressing the corresponding key (or). A vertical line next to the text indicates that there are a number of choices from which to choose. Typically, you can add, edit, move, delete, save, duplicate, and clear items specific to your current location in the user interface.

Figure 43: Functions on the menu bar



To select a function from the menu bar:

- Press or , corresponding to the function that you want to select.

  If the function in the menu bar does not have a vertical line next to it, the function is performed immediately.

  If the function in the menu bar has a vertical line next to it, a pop-up is shown.

- If a pop-up of available functions is shown:
  - Press ▲ or ▼ to scroll to the function that you want to select.
  - Press (**Select**).

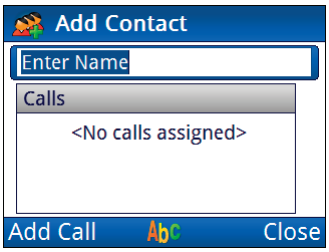
    The function is performed.

- If you want to close the pop-up and not perform any of the functions, press the opposite software key (typically **Close**).

Entering text in a field

You may need to enter text into a field within an entry. This may be a name given to some user data, or it may be a specific value, such as a frequency. When you first enter an editable text field, either by selecting a menu or using the ▲ and ▼ navigation keys, any existing text that you can edit is highlighted. You can use this text, edit this text, or delete this text and enter new text.

Figure 44: Example of an editable text field



To enter text in a field:

- Navigate to a field in which you can edit text.
- If you want to change the input language:
  - *Hold* **#**.
  - Press ▲ or ▼ to scroll to the input language that you want to use, then press **OK**.
  - Press (**Save**).
- Do *one* of the following:
  - To use this text, press ▼.
  - To delete this text, start entering new text.
  - To edit this text, press ▶ to place the cursor at the end of the text.
- Press **#** repeatedly to select the character-entry mode that you want to use.

  The indicator for the character-entry mode is shown in the centre of the menu bar.

  NOTE: The character-entry mode indicators are specific to each language selection.

  NOTE: The input language may be different from the language selected for the user interface.

Figure 45: Character-entry mode indicator

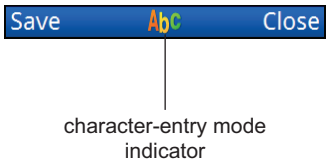


Table 6: Character-entry mode

Character-entry mode	Indicator (English)
All upper-case letters	ABC
All lower-case letters	abc
Sentence-case letters	Abc
Numbers	123

- Do any of the following:
  - Press ◀ or ▶ to move the cursor to the point at which you want to enter text.
  - Press ↵ (on **SCAN** key) to delete text to the left of the cursor.
  - *Hold* ↵ to delete the whole entry.
  - Press the key on the keypad that corresponds to the letter that you want to enter.

    For example, if you want to enter the letter E, press **3** twice.

    After a brief pause, the cursor moves to the next space, ready to enter another character.

    NOTE: If you are in a letter-entry mode and want to enter a number, *hold* the key corresponding to the number that you want to enter.
- Press ▼ to move to the next entry.

Related links:

Saving your changes on page 163

Entering a special character (2220/2230)

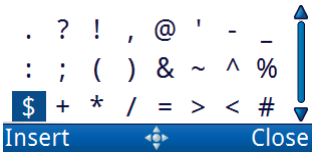
You can enter special characters in messages, names, contacts, and in addresses of stations that you call.

NOTE: If the FED-STD-1045 ALE/CALM option or MIL-STD-188-141B ALE option is installed in your transceiver, the ✱ key may be used to enter the global ALL address syntax (@?@) or special ALE addressing characters easily.

To enter a special character in an address, message or contact:

- Press ◀ or ▶ to move the cursor to the point where you want to insert a special character.
- Press ✱ to cycle through the available choices or *hold* ✱ to see the available special characters.

  Depending on the context, you can select from:



- Press ▲, ▼, ◀ or ▶ to highlight the character that you want to use, then press ⏎ (**Insert**).
- Repeat as required.

Related links:

Entering text with the 2221 Handset on page 155

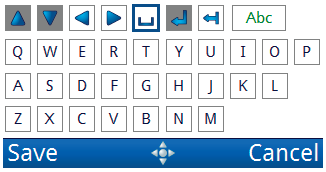
Entering text with the 2221 Handset

The 2221 Handset does not have alphanumeric keys, however, you can still enter text into fields within the user interface.

CAUTION: This process describes how to enter text into an entry field using the virtual keypad, then save the text back to the entry. At this point, the change to the entry itself has not been saved.

To enter text:

- Navigate to an entry in which you can enter text, then press **OK** to see the virtual keypad.



NOTE: The English version is shown, however, virtual keypads exist for other supported languages.

- Press ◀, ▶, ▲ or ▼ to move the highlight to the character that you want to select, then press **OK**.
- If you want to change the input language:
  - Highlight Abc, then *hold* **OK**.
  - Press ▲ or ▼ to scroll to the input language that you want to use, then press **OK**.
  - Press ⌐ (**Save**).
- If you want to change case, enter a number, or enter a special character, scroll to Abc, then press **OK** until you see the character-entry mode that you want to use.
- Continue entering text in this manner.
- Press ⌐ (**Save**) to save the information.

  You are returned to the entry.
- Continue with making changes to the item that you are editing, if required.

Entering text with a USB keyboard

You can also enter text into the fields with a USB keyboard.

To enter text with a USB keyboard:

- Connect the USB keyboard to the control point using a standard USB A (female) to micro USB cable (Codan part number 67-90406).
- Navigate to the field in which you can edit text.
- If you want to change the input language:
  - *Hold* **Ctrl** then press **Shift** to open the **Select Input Language** screen.
  - Press ▲ or ▼ to scroll to the input language that you want to use, then press **Enter**.
  - Press ⌐ (**Save**).
- By default, existing text in the field is highlighted when you enter the field. Do one of the followings:
  - To use this text, press ▼.
  - To delete this text, start entering new text.
  - To edit this text, press ▶ to place the cursor at the end of the text.
- To edit the text, you can do any of the following:
  - Press the arrow keys on the USB keyboard to move the cursor to the point at which you want to enter text.
  - Press **Delete** or **Backspace** keys on the USB keyboard to delete text you don't need.
  - *Hold* **Backspace** key on the USB keyboard to delete the whole entry.
  - Press the key on the USB keyboard that corresponds to the symbol that you want to enter.
- Press ▼ to move to the next entry.

Editing text with a USB keyboard

The user interface of the control point provides basic text editing functions for the USB keyboard, including selecting, copying, cutting and pasting text.

To edit the text in a field:

- Press the arrow keys on your keyboard to place the cursor at the beginning of the text you want to copy or cut.
- *Hold* the **Shift** on the USB keyboard and then press the arrow keys to select the text.

  NOTE: To select all the text in the field, *Hold* **Ctrl** and press **A**
- Do *one* of the following:
  - If you want the copy the selected text, *Hold* **Ctrl** and press **C**.
  - If you want to cut the select text, *Hold* **Ctrl** and press **X**.
- Press the arrow keys on your keyboard to place the cursor at the place where you want to paste the text.
- *Hold* **Ctrl** and press **V** to paste the text.

Table 7: USB Keyboard special keys

Key	Function
F1	(Left software key)
F2	(Right software key)
F3	**CALL** key
F4	**SCAN** key
Space	When in editing mode, inserts a space When not in editing mode, acts as the **PTT** button
Ctrl + A	Selects all text in the focused field
Ctrl + C	Copies the selected text
Ctrl + X	Cuts the selected text
Ctrl + V	Pastes the copied text
Ctrl + Y	Redo
Ctrl + Z	Undo
Ctrl + Enter	Inserts a newline if allowed
Ctrl + Shift	Opens the Select Language Screen when applicable
Alt + *	Opens the special characters popup when applicable

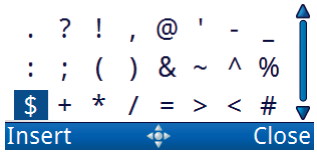
Entering a special character with a USB keyboard

Normal USB keyboards have dedicated keys for the commonly used special characters. The user interface of the control point allows more special characters.

To enter a special character that's not available on the USB keyboard:

- Press **Alt** then press the ***** key on your keyboard to see the available special characters.

  Depending on the context, you can select from:

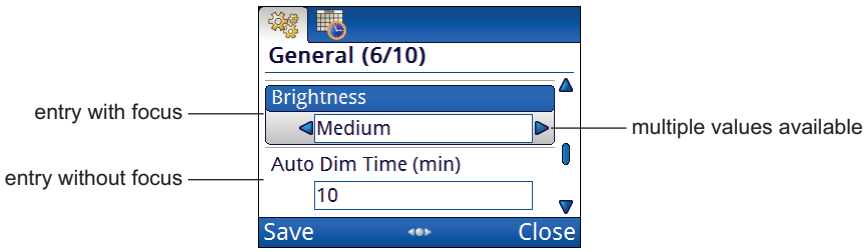


- Press the arrow keys on your keyboard to highlight the character that you want to use, then press **Enter** key to insert.
- Repeat as required.

Selecting a value from a list

When you select an entry that has a list of values, either by selecting an icon or using the ▲ and ▼ navigation keys, the field is highlighted to show that it can be edited, and ◀/▶ indicators appear on one or both sides of the field to show that multiple values are available.

Figure 46: List of entries, with and without focus



To select a value from a list:

- Navigate to an entry in which you can select a value.
- Press ◀ or ▶ to select the value that you want to use.
- Press ▼ to move to the next entry.

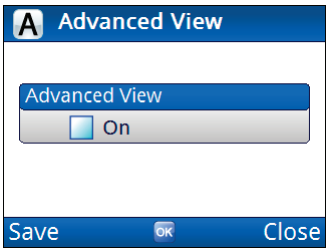
Related links:

Entering text in a field on page 152
Saving your changes on page 163

Selecting/deselecting a check box

There are some entries in the menu structure that require you to enable or disable a particular feature via a check box.

Figure 47: Entry with a check box



To select or deselect a check box:

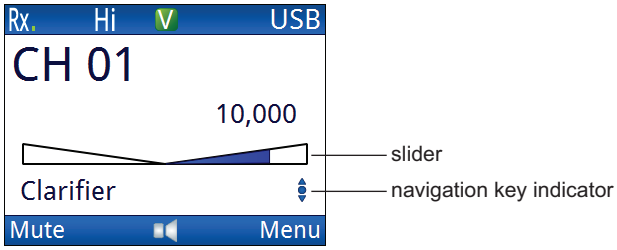
- Highlight the entry.
- Press **OK** to toggle the check box as selected or deselected.

  When the check box is selected, the item is enabled. When the check box is clear, the item is disabled.
- Press (**Save**) to save the information.

Moving a slider

Some values in the user interface of the control point are represented by a slider.

Figure 48: A slider value



To move a slider:

- Press any of the navigation keys suggested in the navigation key indicator to adjust the slider.

Changing the order of items in a list

In some areas of the user interface of the control point, you are able to change the order in which items appear in a list, which impacts how the item is viewed, or when each item may be used. For example, you may change the order in which the channels, scan tables, HF networks, contacts, phone links, and NETs are listed so that you don't have to scroll to the item to select it. In areas where the order is important, such as NET members, you can move the items into the preferred response order.

To change the order of items in a list:

- Highlight the item that you want to move.
- Press ⌐ (**Options**), scroll to **Move**, then press ⌐ (**Select**).
- Press ▲ or ▼ to move the item to the new position in the list, then press ⌐ (**Place**).

Saving your changes

When information in an item has been changed, either by editing existing text or selecting a different value from a list, an asterisk is added to the title of the screen.

Figure 49: Screen that has changes to be saved

To save changes:

- Do *one* of the following:
  - Press (**Save**).
  - Press (**Options**), scroll to **Save**, then press (**Select**).
- If you do not want to save the changes, do *one* of the following:
  - Press (**Close**), then press (**Yes**) to discard the changes.
  - Press PTT to exit to the channel/scanning screen without saving changes.

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5 Structure of information

This section contains the following topics:

Structure of user information

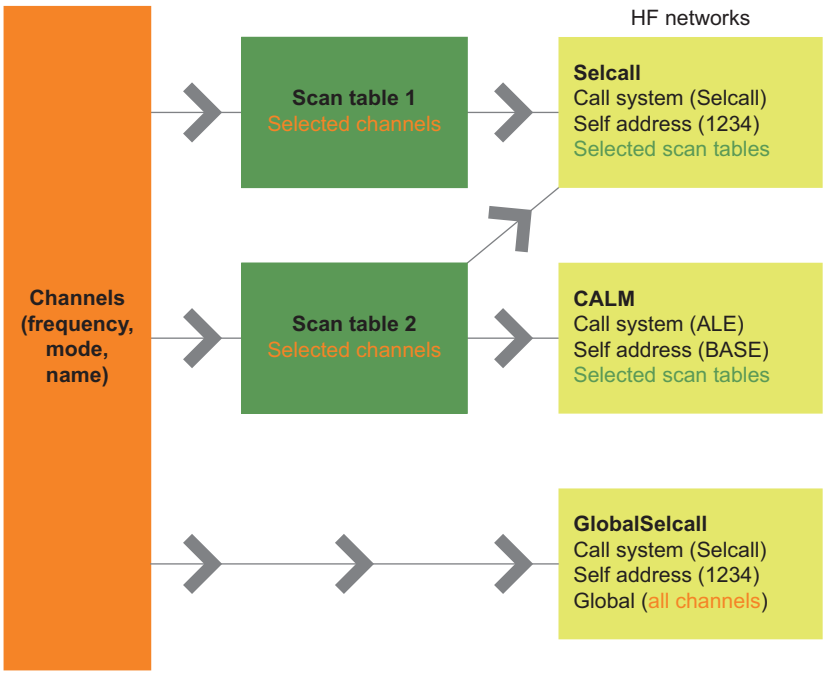
Information in the Envoy transceiver is stored like blocks in a building. Basic blocks are populated with information first, then these blocks, along with different blocks, are assembled into larger blocks. Ultimately, one of the top-level blocks is used to make a call.

The most basic block is a frequency. A frequency is combined with a mode, say USB or LSB, and a name to become a channel. Channels may be grouped into scan tables. Scan tables may be allocated to HF networks. An HF network defines the call system by which a call is made and the self address of the transceiver.

Further blocks may be assembled for the convenience of the user. A contact stores information on the typical calls that can be made to a person or organisation. Each call is defined by the HF network and the call type.

How these blocks are assembled is up to the system administrator. There is, of course, finer detail that needs to be included, however, the basic structure of information in the transceiver is shown in Figure 50.

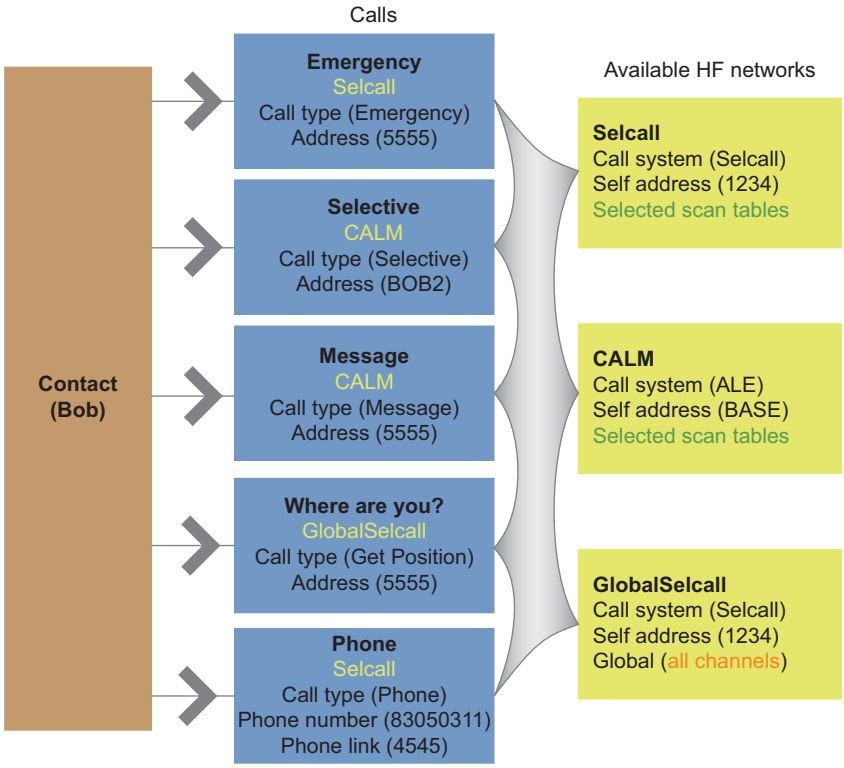
Figure 50: Basic structure of information in the Envoy transceiver



Structure of contact and call information

A contact holds information on calls that you make to a particular person or organisation. You may have several methods of calling the same contact. Each method that you use is bundled into a call for that contact. The basic building blocks that you require to define a call to a contact is the HF network that will be used, the type of call that you want to make, and the address or telephone number at which the person or organisation will answer the call. The basic structure of call information in a contact is shown in Figure 51.

Figure 51: Structure of call information for a contact in the Envoy transceiver



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6 Channels

This section contains the following topics:

Overview of channels

A channel is a pair of frequencies that is programmed in the transceiver and used to transmit and receive signals on air. A channel has a name, a receive frequency, a transmit frequency, a mode, the preferred mode, up to four optional groups, a power level, and an antenna. Depending upon your requirements, the transmit frequency may be inhibited, and you will only be able receive signals on the channel.

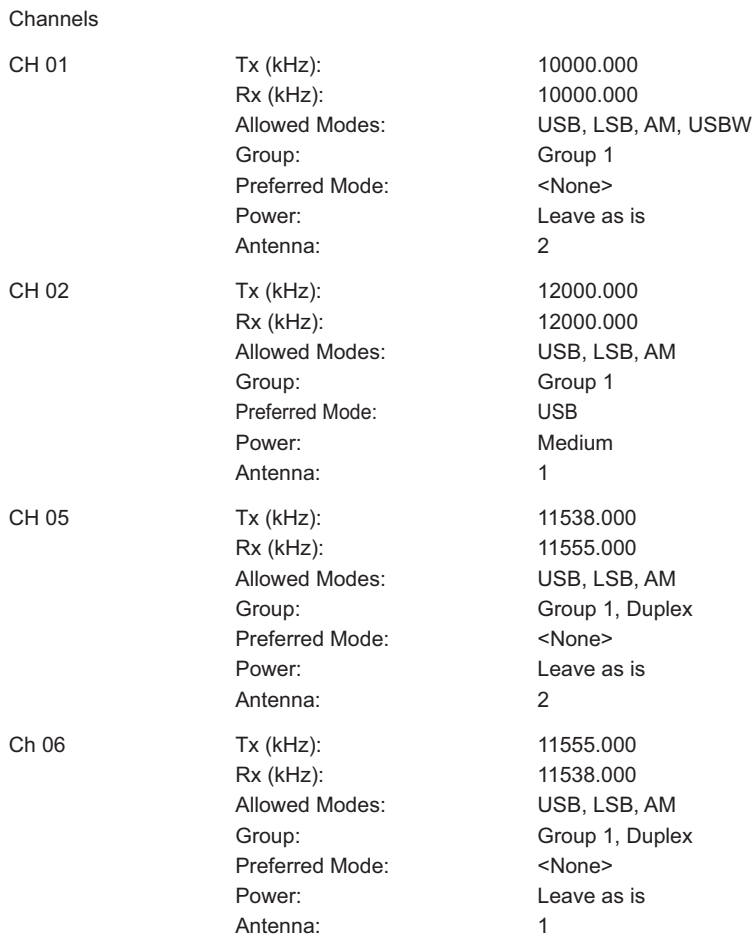
You must enter the details of at least one channel before you can make or receive a call. A channel must have a transmit frequency if you want to use it to make a call.

Each channel has one or more modes associated with it. Each mode indicates a sideband that can be used with the channel, such as USB or LSB. When you make a call you must specify the channel and the mode that you want to use.

Groups are created in TPS System Programmer, and allocated to channels via TPS or via the user interface on the control point. You can use the Tool Box in TPS to create and apply a group to a number of channels at the same time. Once a group has been created in TPS and programmed via a profile to the transceiver, it may be allocated within the profile to other channels.

Figure 52 shows the information that is stored for a channel. Each item is described in detail in the sections following.

Figure 52: Information for a channel



Related links:

Entries for a channel on page 172
Adding a channel on page 177
Available modes on page 259

Entries for a channel

NOTE: If you are entering text into a field in the control point, you may use characters from any of the supported languages.

Channel name

The channel name is a label, in any supported language, that is given to a frequency, or pair of frequencies, that is used to receive and/or transmit HF radio signals.

A channel name can consist of letters, numbers, or a combination of both. A channel has a name that uniquely identifies it, and makes it available for selection in other areas of the user interface of the control point.

NOTE: If you are using a Dual Antenna Adaptor, you may like to include the antenna selection for a channel into the name of the channel, for example, **Ch 1 A1** and **Ch 1 A2**.

CAUTION: You should be aware of any restrictions placed on channel names in your transceiver when it is used with a Codan HF data modem, radio/telephone interconnect, or InterNav© software. See the documentation provided with this equipment.

Frequency

The receive and transmit frequencies may be any frequencies within the HF range, however, the transmit frequencies can only be those allocated to you by the relevant government authority in your country.

Spectral regulations may require the TxD option to be installed in the transceiver. In this case, you cannot add channels with new transmit frequencies. You can, however, add receive-only channels, and channels with the same transmit frequency as an existing channel. If the TxP option is installed in the transceiver, you cannot add channels.

Related links:

General specifications on page 518

Transmit frequency

A transmit frequency carries modulated information that is sent to a remote transceiver. The frequency is entered in kHz.

Receive frequency

A receive frequency carries modulated information that is received from a remote transceiver. The frequency is entered in kHz.

Modes

Modes are available in the transceiver when a particular filter is enabled. When the standard IF filter is enabled, the available modes are USB and LSB. If a different filter is enabled, other modes are available. For example, if you have a wide IF filter enabled, USBW and LSBW are available. If you have a narrow Morse filter enabled, UMCW and LMCW are available.

You can select any or all of the available modes as the allowed modes for a particular channel. You select the preferred mode from the allowed modes for a particular channel.

NOTE: Transceivers that are ISB-capable scan in the upper sideband of the frequency, and use this sideband for voice and message-type calls, establishing calls, and preambles. Any calls that are made to ISB-capable transceivers from transceivers that do not support ISB transmissions must be made on the frequency using the USB mode.

Related links:

Modes on page 257

Preferred mode

The optional preferred mode is the mode that the transceiver uses by default when this channel is selected. The preferred mode is selected from the list of allowed modes for the channel.

Group

Channel groups are used to organise your channels in the same way as a folder on a computer allows you to organise your files. The groups reduce the number of items over which you have to scroll in the channel screen.

If you have **Settings** > **Control Point** > **General** > **Channel Grouping** set to **Enabled** and you assign your channels to a group, you can scroll to the channel group that you want, press **#**, then scroll to the channel in this group that you want. You can select that the current channel group be shown in a status area.

Channel groups may only be defined in the profile using TPS System Programmer. If a channel is added via the control point to a profile that has channel groups allocated to existing channels, you can allocate the channel to a channel group. You can allocate up to 4 groups per channel.

Related links:

Channel Grouping on page 309
Steps on page 269
Selecting information to be shown in a status area on page 31

Power

The **Power** entry sets the power level for transmission when this channel is selected. The actual value that may be selected for each range is set up in the **Low Power**, **Medium Power** and **High Power** entries in **Settings** > **Configuration**.

If you want the transceiver to transmit signals on this channel:

- at the power level set in the **Tx Power** entry, select **Leave as is**
- at the value set for the low power range, select **Low**
- at the value set for the medium power range, select **Medium**
- at the value set for the high power range, select **High**
- with the external power amplifier, select **PA**

Related links:

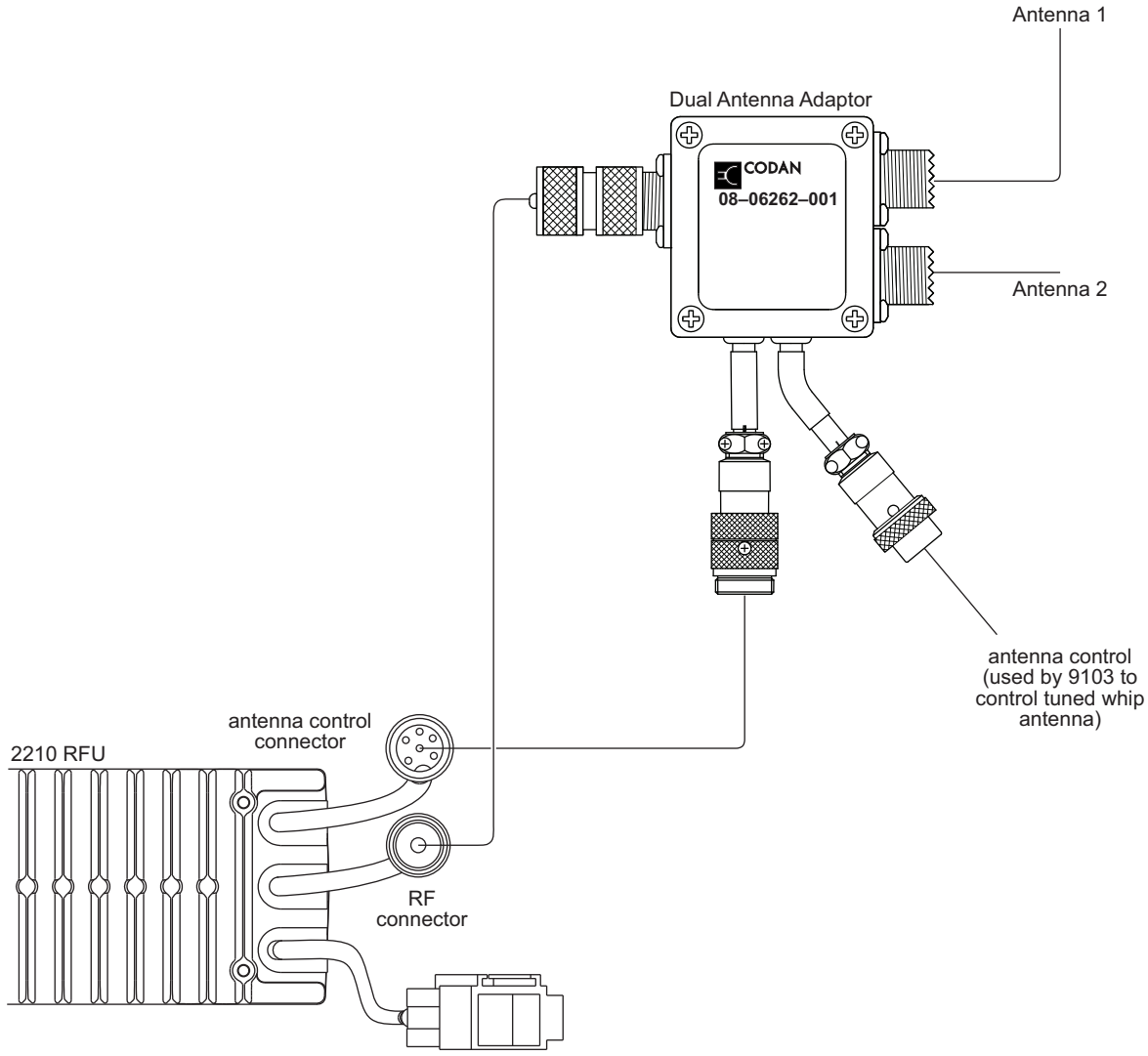
Low Power on page 331
Medium Power on page 331
High Power on page 331

Antenna

The **Antenna** entry sets the antenna that is used with this channel when a Dual Antenna Adaptor is attached to the transceiver at the fixed base station. The Dual Antenna Adaptor may be used with two broadband antennas, or a broadband antenna and a 9103 tuner with a tunable antenna in either position. If both antennas are broadband antennas, select **User Data** > **Peripherals** > **Antenna Type** > **Broadband**. If one of the antennas is a tunable antenna with a 9103 tuner, select **User Data** > **Peripherals** > **Antenna Type** > **9103**.

A possible scenario for setting up channels is to have two identical frequencies, with either **1** or **2** selected for the antenna, then name the channels to reflect the antenna selection, for example, **Ch 1 A1** and **Ch 1 A2**.

Figure 53: Connection diagram for dual antennas



If you want the transceiver to use:

- antenna 1 when the channel is selected, select **1**
- antenna 2 when the channel is selected, select **2**

When the transceiver starts scanning, it selects the antenna that it uses according to the following:

- If all scanned channels have the antenna set to **1**, the transceiver uses antenna 1.
- If all scanned channels have the antenna set to **2**, the transceiver uses antenna 2.
- If at least one of the scanned channels has the antenna set to **1**, the transceiver uses antenna 1.

CAUTION: LQA information for channels that use the non-preferred antenna may not be accurate.

When the transceiver is free tuning, it uses the currently selected antenna.

NOTE: You can setup a macro to perform the "Toggle Antenna" action, and use it to toggle the currently selected antenna.

Related links:

Creating a macro to perform an action on page 280

Working with channels

Related links:

Entries for a channel on page 172
Overview of scan tables on page 182
Available modes on page 259
Tx Power on page 330
Navigating the menu structure on page 141
Entering text in a field on page 152
Selecting a value from a list on page 159
Saving your changes on page 163
Adding a channel in free tune on page 479

Adding a channel

Stations in an HF communication network use the information contained within a channel to transmit and receive signals. Common channel information must be programmed into transceivers that want to communicate with each other. Typically, these channels are grouped into scan tables, which are allocated to an HF network.

NOTE: If you are operating the transceiver in a country that has stringent licensing regulations, you may not be permitted to add channels with transmit frequencies.

NOTE: If the TxD option is installed in the transceiver, there are restrictions on the frequencies that you can enter.

NOTE: If the TxP option is installed in the transceiver, you cannot add channels.

NOTE: You may be permitted to add a channel in free tune.

NOTE: To view all of the available entries, log in to admin level and switch to advanced view.

To add a channel:

- From the main menu, select (**User Data**), then (**Channels**).
- Do *one* of the following:
  - If there are no channels programmed in the transceiver, press (**Add**).
  - If there are some existing channels programmed in the transceiver, scroll to the channel after which you want to add the new channel, press (**Options**), scroll to **Add**, then press (**Select**) to add a channel.

    NOTE: The transceiver automatically generates a sequential channel name based on the selected channel. If no channel is selected, the transceiver uses the next available **CH xx**. All information, except frequencies, is copied to the new channel.
- Enter the name that you want to use for the channel.

- Press ▼ to move to the **Tx** entry.
- Enter the transmit frequency that you want to use for this channel (in kHz, with up to three decimal points or 1 Hz resolution).
- Press ▼ to move to the **Rx** entry.

  The **Rx** entry is automatically filled with the transmit frequency.
- Enter the receive frequency (in kHz, with up to three decimal points or 1 Hz resolution), if required to be different from the Tx frequency.
- Press ▼ to move to the **Mode** entry.
- To select a mode:
  - Press ▶ to view the list of available modes.
  - Press ▲ or ▼ to scroll to the mode that you want to use, then press **OK**.

    When the check box is selected, the item is enabled. When the check box is clear, the item is disabled.
  - Select other modes, as required.

    NOTE: The modes that you select become the allowed modes for this channel. In a scan table, you can duplicate a channel and select another of the allowed modes.
  - Press ⌐ (**Save**).
- Press ▼ to move to the **Preferred Mode** entry.
- Press ◀ or ▶ to select the mode that you want to use.
- Press ▼ to move to the **Power** entry.
- Press ◀ or ▶ to select the value that you want to use from the following:
  - To transmit at the power level set in the **Tx Power** entry, select **Leave as is**.
  - To transmit signals at the value set for the low power range, select **Low**.
  - To transmit signals at the value set for the medium power range, select **Medium**.
  - To transmit signals at the value set for the high power range, select **High**.
- Press ▼ to move to the **Antenna** entry.

  NOTE: The **Antenna** entry is used to select one of two antennas when the Dual Antenna Adaptor is connected to the transceiver.
- Press ◀ or ▶ to select the value that you want to use from the following:
  - To assign antenna 1 to this channel, select **1**.
  - To assign antenna 2 to this channel, select **2**.

    NOTE: The actual antenna that is used during scanning is antenna 1 by default, however, this may be changed depending on how the antennas are assigned to the scanned channels.

- If you want to review the information that you have entered, press ▲ or ▼ to move through the entries.
- Press (**Save**) to save the information.
- Press (**Close**).

Related links:

Antenna on page 174

Editing a channel

Editing a channel is similar to adding a channel.

To edit a channel:

- From the main menu, select (**User Data**), then (**Channels**).
- Press ▲ or ▼ to scroll to the channel that you want to edit, then press **OK**.
- Continue with the process for adding a channel.

Related links:

Adding a channel on page 177

Moving a channel

Channels appear in the list in the order in which they are created. You can move a channel to a different rank in the list to suit your needs, for example, you may want to place a channel that you use frequently at the top of the list.

To move a channel:

- From the main menu, select (**User Data**), then (**Channels**).
- Press ▲ or ▼ to scroll to the channel that you want to move, press (**Options**), scroll to **Move**, then press (**Select**).
- Press ▲ or ▼ to scroll to the new location for the channel in the list, then press (**Place**).
- Press (**Close**).

Deleting a channel

To delete a channel:

- From the main menu, select (**User Data**), then (**Channels**).
- Press ▲ or ▼ to scroll to the channel that you want to delete, press (**Options**), scroll to **Delete**, then press (**Select**) to delete the channel.
- Press (**Close**).

7 Scan tables

This section contains the following topics:

Overview of scan tables

A scan table contains channels that are programmed in a transceiver. Any settings that are applied to the scan table act upon all channels in the scan table. The number of scan tables that you can add in your transceiver varies depending on the transceiver type and options installed, however, only 100 channels may be scanned at any one time.

NOTE: You will receive a pop-up to notify you if you select more than 100 channels for scanning.

Each scan table has a name, a scan on/off switch, a voice detect on/off switch, a channel dwell time, and a data detect on/off switch.

The same channel may be included in one or more scan tables. One or more scan tables may be allocated to an HF network. The same scan table may be allocated to different HF networks.

NOTE: The default channel dwell time for a Selcall HF network is 0.25 sec/channel. The default channel dwell time for an ALE/CALM HF network is 0.125 sec/channel.

NOTE: If the channels are scanned for voice, the channel dwell time defaults to 0.55 sec/channel regardless of the type of HF network. If you are using the 2.4 kbit/s Data Modem or 3012 compatibility mode in other modems in a scanning Selcall system, the channels *must* be scanned for data. In this case, the channel dwell time defaults to 0.6 sec/channel regardless of the type of HF network.

In order for a channel to be scanned, the following must occur:

- the channel must be included in a scan table
- the scan table must be set up to be scanned
- the transceiver must have scanning switched on

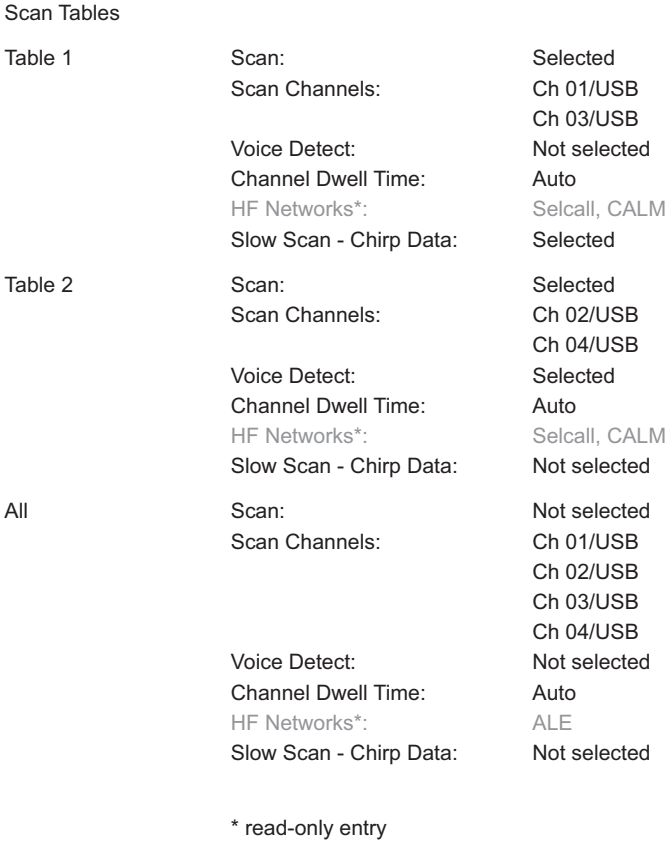
If the **Global** value is selected for an HF network, then all channels programmed in the transceiver are scanned when the transceiver is scanning, regardless of any scan tables.

When a transceiver is scanning, it is listening for a voice/data signal, a preamble signal, or both. The transceiver listens for a pre-determined dwell time on each channel. If it detects a preamble signal, it waits to hear the address of the station to which the call is addressed. If the address sent matches one of the self addresses of the listening station, it switches off scanning and mute (if they are not already switched off).

It is recommended that scanning is switched on when you are not using the transceiver to communicate. This ensures that you can receive calls from stations using the channels that your transceiver is scanning.

Figure 54 shows the information that is stored for a scan table. Each item is described in detail in the sections following.

Figure 54: Information for a scan table



Related links:

Overview of channels on page 170
Channel dwell time on page 184
Overview of HF networks on page 194
Adding a scan table on page 187
Scan Mute on page 338
Global on page 198

Entries for a scan table

NOTE: If you are entering text into a field in the control point, you may use characters from any of the supported languages.

Scan table name

A scan table has a name that uniquely identifies it, and makes it available for selection in other areas of the user interface of the control point.

Scanning a scan table

You can include channels in a scan table and set up some common properties for how these channels are scanned. One of these properties is whether these channels are scanned or not.

You can enable or disable scanning for any scan table. If enabled, the scan table is scanned when scanning is switched on. You can also set the transceiver to scan the channels for voice and/or data, which increases the dwell time on each channel.

Related links:

Scan Mute on page 338
Voice detect on page 184
Slow Scan - Chirp Data on page 186

Scan channels

The **Scan Channels** entry contains the channels that you want to use together under the same scanning conditions. The name, frequencies and mode of each channel that you want to scan are stored in the **Scan Channels** entry.

Voice detect

The **Voice Detect** entry sets whether or not the channels in the scan table are scanned for voice. If you enable voice detection, the time that a transceiver dwells on a channel defaults to 550 msec.

Channel dwell time

The channel dwell time is the length of time during scanning that the transceiver pauses on each channel in order to detect an incoming call. This duration can be specified (in seconds) according to the requirements of your station and the stations with which you communicate, or you can set it to **Auto**. When it is set to **Auto**, the transceiver calculates the channel dwell time according to the HF networks (call system) in which the scan table is used. The maximum value of the channel dwell time, regardless of the call system, is 10 sec.

Table 8: Default channel dwell time for each type of HF network or detection requirement

HF network type	Detection requirement	Default channel dwell time (msec)
Codan Selcall	None selected	250
	Voice	550
	Data	600
Open Selcall	None selected	250
	Voice	550
	Data	600
ALE/CALM	None selected	125
	Voice	550
	Data	600

NOTE: If you change the channel dwell time from **Auto** and/or change the number of channels in the scan table, you must recalculate the duration of the preamble, that is, the channel dwell time multiplied by the number of channels in the scan table(s) allocated to the HF network.

NOTE: You cannot set a channel dwell time that is lower than the default value.

Related links:

Preamble length on page 199

HF network

The **HF Network** entry in a scan table is read only. It shows the HF networks in which the scan table is used. This entry is populated when the scan tables are allocated to the HF network.

Slow Scan - Chirp Data

NOTE: The **Slow Scan - Chirp Data** entry should be set when using the 2.4 kbit/s Data Modem or any external modem in a scanning Selcall system.

NOTE: The **Slow Scan - Chirp Data** entry *should not* be set when using ALE/CALM systems to establish a link between two modems via any third-party HF email software.

The **Slow Scan - Chirp Data** entry sets whether or not scanning is slowed to a value suitable for a 3012-type modem to detect the CHIRP calling signal from another 3012-type modem, stop scanning, and initiate the link. If you enable this signal detection, the time that a transceiver dwells on a channel defaults to 600 msec.

Working with scan tables

Related links:

Entries for a scan table on page 184
Overview of HF networks on page 194
Scan channels on page 184
Navigating the menu structure on page 141
Entering text in a field on page 152
Selecting a value from a list on page 159
Selecting/deselecting a check box on page 160
Saving your changes on page 163

Adding a scan table

A scan table contains a list of the channels and modes that you want to scan, and a set of conditions under which these channels are scanned.

NOTE: To view all of the available entries, switch to advanced view.

To add a scan table:

- From the main menu, select (**User Data**), then (**Scan Tables**).
- Do *one* of the following:
  - If there are no scan tables programmed in the transceiver, press (**Add**).
  - If there are some existing scan tables programmed in the transceiver, scroll to the scan table after which you want to add the new scan table, press (**Options**), scroll to **Add**, then press (**Select**) to add a scan table.
- Enter the name that you want to use for the scan table.
- Press to move to the **Scan** entry.
- If you want the scan table to be scanned, press **OK** to select the **On** check box.
- Press to move to the **Scan Channels** entry.
- To add channels to the scan table:
  - Press to view the list of available channels.
  - Press or to scroll to the channel that you want to add, then press **OK**.
  - Press or to select the mode that you want to use.
  - Select other channels, as required.
  - Press (**Save**) to add these channels to the scan table.

  The amount of time that the transceiver spends scanning this table is shown in the title of the **Scan Channels** entry, for example, **Scan Channels (1 sec)**.

- Press ▼ to move to the **Voice Detect** entry.
- If you want the channels in the scan table to be scanned for voice signals regardless of the types of HF networks to which this scan table is allocated, press **OK** to select the **On** check box.
- Press ▼ to move to the **Channel Dwell Time** entry.
- To change the channel dwell time from the **Auto** value for the HF networks allocated to the scan table:
  - Press ▶ repeatedly to increment the dwell time per channel by 25 msec, up to a maximum of 10 sec per channel.
  - Press ◀ and ▶ to move the cursor to a specific digit, then enter a number via the keypad, if required.
- Press ▼ to move to the **HF Networks** entry.

  The **HF Networks** entry is read-only. It shows in which HF networks this scan table has been allocated.
- Press ▼ to move to the **Slow Scan - Chirp Data** entry.
- If you want the channels in this scan table to be scanned for data signals in scanning Selcall systems that use a 3012-compatible HF data modem, press **OK** to select the **On** check box.
- If you want to review the information that you have entered, press ▲ or ▼ to move through the entries.
- Press ⌐ (**Save**) to save the information.
- Press ⌐ (**Close**).

Adding channels to a scan table

When you are adding or editing a scan table, you may want to add extra scan channels to those already in the scan table. When you use the **Add Chan** option, you view a list of the channels in the transceiver that have not yet been added to the scan table that you are currently viewing. You may also duplicate a channel. If the same mode is used for this duplicate, then the dwell time for this channel is doubled. Alternatively, you can select a different allowed mode for this channel.

NOTE: If you have the ISB option enabled and you intend to use a channel for high-speed 2G data, you must select the ISB mode for the channel that you want to use.

To add channels to a scan table:

- From the main menu, select (**User Data**), then (**Scan Tables**).
- Press ▲ or ▼ to scroll to the scan table in which you want to add a channel, then press **OK**.
- Press ▼ to move to the **Scan Channels** entry.

- Press ▶ to view the list of channels that are already added to the scan table.
- Press (**Options**), scroll to **Add Chan**, then press (**Select**).
- Press ▲ or ▼ to scroll to the channel that you want to use, then press **OK**.
- Press ◀ or ▶ to select the mode that you want to use.
- Press (**Save**).
- Press (**Options**), scroll to **Save**, then press (**Select**).
- Press (**Close**).

Related links:

Duplicating a channel in a scan table on page 190

Deleting a channel from a scan table

When you are adding or editing a scan table, you may want to delete channels that you have added to the scan table. When you use the **Delete** option, the channel is only removed from the scan table. It is not deleted from the transceiver. The channel that you remove from the scan table will be available for adding back into this scan table using the **Add Chan** option.

To delete a channel from a scan table:

- From the main menu, select (**User Data**), then (**Scan Tables**).
- Press ▲ or ▼ to scroll to the scan table from which you want to delete a channel, then press **OK**.
- Press ▼ to move to the **Scan Channels** entry.
- Press ▶ to view the list of channels in the scan table.
- Press ▲ or ▼ to scroll to the channel that you want to delete from the scan table.
- Press (**Options**), scroll to **Delete**, then press (**Select**).
- Press (**Options**), scroll to **Save**, then press (**Select**).
- Press (**Save**) to save the information.
- Press (**Close**).

Related links:

Adding channels to a scan table on page 188
Clearing the channels from a scan table on page 190

Duplicating a channel in a scan table

If a channel has more than one allowed mode, you can select the mode that is scanned when you add the channel to the scan table. If you want to have all allowed modes for the channel scanned, duplicate the channel and select a *different* allowed mode. Duplicating a channel and using the *same* mode doubles the length of time per scan cycle that the channel is scanned. The transceiver automatically scans these two instances of the same channel/mode together.

To duplicate a channel:

- From the main menu, select (**User Data**), then (**Scan Tables**).
- Press ▲ or ▼ to scroll to the scan table in which you want to duplicate a channel, then press **OK**.
- Press ▼ to move to the **Scan Channels** entry.
- Press ▶ to view the list of channels in the scan table.
- Press ▲ or ▼ to scroll to the channel that you want to duplicate.
- Press (**Options**), scroll to **Duplicate**, then press (**Select**).

  The duplicate channel is highlighted. If there is more than one allowed mode for the channel, ◀/▶ indicators appear on both sides of the mode field.
- Press ◀ or ▶ to select a different mode for the channel, if required.
- Press (**Options**), scroll to **Save**, then press (**Select**).
- Press (**Options**), scroll to **Save**, then press (**Select**).
- Press (**Close**).

Related links:

Adding a channel on page 177

Clearing the channels from a scan table

Clearing channels from a scan table is a quick way of removing all channels from the list of scanned channels. It is the same as deleting channels from a scan table, except that all of the channels are removed in one action. The channels that are cleared from the scan table are not deleted from the transceiver. The channels that you clear from the scan table will be available for adding back into this scan table using the **Add Chan** option.

To clear the channels from a scan table:

- From the main menu, select (**User Data**), then (**Scan Tables**).
- Press ▼ to scroll to the scan table from which you want to clear all channels, then press **OK**.
- Press ▼ to move to the **Scan Channels** entry.

- Press ▶ to view the list of channels in the scan table.
- Press (**Options**), scroll to **Clear**, then press (**Select**).
- Press (**Options**), scroll to **Save**, then press (**Select**).
- Press (**Options**), scroll to **Save**, then press (**Select**).
- Press (**Close**).

Related links:

Adding channels to a scan table on page 188

Editing a scan table

Editing a scan table is similar to adding a scan table.

To edit a scan table:

- From the main menu, select (**User Data**), then (**Scan Tables**).
- Press ▲ or ▼ to scroll to the scan table that you want to edit, then press **OK**.
- Continue with the process for adding a scan table.

Related links:

Adding a scan table on page 187

Moving a scan table

To move a scan table:

- From the main menu, select (**User Data**), then (**Scan Tables**).
- Press ▲ or ▼ to scroll to the scan table that you want to move, press (**Options**), scroll to **Move**, then press (**Select**).
- Press ▲ or ▼ to scroll to the new location for the scan table in the list, then press (**Place**).
- Press (**Close**).

Deleting a scan table

To delete a scan table:

- From the main menu, select (**User Data**), then (**Scan Tables**).

- Press ▲ or ▼ to scroll to the scan table that you want to delete, press (**Options**), scroll to **Delete**, then press (**Select**) to delete the scan table.
- Press (**Close**).

8 HF networks

This section contains the following topics:

Overview of HF networks

An HF network is two or more stations that use common channel/mode combinations and call system to communicate. This simplifies communication because each station knows the method with which they can make and scan for incoming calls, and the frequencies they can use. To access information about the HF networks programmed in the transceiver, navigate to **User Data** > **HF Networks**.

HF networks are based on call systems. A call system is a method of making and receiving calls. For example, if you are in an HF network that uses the Codan Selcall or Open Selcall call system, you make calls by entering the address of the station that you want to call, then selecting the channel/mode that you want to use. When your call is detected by the called station, that station rings to alert the operator. In an ALE/CALM HF network, you make calls by entering the address of the station that you want to call. The transceiver selects the best channel on which to make the call.

When you add an HF network, you must select the call system that you want to use and enter the self address. You can then enter further information based on your selection.

NOTE: The call systems from which you can select depend on the options installed in the transceiver.

If you have an encryptor installed and enabled, and you are using an ALE/CALM HF network, you can set up the secure behaviour for calls made and received via this HF network.

The transceiver can be set to scan the scan tables associated with your HF network to detect incoming calls. It is recommended that scanning is switched on when you are not using the transceiver to communicate. This ensures that you can receive calls from stations in your HF radio communication network.

Figure 55 shows the information that is stored for an HF network. Each item is described in detail in the sections following.

Figure 55: Information for an HF network

HF Networks		
Selcall	Call System:	Codan Selcall
	Selcall Self Address:	1111
	Scan Tables:	Table 1
	Additional Self Addresses:	1122
		1133
	Global:	Not selected
	Preamble Length:	Auto
	Send Preamble:	Always
	Privacy Mode:	None
	Privacy Password:	<Empty>
	Rx Only:	Not selected
CALM	Call System:	ALE/CALM
	ALE Self Address:	BASE1
	Scan Tables:	Table 1, Table 2
	Additional Self Addresses:	BASE2
		BASE3
		BASE4
	Global:	Selected
	Preamble Length:	Auto
	Send Preamble:	Always
	Sounding Interval:	Enabled
	Privacy Mode:	Group
	Privacy Password:	*****
	Secure State:	Secure on
	Rx Only:	Not selected

Related links:

Entries for an HF network on page 196
Adding an HF network on page 203

Entries for an HF network

NOTE: If you are entering text into a field in the control point, you may use characters from any of the supported languages.

HF network name

An HF network has a name that uniquely identifies it, and makes it available for selection in other areas of the user interface of the control point.

Call system

A call systemapplies to all types of HF networks. It is the method used by the HF network to make and receive calls, for example, Codan Selcall, Open Selcall, or ALE/CALM. The call systems from which you can select depend on the options installed in the transceiver.

If your HF network uses the Codan Selcall or Open Selcall call system, you can make calls by selecting an appropriate channel/mode then entering the address of the station that you want to call as part of the calling process. When your call is detected by that station, that station rings to alert the operator. If your HF network uses the ALE/CALM call system, the transceiver can select the best channel/mode for you.

A Codan Selcall HF network can receive calls sent from a transceiver using the Open Selcall protocol. If you want to be able to make calls to transceivers that use the Open Selcall protocol, you must set up an Open Selcall HF network to use with these calls.

CAUTION: You should be aware of any restrictions placed on HF network names in your transceiver when it is used with a Codan HF data modem, a radio/telephone interconnect, UUPlus©/Codan Chat© software, or InterNav© software.

CAUTION: Any station that is tuned to your frequency and has mute switched off can listen to your voice conversation, unless you are using one of Codan's encryptors.

FED-STD-1045 ALE/CALM

If you want to use the ALE/CALM call system to automate the selection of channels, you must install the FED-STD-1045 ALE/CALM option in the transceiver.

The FED-STD-1045 ALE/CALM option enables the transceiver to test the signal propagation qualities of your channels using soundings, and build a profile of each channel's suitability for use at different times of the day and night. The BER and SINAD information collected during sounding activity is stored in the transceiver using a 24-hour period LQA database. With this information, the transceiver is able to select the most suitable channel/mode for you when you make a call.

You are able to make global ALE ALL calls with this option.

Codan's automated link management (CALM) is interoperable with FED-STD-1045 ALE.

MIL-STD-188-141B ALE

The MIL-STD-188-141B ALE option includes the FED-STD-1045 ALE/CALM option. It provides the capability to make ALE calls using ALL, ANY, Group Selective, NET, and Wildcard address syntaxes. These calls connect one station to many stations at the same time. The MIL-STD-188-141B ALE option also provides advanced LQA, advanced messaging, and access to a Heard List.

The MIL-STD-188-141B ALE option is interoperable with FED-STD-1045 ALE and MIL-STD-188-141B.

Self address

An address is the sequence of characters that an operator at one station uses to call another station. A self address is the sequence of characters that identifies your station. For a Codan Selcall HF network, the self address may be up to 10 digits. For an ALE/CALM HF network, the address may be up to 15 upper-case/numeric characters, or a combination of both.

This self address is associated with an HF network. The HF network defines what call system is used to make and receive calls. The self address and HF network together define if the transceiver reacts to signals that it detects on air. If a transceiver detects its address while scanning an HF network, it accepts the call.

You can enter a self address and up to 16 additional self addresses for an HF network, or leave both entries blank.

NOTE: If you are using a peripheral device and associated software that can have its own self address, for example, RC50-C HF email software, 3033 Telephone Interconnect, and 3031 Crosspatch, you can leave the self address blank for the HF network that you are planning to use for communication via this device.

NOTE: When the 3031 Crosspatch is connected as a peripheral device to the GP port connector and you want to be able to receive calls that are specifically addressed to the crosspatch, you must enter its self address in the **RFU GP Port Startup** entry, for example **selfid 3031**

Related links:

Additional self addresses on page 198
Overview of the 3031 Crosspatch on page 113
RFU GP Port Startup on page 243

Scan tables

An HF network must have an associated scan table of channels on which to make calls, or it can use any channel programmed into the transceiver if the **Global** entry is enabled for the HF network.

Additional self addresses

An address is the sequence of characters that an operator at one station uses to call another station. A self address is the sequence of characters that identifies your station. For a Codan Selcall HF network, the self address may be up to 10 digits. For an ALE/CALM HF network, the address may be up to 15 upper-case/numeric characters, or a combination of both.

You can enter up to 16 additional self addresses for an HF network that is used with multiple control points. Only one self address may be registered for use by a control point in an HF network at a time, however, you can select and register a different self address from the list of self addresses at any time. Control points that are connected to the same RFU may use the same self address, if required.

When a control point is connected to a particular RFU for the first time, you are prompted to register which self address you want to use if there are two or more addresses available in the pre-defined list. Once registered, the control point remembers this selection for this HF network until you choose to change it. If the RFU and a connected control point have incompatible information stored for an HF network, you will be prompted to register a self address for the control point.

NOTE: If you decline to register at this prompt, you can register a self address in **General** > **Register Self Address** (available in advanced view if the HF network has two or more self addresses).

Related links:

Registering a self address on page 494
Deleting additional self addresses on page 205
Viewing information for connected control points on page 499
Self address on page 197

Global

An HF network typically has channel information associated with it in the form of scan tables. If you want the HF network and self address to be used to make and receive calls on any channel that is programmed in the transceiver, select the **On** check box for the **Global** entry.

Preamble

Preamble may be used in HF networks that use the Selcall and ALE/CALM call systems only. When you make a call to a specific station or group of stations, the addresses of those stations are sent in a preamble signal before the call is established. Transceivers that are scanning listen for the nominated dwell time on each channel that is being scanned. If the transceiver detects a preamble signal, it pauses scanning and determines if its address is in the preamble. If an address in the preamble matches the self address of the listening station, and it has a matching call system, the station switches off the scan and mute, ready to establish the call with the other station. If there is no matching address in the preamble, the listening station resumes scanning.

The preamble that is sent must be transmitted for a period of time greater than or equal to the channel dwell time multiplied by the number of channels being scanned in the transceiver that is being called.

Preamble length

The length of preamble that is sent with a call is dependent on the number of channels being scanned in the listening station, and the channel dwell time. If you select the **Auto** value for the preamble length, the transceiver calculates this value for you.

When a transceiver calculates the preamble length automatically, it assumes that the transceiver at each station is set up similarly. The length of preamble sent at the beginning of a call is calculated from the information from the scan tables associated with the HF network used for the call. If the communicating systems are set up identically, then this information provides the exact duration of preamble required to cover the scan cycle at the listening station. The transceiver sums the total channel dwell time for each scan table allocated to the HF network.

If you are calling a station that uses identical HF network information, the preamble of the calling station matches the detection requirements of the called station.

Related links:

Preamble on page 199
Channel dwell time on page 184

Send preamble

You can set up the HF network to always send preamble, or only when it is scanning. Therefore, if you are operating in an HF radio communication network that requires stations to not be scanning, you can reduce network traffic by selecting **Only when scanning**.

Related links:

Preamble on page 199

Sounding interval

The **Sounding Interval** entry applies to ALE/CALM HF networks only. The sounding interval is the time between automatic sounding signals that the transceiver sends to other stations to assess the quality of the channels in the HF network.

The recommended value is 5 hours. The longer the value, the longer the transceiver takes to update its channel quality information. If the value is set to 5 hours, the transceiver takes 5 days to completely update channel quality information. Longer sounding intervals decrease the interruptions on channels allocated to this HF network via a scan table.

NOTE: Link quality information is also updated each time a call is made or received.

Privacy mode

The **Privacy Mode** entry applies to Codan Selcall and ALE/CALM HF networks only. The privacy mode is the method used to encrypt the data content of calls between stations. If you select **Group**, you must enter an appropriate password into the **Privacy Password** entry.

Privacy mode...	Is used for...
Group	encrypting data in calls between two stations (you agree upon a password to enter into the **Privacy Password** entry)
None	calls made under a Codan protocol, which uses special formatting
Plain (lowest mode) (MIL-STD-188-141B ALE option)	AMD messages in ALE calls (basic 64 ASCII subset A to Z, 0 to 9, space ! " # $ % &' ( ) * + , - _ . / : ; <= > ? @ [\ ] ^)

When you are setting up ALE/CALM HF networks, you should ensure that you set up HF networks with the same privacy mode for communication. If there is a mismatch in privacy modes, the called station uses the most suitable privacy mode from the HF networks through which the call may be received.

For example, if a calling station starts an ALE call containing data through an HF network that has its privacy mode set to **Plain**, and the called station determines that the address is valid in HF networks with the privacy mode set to **Group** or **Plain**, then it selects the HF network with the privacy mode set to **Plain** on which to establish the link. Any data communications within this link use the basic 64 ASCII subset of characters.

However, if the called station determines that the address is available in an HF network with the privacy mode set to **Group**, it selects this HF network on which to establish the link. Data communications within this link are only successful if the calling station uses the same password as the HF network with the privacy mode set to **Group** at the called station.

If a calling station starts an ALE call without data, the called station determines in which HF networks the address is valid, selects an HF network with the lowest privacy mode available, then establishes the link. Data communications may proceed as per the privacy modes of the selected calling and called HF networks.

Privacy password

The **Privacy Password** entry applies to Codan Selcall and ALE/CALM HF networks where the privacy mode is set to **Group**. The privacy password is defined arbitrarily by the system administrator or user, and programmed into the transceiver. The password can be up to 15 characters long.

CAUTION: Changing this password must be managed across all transceivers using this HF network.

Secure state

The **Secure State** entry applies to ALE/CALM HF networks when there is a digital voice or encryptor option enabled. It controls the secure status of the Envoy transceiver when it receives a Selective, Phone or Emergency call via the HF network.

If you want the transceiver to:

- go to digital voice and/or secure for all communications via the HF network, select **Secure on**
- go to analogue voice and/or clear for all communications via the HF network, select **Secure off**
- remain in the current digital/secure/analogue/clear state set by the control point, select **Leave as is**

The default behaviour is to remain in the current state.

CAUTION: If the Envoy transceiver is connected to a 3033 Telephone Interconnect in a telephone station, the **Secure State** entry must be set to **Leave as is**.

For an incoming call, there may be multiple HF networks that are suitable to receive the call. The transceiver selects the HF network according to the following:

- If all matching HF networks are set to **Leave as is**, then the transceiver remains in its current state.
- If at least one matching HF network is set to **Secure off** and the remaining matching HF networks are set to **Leave as is**, then the transceiver goes to analogue voice and/or clear.
- If at least one matching HF network is set to **Secure on** and the remaining matching HF networks are set to **Leave as is**, then the transceiver goes to digital voice and/or secure.
- If there is a mix of matching HF networks set to **Secure on** or **Secure off**, the transceiver remains in its current state.

Related links:

Using digital voice on page 392
Using encryption on page 428

Rx only

The **Rx Only** entry sets whether the address set for this HF network is used for receiving calls only, or can be used for sending calls also.

Working with HF networks

Related links:

Entries for an HF network on page 196
Overview of HF networks on page 194
Overview of scan tables on page 182
Registering a self address on page 494
Navigating the menu structure on page 141
Entering text in a field on page 152
Selecting a value from a list on page 159
Selecting/deselecting a check box on page 160
Saving your changes on page 163
Group calls in a Codan Selcall HF network on page 596

Adding an HF network

An HF network provides a relationship between the call system, self address and scan tables.

NOTE: To view all of the available entries, log in to admin level and switch to advanced view.

To add an HF network:

- From the main menu, select (**User Data**), then (**HF Networks**).
- Do *one* of the following:
  - If there are no HF networks programmed in the transceiver, press (**Add**).
  - If there are some existing HF networks programmed in the transceiver, scroll to the HF network after which you want to add the new HF network, press (**Options**), scroll to **Add**, then press (**Select**) to add an HF network.
- Enter the name that you want to use for the HF network.
- Press to move to the **Call System** entry.
- Press or to select the call system that you want to use.
- Press to move to the **Selcall Self Address** | **ALE Self Address** entry.
- Enter the self address that you want to use for calls made from and to this HF network, or leave the entry blank if a peripheral device has its own self address set.

  If you are entering a self address to be used in:
  - a Codan Selcall HF network, enter up to 10 digits
  - an ALE/CALM HF network, enter up to 15 upper-case/numeric characters, or a combination of both

CAUTION: If you intend to send calls to a station that is compatible with 4-digit self addresses only, you must set up a 4-digit self address.

NOTE: Do not enter a self address that ends with one or more zeros. Zeros are used to indicate that calls are to be made to groups of stations in a Codan Selcall HF network.

- ❑ Press ▼ to move to the **Scan Tables** entry.
- ❑ To select a scan table:
  - Press ▶ to view the list of available scan tables.
  - Press ▲ or ▼ to scroll to the scan table that you want to use, then press **OK**.
  - Press ⌐ (**Save**).
- ❑ Press ▼ to move to the **Additional Self Addresses** entry.
- ❑ To add an additional self address:
  - Press ▶.
  - Press ⌐ (**Options**), scroll to **Add**, then press ⌐ (**Select**).
  - Enter the self address.
  - Continue adding self addresses.
  - Press ⌐ (**Options**), scroll to **Save**, then press ⌐ (**Select**).
- ❑ Press ▼ to move to the **Global** entry.
- ❑ If you want the information for this HF network to be used for all channels programmed in the transceiver, select the **On** check box.
- ❑ Press ▼ to move to the **Preamble Length** entry.
- ❑ If the **Auto** value is not suitable, press ▶ repeatedly to increment the preamble length by 1 sec, up to a maximum of 50 sec/HF network.
- ❑ Press ▼ to move to the **Send Preamble** entry.
- ❑ Press ◀ or ▶ to scroll through the following values:
  - To send preamble with every call made via this HF network, select **Always**.
  - To send preamble only when your transceiver is scanning when you start a call, select **Only when scanning**.
- ❑ If you are adding an HF network with an ALE/CALM call system:
  - Press ▼ to move to the **Sounding Interval** entry.
  - Press ◀ or ▶ to select the sounding interval that you want to use, or disable sounding.
- ❑ Press ▼ to move to the **Privacy Mode** entry.

- Press ◀ or ▶ to scroll through the following values:
  - To make calls between two stations using a Codan protocol with special formatting, select **None**.
  - To encrypt data in calls between two stations using an agreed privacy password, select **Group**.
  - To send AMD messages in ALE calls (MIL-STD-188-141B ALE only), select **Plain**.
- Press ▼ to move to the **Privacy Password** entry.
- To enter a privacy password:
  - Press ▶.
  - Enter the password that you want to use in the **New Password** field.
  - Press (**Save**).
- Press ▼ to move to the **Rx Only** entry.
- If you want the HF network to be used for receiving calls only, press **OK** to select the **On** check box.
- If you want to review the information that you have entered, press ▲ or ▼ to move through the entries.
- Press (**Save**) to save the information.
- Press (**Close**).

Deleting additional self addresses

To delete additional self addresses:

- From the main menu, select (**User Data**), then (**HF Networks**).
- Press ▲ or ▼ to scroll to the **Additional Self Addresses** entry.
- Press ▶ to view the list of additional self addresses available for the HF network.
- Press ▲ or ▼ to scroll to the self address that you want to delete from the HF network.
- Press (**Options**), scroll to **Delete**, then press (**Select**).
- Delete other self addresses from the **Additional Self Addresses** entry, if required.
- Press (**Options**), scroll to **Save**, then press (**Select**).
- Press (**Save**) to save the information.
- Press (**Close**).

Editing an HF network

Editing an HF network is similar to adding an HF network.

To edit an HF network:

- From the main menu, select (**User Data**), then (**HF Networks**).
- Press ▲ or ▼ to scroll to the HF network that you want to edit, then press **OK**.
- Continue with the process for adding an HF network.

Related links:

Adding an HF network on page 203

Moving an HF network

To move an HF network:

- From the main menu, select (**User Data**), then (**HF Networks**).
- Press ▲ or ▼ to scroll to the HF network that you want to move, press (**Options**), scroll to **Move**, then press (**Select**).
- Press ▲ or ▼ to scroll to the new location for the HF network in the list, then press (**Place**).
- Press (**Close**).

Deleting an HF network

To delete an HF network:

- From the main menu, select (**User Data**), then (**HF Networks**).
- Press ▲ or ▼ to scroll to the HF network that you want to delete, press (**Options**), scroll to **Delete**, then press (**Select**) to delete the HF network.
- Press (**Close**).

9 Phone links

This section contains the following topics:

Overview of phone links

NOTE: Phone links are visible in advanced view.

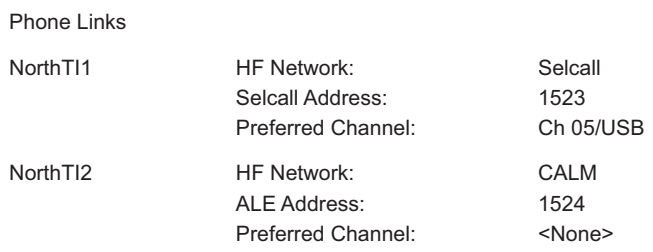
A phone link is a bundle of information that defines how your station communicates with a telephone station. A telephone station comprises a Codan HF transceiver that is connected to a radio/telephone interconnect unit. This unit routes Phone calls from HF transceivers to the public telephone network, and vice versa.

The address of the phone link station that you use, the HF network and the optional preferred channel/mode that you use to make a Phone call are stored in the entries for a phone link. By default, the address of the phone link is hidden when the profile is used in a transceiver. If you prefer, you can show the phone link address when the profile is used in your transceiver.

When you make a Phone call, the transceiver uses the information stored in the phone link to make the connection to the telephone station, which then places the call to the telephone number provided in the Phone call.

Figure 56 shows information that is stored for a phone link. Each item is described in detail in the sections following.

Figure 56: Information for a phone link



Entries for a phone link

NOTE: If you are entering text into a field in the control point, you may use characters from any of the supported languages.

Phone link name

A phone link contains the information required to contact a telephone station, which comprises a transceiver and a telephone interconnect. The phone link has a name that uniquely identifies it, and makes it available for selection in other areas of the user interface of the control point.

HF network

The **HF Network** entry identifies the HF network and associated scan table(s) through which the call is made to the telephone station.

Selcall|ALE address

The **Selcall|ALE Address** entry contains the address of the transceiver connected to the radio/telephone interconnect, or the address of the radio/telephone interconnect.

NOTE: By default, the address of the phone link is hidden when the profile is used in a transceiver. This setting may be changed in **Settings** > **Calling** > **General** > **Show Phone Link Address**.

Related links:

Show Phone Link Address on page 341

Preferred channel

The **Preferred Channel** entry identifies the *optional* channel/mode combination that is used to make a call to the telephone station. It is selected from the scan table(s) associated with the selected HF network.

CAUTION: If you change the HF network, the preferred channel is reset to **None** unless a preferred channel exists for the HF network that you have selected.

Working with phone links

Related links:

Entries for a phone link on page 209
Navigating the menu structure on page 141
Entering text in a field on page 152
Selecting a value from a list on page 159
Saving your changes on page 163

Adding a phone link

A phone link contains information about how you want to communicate with the telephone station and the telephone number that you want to call.

To add a phone link:

- From the main menu, select (**User Data**), then (**Phone Links**).
- Do *one* of the following:
  - If there are no phone links programmed in the transceiver, press (**Add**).
  - If there are some existing phone links programmed in the transceiver, scroll to the phone link after which you want to add the new phone link, press (**Options**), scroll to **Add**, then press (**Select**) to add a phone link.
- Enter the name that you want to use for the phone link.
- Press to move to the **HF Network** entry.
- Press or to select the HF network that you want to use.
- Press to move to the **Address** | **Selcall Address** | **ALE Address** entry.
- Enter the address of the transceiver or the radio/telephone interconnect at a telephone station that you are permitted to access.
- Press to move to the **Preferred Channel** entry.
- To select a preferred channel:
  - Press to see the list of available channels.
  - Press or to scroll to the channel that you want to use.
  - Press **OK** to select the channel.

    A is shown next to the channel.
  - Press (**Save**).
- If you want to review the information that you have entered, press or to move through the entries.

- Press (**Save**) to save the information.
- Press (**Close**).

Editing a phone link

Editing a phone link is similar to adding a phone link.

To edit a phone link:

- From the main menu, select (**User Data**), then (**Phone Links**).
- Press or to scroll to the phone link that you want to edit, then press **OK**.
- Continue with the process for adding a phone link.

Related links:

Adding a phone link on page 210

Moving a phone link

To move a phone link:

- From the main menu, select (**User Data**), then (**Phone Links**).
- Press or to scroll to the phone link that you want to move, press (**Options**), scroll to **Move**, then press (**Select**).
- Press or to scroll to the new location for the phone link in the list, then press (**Place**).
- Press (**Close**).

Deleting a phone link

To delete a phone link:

- From the main menu, select (**User Data**), then (**Phone Links**).

- Press ▲ or ▼ to scroll to the phone link that you want to delete, press (**Options**), scroll to **Delete**, then press (**Select**) to delete the phone link.
- Press (**Close**).

10 Contacts

This section contains the following topics:

Overview of contacts

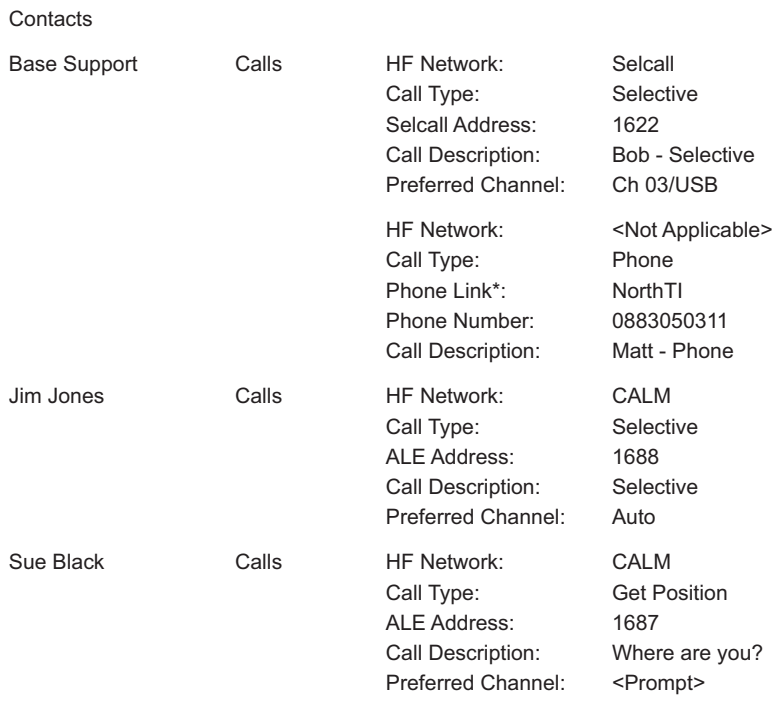
A contact is an operator or organisation who you want to call. You can define a number of potential calls that you may want to make to this contact, depending on location and the type of interaction that is required. For example, you may want to call Bob. During the day, Bob oversees communications at a fixed base station, and he has a transceiver at his desk. To communicate with him during the day, you could make a Selective, Message or Send Position call to his transceiver. After hours, Bob is at home, and no longer has access to his transceiver. To contact him via HF at this time of the day, you could make a Phone call to his home landline via a telephone station to which you have access.

Alternatively, the contact may be an organisation, and the calls that you define for it may be to individual people within that organisation.

Contacts has two tabs: **Contacts** and **Emergency Contacts**. The **Contacts** tab contains information on people or organisations who you call, and the types of calls that you want to make to them. The number of contacts that you can enter depends on the transceiver type and the options installed in the transceiver. The **Emergency Contacts** tab may contain up to 10 contacts who you may want to call in an emergency. You select the contact who you want to call, then the calls that are programmed for this contact are made in succession when you *hold* the ⚠ key for 2 sec. This type of call is called a chain call.

Figure 57 shows the information that is stored for a contact. Each item is described in detail in the sections following.

Figure 57: Information for a contact



Related links:

Adding a contact on page 219
Chain call on page 215

Chain call

A chain call starts automatically when you *hold* the ⚠ key for 2 sec. A chain call makes the calls for the selected emergency contact in succession. The length of time between calls is set in **Settings** > **Calling** > **General** > **Chain Call Pause**.

You should order the contacts in the **Emergency Contacts** tab with your most likely emergency contact at the top of the list. The calls within this emergency contact should be ordered to make calls that do not require operator intervention at the called end (for example, Message call, Send Position call), followed by calls that require an operator to answer. Once PTT is pressed, the chain call ends.

You should provide all of the information required to make the calls via the ⚠ key without the transceiver having to prompt for information, as this will slow down progress of the call. In an emergency situation, you may not have time, nor be able, to respond to prompts.

Related links:

Chain Call Pause on page 344

Entries for a contact

Contact name

A contact is a person or organisation for whom you want to store pre-defined call information. One contact may have several different methods of being called. The name of the contact is the label, in any supported language, identifying this bundle of call information. Typically, it is the person's or organisation's name. You can enter up to 32 characters to uniquely identify the contact.

NOTE: The number of characters that you can enter varies with the input language.

Calls for a contact

Each contact must have information for at least one call associated with it. A call for a contact bundles the information required by the transceiver to call that contact by a particular method. For example, you may want to call Bob (contact), and send the call to the transceiver in his vehicle (one address), or, you may want to communicate with him via a Message call (call type) to the transceiver on his desk (a second address). You can supply all of the information required to make each call, or you can be prompted for information at the time of making the call.

Related links:

Call types on page 574

HF network

The HF network that you select defines the call system, self address and scan tables used by your station to call this contact via this method. The HF networks from which you select must be pre-defined in **User Data** > **HF Networks**.

Related links:

HF networks on page 193

Call type

The call type is the particular type of call that you want to use to communicate with the contact. The call types from which you may select while adding a contact are defined in **Settings** > **Calling** > **General** > **Call Types For Contacts**.

Related links:

Call types on page 574
Call Types For Contacts on page 340

Selcall|ALE address

The address is used to identify the station that you want to call. This address is sent with the preamble when the call is made. A station that is scanning to detect calls made to its address responds according to the call system used by the associated HF network.

NOTE: The **Selcall|ALE Address** entry is not shown if the call system is RFDS, or if a valid phone link is selected.

Related links:

HF networks on page 193
ALE address syntax on page 585

Phone link

A phone link may be pre-defined and selected when adding a Phone call to a contact. When you select this phone link, you automatically select all of the details defined in the phone link, such as its address and the HF network that you use to make calls to this telephone station. If there is no phone link defined in the transceiver, you will be prompted for the details of the phone link at the time of the call.

Phone number

The phone number is the number of the telephone that you want to call via the radio/telephone interconnect at the telephone station. The phone number may be up to 40 characters long (0–9,*#+).

Message|Status type

The **Message|Status Type** entry for the call information is available when you select the Message or Get Status call types respectively. If you always want to send the same message, for example, that you are shutting down for the day and include the time and your GPS location, you would enter **Shutting down, $TIME, $GPS**. If you want to send a different message every time, select **Prompt**, and you will be prompted to enter a message at the time of sending the call.

Related links:

Messages on page 301
Sending recognised keywords with a call on page 598

Preferred channel

The optional preferred channel is selected from the scan table(s) associated with the selected HF network.

NOTE: The **Preferred Channel** entry is not shown if a valid phone link is selected. The preferred channel may be defined in the phone link.

Related links:

Channels on page 169

Call description

The **Call Description** entry enables you to enter a meaningful name for a call to distinguish it from other calls for the same contact. By default, the **Call Description** entry is filled with the call type. When you select a contact to call, you have to select the call that you want to make. The names that appear in this selection list are the call descriptions. Each call description for a contact must be unique.

For example, a contact may be called via two addresses using the same call type. In this instance, the call description defaults to the same call type: **Selective** and **Selective 1**. You can make these descriptions more meaningful by including the address or target station in the call description, for example, **Selective 1234** and **Selective Mob**.

Working with contacts

Related links:

Entries for a contact on page 216
Call types on page 574
Navigating the menu structure on page 141
Entering text in a field on page 152
Selecting a value from a list on page 159
Selecting/deselecting a check box on page 160
Saving your changes on page 163
Group calls in a Codan Selcall HF network on page 596

Adding a contact

Contacts are used to pre-define the typical calls that you want to make to another person or organisation, and calls that are made to an emergency contact when the ⚠ key is *held* for 2 sec.

You can define a number of calls for each contact. Each call contains information about:

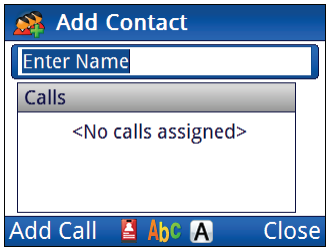
- the call system that you want to use
- the type of call that you want to make to the contact
- the address (or telephone number) of the station at which this contact may be located

NOTE: You can select some of the call information to prompt you for a choice at the time that a call is made via the contact. The **Prompt** value is available in these instances.

NOTE: To view all of the available entries, switch to advanced view. Some entries are only visible when a specific call type is selected.

To add a contact:

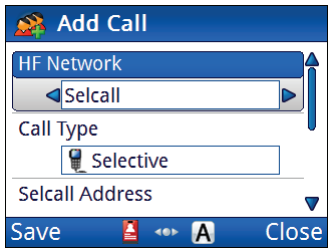
- From the main menu, select (**User Data**), then (**Contacts**).
- Select (**Contacts**) or (**Emergency Contacts**), as required.
- Press (**Add**).



- Enter the name that you want to use for the contact, then press (**Add Call**).

  The **HF Network** entry is highlighted.

  The HF network defines the call system and self address that is used by your station when the call is made. For example, if you are using a Selcall HF network, you must select a channel for the call. If you are using an ALE/CALM HF network, you may either select a channel or let the transceiver select a channel for the call.



- Press ◀ or ▶ to select the HF network that you want to use.
- Press ▼ to move to the **Call Type** entry.
- Press ◀ or ▶ to select the call type that you want to use.

  NOTE: The call type that you select affects information that you can enter for the remainder of this call.

- If you are adding:
  - a Selective, Channel Test, Emergency, Get Position or Send Position call, continue from *Adding a simple call* on page 220
  - a Message call, continue from *Adding a Message call* on page 221
  - a Phone call, continue from *Adding a Phone call* on page 223
  - a Get Status call, continue from *Adding a Get Status call* on page 223
  - an RFDS/Marine Emergency call, continue from *Adding an RFDS/Marine Emergency call* on page 224

Related links:

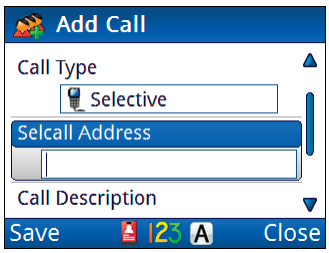
Overview of contacts on page 214

Adding a simple call

A simple call requires an address only at this stage of the definition process.

To continue with adding a Selective, Channel Test, Emergency, Get Position or Send Position call:

- Press ▼ to move to the **Address** | **Selcall Address** | **ALE Address** entry.



- Enter the address of the station that you want to call.
- Continue from *Completing the contact* on page 228.

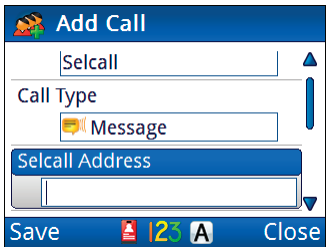
Related links:

Selective call on page 581
Channel Test call on page 575
Emergency call on page 576
Get Position call on page 577
Send Position call on page 582

Adding a Message call

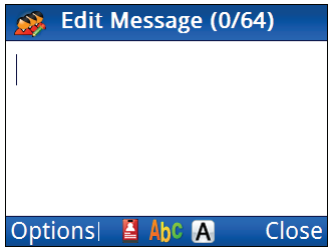
To continue with adding a Message call:

- Press ▼ to move to the **Address** | **Selcall Address** | **ALE Address** entry.



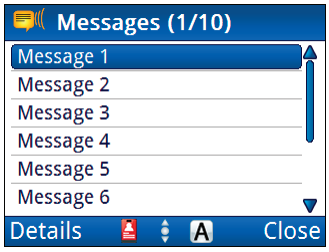
- Enter the address of the station that you want to call.
- Press ▼ to move to the **Message** entry, then press ▶.

NOTE: If you want to be prompted to enter a message at the time of the call, leave the value for the **Message** entry as **<Empty>**.



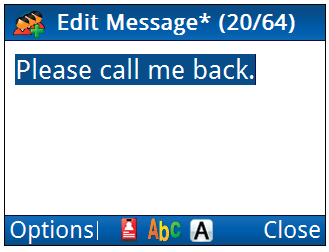
- If you want to enter a message:
  - *Hold* **#** to select a different input language, if required.
  - Start typing the message.

    NOTE: Press **OK** to start a new line, if required.
  - Press (**Options**), scroll to **Save**, then press (**Select**) to add the message to the call.
- If you want to select a message from a list of stored messages:
  - Press (**Options**), scroll to **Stored**, then press (**Select**).



  - Press ▲ or ▼ to scroll to the message that you want to use.

    NOTE: If you want to view the message, press (**Details**) to view the message, then press (**Close**).
  - Press **OK** to select the message.
  - Edit the message, if required.



  - Press (**Options**), scroll to **Save**, then press (**Select**).
- Continue from *Completing the contact* on page 228.

Related links:

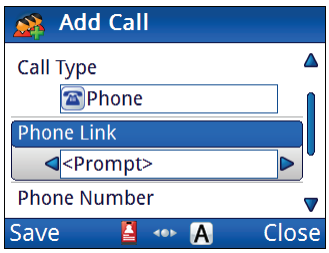
Message call on page 579

Adding a Phone call

To continue with adding a Phone call:

- Press ▼ to move to the **Phone Link** entry.

  NOTE: This entry is shown if there are two or more phone links from which to choose.



- Press ◀ or ▶ to select the phone link that you want to use, or select **<Prompt>** if you want to be prompted to select a phone link at the time of making the call.
- Press ▼ to move to the **Phone Number** entry.
- Enter the phone number.
- Continue from *Completing the contact* on page 228.

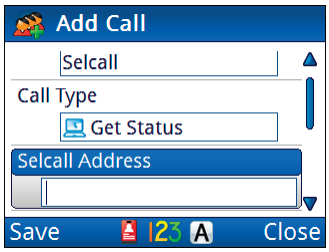
Related links:

Phone call on page 580

Adding a Get Status call

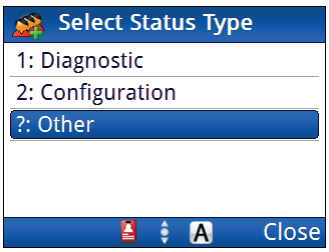
To continue with adding a Get Status call:

- Press ▼ to move to the **Address** | **Selcall Address** | **ALE Address** entry.

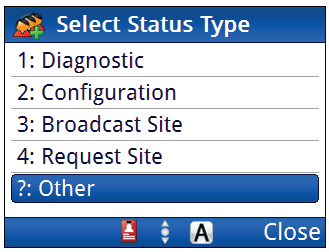


- Enter the address of the station that you want to call.
- Press ▼ to move to the **Status Type** entry, then press ▶.

Selcall HF network



ALE/CALM HF network
MIL-STD ALE option
ALE Site Manager:
Auto
Manual
Restricted



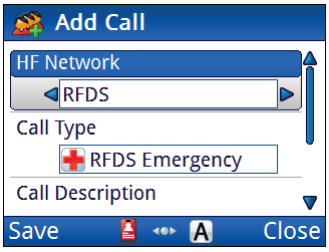
- Press ▲ or ▼ to scroll to the status type that you want to use, then press **OK**.
- If you selected **?: Other** as the status type, enter the text/command that you want to send, press (**Options**), scroll to **Save**, then press (**Select**).

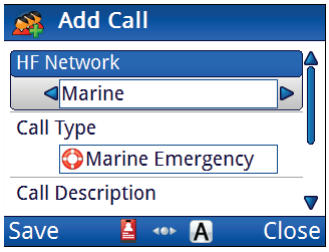
  NOTE: For information on over-the-air commands, please contact your Codan representative.

- Continue from *Completing the contact* on page 228.

Adding an RFDS/Marine Emergency call

NOTE: RFDS/Marine Emergency calls are only available when an RFDS/Marine Tone HF network is selected or you set the **HF Network** entry to **Prompt**.





To continue with adding an RFDS/Marine Emergency call:

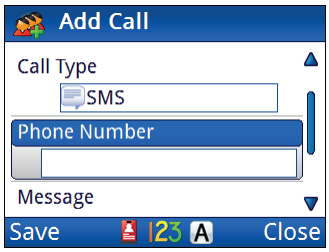
- Continue from *Completing the contact* on page 228.

Adding an SMS call

NOTE: The SMS call type may only be used when **Cell/Sat Modem** is the selected RFU GP Port peripheral device. Refer to *Selecting a peripheral device* on page 238 for further details.

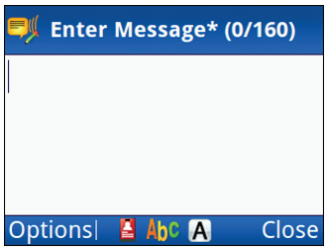
To continue with adding an SMS call:

- Press ▼ to move to the **Phone Number** entry.



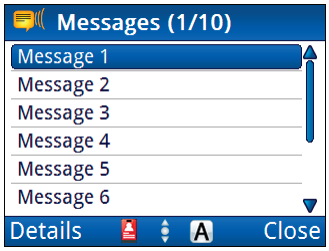
- Enter the phone number.
- Press ▼ to move to the **Message** entry, then press ▶.

  NOTE: If you want to be prompted to enter a message at the time of the call, leave the value for the **Message** entry as **<Empty>**.



- If you want to enter a message:
  - *Hold* **#** to select a different input language, if required.
  - Start typing the message.

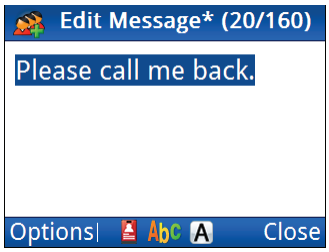
    NOTE: Press **OK** to start a new line, if required.
  - Press (**Options**), scroll to **Save**, then press (**Select**) to add the message to the call.
- If you want to select a message from a list of stored messages:
  - Press (**Options**), scroll to **Stored**, then press (**Select**).



- Press ▲ or ▼ to scroll to the message that you want to use.

  NOTE: If you want to view the message, press (**Details**) to view the message, then press (**Close**).

- Press **OK** to select the message.
- Edit the message, if required.



- Press (**Options**), scroll to **Save**, then press (**Select**).

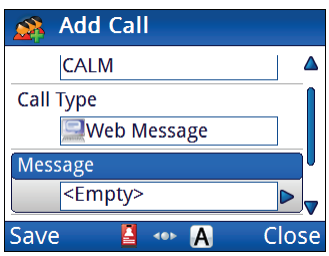
□ Continue from *Completing the contact* on page 228.

Adding a Web Message call

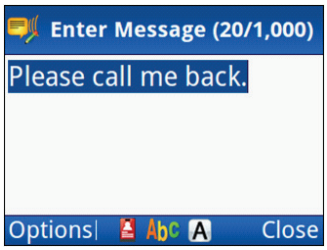
NOTE: The Web Message call type may only be used when **Cell/Sat Modem** is the selected RFU GP Port peripheral device. Refer to *Selecting a peripheral device* on page 238 for further details.

To continue with adding a Web Message call:

□ Press ▼ to move to the **Message** entry, then press ▶.

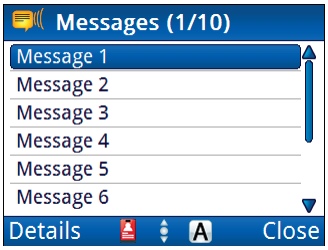


NOTE: If you want to be prompted to enter a message at the time of the call, leave the value for the **Message** entry as **<Empty>**.



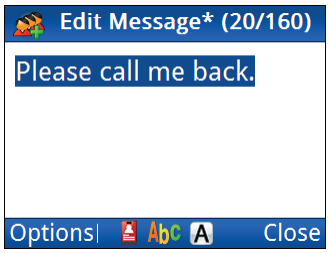
- If you want to enter a message:
  - *Hold* **#** to select a different input language, if required.
  - Start typing the message.

    NOTE: Press **OK** to start a new line, if required.
  - Press (**Options**), scroll to **Save**, then press (**Select**) to add the message to the call.
- If you want to select a message from a list of stored messages:
  - Press (**Options**), scroll to **Stored**, then press (**Select**).



  - Press ▲ or ▼ to scroll to the message that you want to use.

    NOTE: If you want to view the message, press (**Details**) to view the message, then press (**Close**).
  - Press **OK** to select the message.
  - Edit the message, if required.



- Press (**Options**), scroll to **Save**, then press (**Select**).

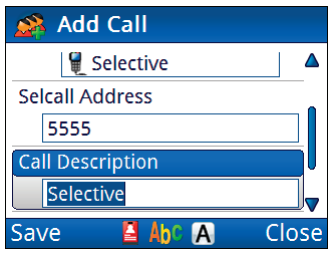
❑ Continue from *Completing the contact* on page 228.

Completing the contact

To finish entering the information required for the contact:

❑ Press ▼ to move to the **Call Description** entry.

The call type is entered automatically as the call description.

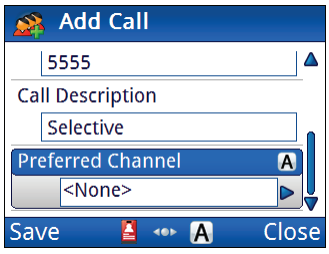


❑ Enter a new description for this call, if required.

❑ Press ▼ to move to the **Preferred Channel** entry.

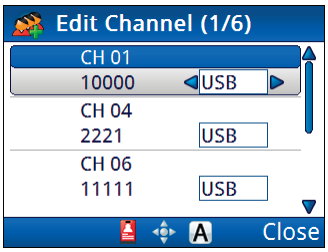
NOTE: Selecting a preferred channel is optional. If you communicate with the same contact and call over a 24-hour period, setting a preferred channel may limit effective HF propagation.

NOTE: If you do not want to select a preferred channel, leave the setting as **None**.



NOTE: This entry is not available for Phone calls.

- To select a channel:
  - Press ▶ to view the list of available channels.



  - Press ▲ or ▼ to scroll to the channel that you want to use, then press **OK**.

    A ✓ is shown next to the channel/mode.
  - Press ◀ or ▶ to change the mode, if required.

    NOTE: If you are not able to select a different mode, then only one mode is allowed for this channel. If you want to use a different mode, go to the relevant scan table, duplicate the channel, then select the new mode for this channel.
  - Press (**Save**).
- If you want to add another call, press (**Options**), scroll to **Add Call**, press (**Select**), then repeat the steps for adding a call.
- Press (**Options**), scroll to **Save**, then press (**Select**).
- Press (**Close**).

Editing a contact

Editing a contact is similar to adding a contact.

To edit a contact:

- From the main menu, select (**User Data**), then (**Contacts**).
- Press ▲ or ▼ to scroll to the contact that you want to edit, then press **OK**.
- Continue with the process for adding a contact.

Related links:

Adding a contact on page 219

Moving a contact

To move a contact:

- From the main menu, select (**User Data**), then (**Contacts**).
- Press ▲ or ▼ to scroll to the contact that you want to move, press (**Options**), scroll to **Move**, then press (**Select**).
- Press ▲ or ▼ to scroll to the new location for the contact in the list, then press (**Place**).
- Press (**Close**).

Moving a call for a contact

If you add a call to a contact, but want to move it to another place in the list of calls, you can rearrange the order.

NOTE: There must be at least two calls for a contact before you can move a call.

To move a call for a contact:

- From the main menu, select (**User Data**), then (**Contacts**).
- Press ▲ or ▼ to scroll to the contact in which you want to move the call, then press **OK**.
- Press ▼ to move to the **Calls** entry.
- Press ▲ or ▼ to scroll to the call that you want to move.
- Press (**Options**), scroll to **Move Call**, then press (**Select**).
- Press ▲ or ▼ to scroll to the location to which you want to move the call, then press (**Place**).
- Press (**Options**), scroll to **Save**, then press (**Select**).
- Press (**Close**).

Deleting a contact

To delete a contact:

- From the main menu, select (**User Data**), then (**Contacts**).

- Press ▲ or ▼ to scroll to the contact that you want to delete, press (**Options**), scroll to **Delete**, then press (**Select**) to delete the contact.
- Press (**Close**).

Adding a contact from the Call Log, Call History, or Last Heard Log

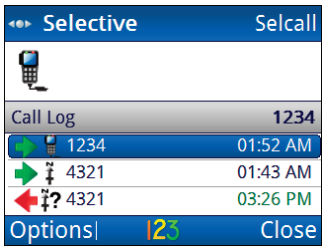
You can save information from the Call Log, Call History, or Last Heard Log to Contacts. This can either be a new call type for an existing contact, or you can add a new contact to hold this call information. The information is transferred automatically, so you do not have to re-enter information. The Call Log is a filtered instance of the Call History. The Call Log and Call History are accessed by different methods, and the Last Heard Log is a separate entity, however, the process for saving the call information to Contacts is the same.

NOTE: Within the Call History, you can also save a call to a contact from one of the filtered lists: Incoming Calls, Outgoing Calls, and Missed Calls.

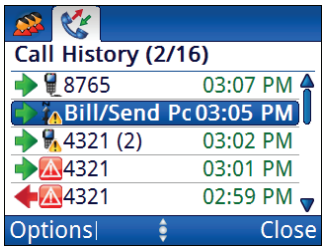
NOTE: An existing contact must be unlocked at the level at which you are making this addition.

Figure 58: Call Log, Call History and Last Heard Log

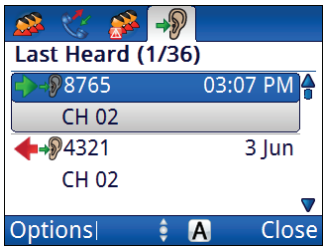
Call Log



Call History



Last Heard Log
(MIL-STD ALE option only)



To add a contact from the Call Log, Call History, or Last Heard Log:

- Do *one* of the following:
  - Press **CALL**, then press ▲ or ▼ to scroll to the entry in the Call Log.
  - *Hold* **CALL**, press ▶ to select (**Call History**), then press ▲ or ▼ to scroll to the entry in the Call History.
  - *Hold* **CALL**, press + **2** to go to advanced view, press ▶ to select (**Last Heard**), then press ▲ or ▼ to scroll to the entry in the Last Heard Log.

- Press (**Options**), scroll to **Save**, then press (**Select**).

  You are informed if there is a matching contact for the address in the call, and asked whether or not you want to append this call to that contact. If there is no matching contact you can create a new contact.

- Do *one* of the following:

  - If there is a matching contact who you want to use, press (**Yes**), then edit the call as required.
  - If you do not want to use the matching contact, press (**No**), create a new contact, then edit the call as required.
  - If there are several matching contacts, scroll to the contact who you want to use, press (**OK**), then edit the call as required.
  - If there is no matching contact, edit the call as required.

- Press (**Save**) to save the information.
- If the contact does not exist, enter a name for the contact, then press (**Save**).

Related links:

Call Log on page 592
Call History on page 593
Last Heard Log on page 595
Adding a contact on page 219

11 Peripherals

This section contains the following topics:

Overview of peripherals

Peripherals are devices that extend the capability of the transceiver system, for example, an external data modem, an automatic tuning antenna, or a GPS receiver. Each peripheral is attached to the transceiver via a compatible connector. In **User Data** > **Peripherals**, you select the connector, scroll through the list of devices that may be connected, select the device that you have connected, then restart the transceiver to activate the default settings for this device. The transceiver automatically picks the recommended values for the particular device.

NOTE: Peripheral devices in the table below that are marked with * have settings that may be changed to suit your requirements. These settings may be accessed via **User Data** > **Peripherals** then the particular connector you are using, or **Settings** > **Connectors** once the peripheral device has been selected.

CAUTION: When you select a different peripheral for a connector, all user-selectable entries are reset to their default value.

CAUTION: Codan recommends that you do not change the values for your peripheral device unless absolutely necessary. Please contact your Codan representative if you need assistance with your particular requirements.

Table 9: Peripherals

Peripheral type	Peripheral connector	Peripheral device
Antenna Type	(RFU)	Broadband antenna 9350 (default) 3040/3042/3046/3048 9103 Low power SG-235 500 W 1 kW Tuner

Table 9: Peripherals (cont.)

Peripheral type	Peripheral connector	Peripheral device
RFU GP Port	GP port connector (RFU)	None (default) 3212 Modem RM50e Modem MIL/STANAG 2G Data Interface 3012 Modem 2.4 kbit/s Data Modem Interface* Generic Modem* 3033 Telephone Interconnect* 3031 Crosspatch* PC* GPS* DVP-200* Audio Recorder* GPS Plotter* Cell/Sat Modem User-defined*
RFU 6-way	6-way connector (RFU)	None GPS* (default) PC* MIL/STANAG 2G Data Interface GPS Plotter* User-defined*
Console GP Port	GP port connector (desk console)	None (default) MIL/STANAG 2G Data Interface 2.4 kbit/s Data Modem Interface* 3033 Telephone Interconnect* PC* GPS* Audio Recorder* GPS Plotter* User-defined*

Table 9: Peripherals (cont.)

Peripheral type	Peripheral connector	Peripheral device
Power Amplifier	ᛘ (RFU)	None (default) 3061 500 W 3062 1000 W

NOTE: If you are using a morse key on the GP port connector, set the peripheral device to **None**, or customise the user-defined option to suit your requirements.

Related links:

Restrictions on peripheral use on page 256

Selecting an antenna

NOTE: If a Dual Antenna Adaptor is used with a 9103 and tuned whip on one of the antenna ports, you must select **9103**.

To select an antenna:

- From the main menu, select (**User Data**), (**Peripherals**), then (**Antenna Type**).
- Press ▲ or ▼ to scroll to the antenna type that you want to use, then press **OK**.
- Press (**Save**) to save the information.
- Restart the transceiver to activate the new settings.

Selecting a peripheral device

When you connect a peripheral device to the RFU GP port, RFU 6-way or Console GP port connector, you can set up how the port operates automatically by selecting the peripheral device from the list of supported devices for the connector.

NOTE: Codan peripheral devices are listed by their type number, for example, 3031 Crosspatch. The type number for a Codan device is located on the front or serial number escutcheon.

To select a peripheral device:

- From the main menu, select (**User Data**), then (**Peripherals**).
- Press ◀ or ▶ to select the icon corresponding to the connector to which the peripheral device is attached.
- Press ▲ or ▼ to scroll to the type of peripheral device that is attached to the connector, then press **OK**.

  If there are settings that you can change to customise this peripheral for your requirements, ▶ is shown to the right of the peripheral name when it is selected.
- If you want to change settings for the peripheral, press ▶ to see the list of entries that you may change.

  If the value of an entry for a peripheral device has been changed from the default value, ● is shown next to the title of the entry.
- Press (**Save**) to automatically update settings for correct operation of the connected peripheral device.
- If you added a peripheral device, and a prompt to restart the transceiver is displayed, accept it to to activate the new settings.

Related links:

Overview of peripherals on page 234

Selecting a power amplifier

To select a power amplifier:

- From the main menu, select (**User Data**), (**Peripherals**), then (**Power Amplifier**).
- Press ▲ or ▼ to scroll to the power amplifier that you want to use, then press **OK**.
- Press (**Save**) to save the information.
- Restart the transceiver to activate the new settings.

Uninstalling an RM50e HF Data Modem using CICS

When the RM50e HF Data Modem is connected as a peripheral device for the Envoy transceiver, the transceiver stores this connection in memory. If you no longer intend to use an RM50e as a peripheral device, you must deselect it as a peripheral device, and you must uninstall the RM50e using CICS.

NOTE: For information on using CICS commands, see *Application Note: Operating the transceiver via a computer and CICS,* Codan part number 17-60149.

To uninstall an RM50e HF Data Modem:

- Open a terminal session with the Envoy transceiver.
- Type the following commands:
  - startcics
  - dem uninstall

Setting up an Envoy telephone station for compatibility with older transceivers

The 3033 Telephone Interconnect is a peripheral device that connects an HF communication system with a public switched telephone network. The Envoy telephone station comprises an Envoy transceiver and a 3033 Telephone Interconnect.

NOTE: For details on installing the telephone interconnect and its operation, please see the *3033 Telephone Interconnect User Guide*.

NOTE: You must select the 3033 Telephone Interconnect as the peripheral device for the RFU GP port connector or Console GP port connector in **User Data** > **Peripherals**.

CAUTION: Only one 3033 Telephone Interconnect is supported with the Envoy Transceiver, i.e., the 3033 Telephone Interconnect must be configured on only the RFU GP port, or only (one) Console GP port.

If you are using the Envoy telephone station to communicate with older transceivers that do not have a Phone call option installed, you must include specific user-data information and enable settings in the Envoy transceiver for compatible behaviour.

To set up your Envoy transceiver to be compatible with older transceivers:

- Create a contact named **QD 99** that contains a Phone call with all entries left blank.
- Set the **Selcall Phone Channel Test** entry in **Settings** > **Calling** > **General** to **Enabled**.

Related links:

Adding a contact on page 219

Entries for RFU and desk console peripherals

You can add any of the peripherals listed in the corresponding connector on the RFU and the desk console. Some GPS Plotter entries may be available for some peripherals.

Related links:

Entries for RFU GP Port peripherals on page 242
Entries for RFU 6way peripherals on page 248
Entries for Console GP Port peripherals on page 250

Entries for RFU GP Port peripherals

Related links:

RFU GP Port Mode on page 242
RFU GP Port Speed on page 243
RFU GP Port Startup on page 243
RFU Average ALC on page 243
RFU ALC Rate on page 244
RFU Audio Type on page 244
RFU AGC on page 244
RFU PTT Beep on page 245
RFU Easitalk on page 245
RFU Mute Extend on page 245
RFU Mute Off After PTT on page 245
RFU Sidetone Volume on page 245
RFU Secure Audio on page 246
RFU Analogue Passthrough on page 246
RFU Transmit Audio on page 246
RFU Quiet Line on page 246
RFU GP Port MIL/STANAG 2G Data Interface on page 247
RFU GP Port 2.4 kbit/s Data Modem Interface on page 247
GPS Plotter Contexts on page 368
Output Local GPS on page 369
RFU GP Port CICS Polling on page 247
RFU Record On Tx on page 248

RFU GP Port Mode

The **RFU GP Port Mode** entry sets the mode in which the RS232 GP port operates. This entry is only available if you are setting up the GP port connector on the RFU for a user-defined peripheral device.

If the port is:

- not in use, select **None**
- receiving GPS information, select **GPS**
- controlling and monitoring the transceiver, select **CICS**
- connected to a modem, select **Data**
- connected to a radio/telephone interconnect unit, select **3033**
- connected to a device that interprets GPS information, select **GPS Plotter**

Default value: None

RFU GP Port Speed

The **RFU GP Port Speed** entry sets the data rate of the RS232 GP port. If available, you should set this to the same speed that is set in the connected peripheral device.

Default value: 9600 bit/s

RFU GP Port Startup

The **RFU GP Port Startup** entry sets the serial commands that you want to have performed by the GP port following power up.

Typically, this is used for specific commands that are required in a system that uses CICS commands. For example, you could enter the self address of the peripheral device connected to the GP port.

NOTE: When the 3031 Crosspatch is connected as a peripheral device to the GP port connector and you want to be able to receive calls that are specifically addressed to the crosspatch, you must enter its self address in the **RFU GP Port Startup** entry, for example **selfid 3031**

NOTE: You must switch the transceiver off then on again to activate the new value.

Default value: no selection

RFU Average ALC

The **RFU Average ALC** entry sets whether or not the transmit output power for the RFU is averaged. If it is set to **Disabled**, the peak output power is used.

Default value: Enabled

RFU ALC Rate

The **RFU ALC Rate** entry sets the ALC time constant.

If you want the transceiver to send:

- optimised voice signals, select **Voice (Fast)**
- optimised data signals, select **Data (Hold)**

Default value: Data (Hold)

RFU Audio Type

The **RFU Audio Type** entry sets the type of audio for the RFU.

If the transceiver is being used for:

- low-distortion audio, select **Data**
- fast, compressed audio, select **Voice**

Default value: Data

RFU AGC

The **RFU AGC** entry sets the rate of action of AGC for the input signal to the RFU.

To optimise AGC for:

- voice signals, select **Slow**
- special modes and morse code in a noisy environment, select **Fast**
- voice and linear data signals, select **Hold**

Default value: Hold

RFU PTT Beep

The **RFU PTT Beep** entry sets whether or not astrotones are transmitted when PTT is released on the GP port. This indicates that the RFU is completing its transmission.

Default value: Disabled

RFU Easitalk

The **RFU Easitalk** entry sets whether or not the received audio from the GP port is processed with Easitalk.

The *Easitalk* feature enables you to reduce the level of background noise that is present when you listen to a channel.

Default value: Disabled

RFU Mute Extend

The **RFU Mute Extend** entry sets the period of time that the mute is held open when voice is detected. The time is extended by this amount each time voice is detected on the channel, up to the maximum hold period set in the **Scan Voice Max Pause** entry.

Range: 1.0 to 10.0 sec

Default value: 3.8 sec

Related links:

Scan Voice Max Pause on page 339

RFU Mute Off After PTT

The **RFU Mute Off After PTT** entry sets the length of time that mute is held open after a PTT on the GP port.

Range: 0 to 5000 msec

Default value: 2000 msec

RFU Sidetone Volume

The **RFU Sidetone Volume** entry sets the volume of the call and ring tones heard at the GP port.

Range: –16 to 16

Default value: 0

RFU Secure Audio

The **RFU Secure Audio** entry sets whether or not secure audio is present on the GP port.

Default value: Disabled

RFU Analogue Passthrough

The **RFU Analogue Passthrough** entry sets whether or not analogue audio is passed to the GP port when secure or clear digital voice is enabled. If you have a 3031 Crosspatch or 3033 Telephone Interconnect connected as a peripheral device and you want analogue and digital signals to appear on the GP port when digital voice is enabled, set this to **Enabled**.

Default value: Enabled

RFU Transmit Audio

The **RFU Transmit Audio** entry sets whether or not transmit audio is present on the GP port.

If you want to record transmit audio, and have an audio recorder connected to the GP port and selected as a peripheral device, you should set this entry to **Enabled**.

Default value: Disabled

RFU Quiet Line

The **RFU Quiet Line** entry sets the behaviour of the Quiet line input to pause scanning in the transceiver. This can be set to detect either a high-going or low-going signal from your modem.

NOTE: Please refer to the documentation provided with your modem to determine which type of signal it outputs to the Quiet line.

If your modem:

- outputs a low signal to the Quiet line, select **Pause scan when low**
- outputs a high signal to the Quiet line, select **Pause scan when high**
- does not have a detect output, select **Disabled**

NOTE: When the transceiver is used with a modem that does not have a detect output, the transceiver must have scanning switched off, and data communications must take place on an agreed channel.

Default value: Disabled

RFU GP Port MIL/STANAG 2G Data Interface

The **RFU GP Port MIL/STANAG 2G Data Interface** entry sets whether or not this internal serial data interface is connected to the GP port. If you are connecting to a computer with RC50-C via serial cable 08-06952-00x, you must set this to **Enabled**.

CAUTION: If you want to use a USB or Ethernet connection between the transceiver and the computer running RC50-C (via VCOM), you must set the serial **RFU GP port MIL/STANAG 2G Data Interface** to **Disabled**.

Default value: Disabled

RFU GP Port 2.4 kbit/s Data Modem Interface

The **RFU GP Port 2.4 kbit/s Data Modem Interface** entry sets whether or not this internal data modem interface is connected to the GP port. If you are connecting to a computer with UUPlus©/Codan Chat© via serial cable 08-06952-00x, you must set this to **Enabled**.

CAUTION: If you want to use a USB or Ethernet connection between the desk console and the computer running RC50-C (via VCOM), you must ensure that your Console GP Port peripheral device is not already using the MIL/STANAG 2G Data Interface. To do this, either set your **Console GP Port MIL/STANAG 2G Data Interface** to **Disabled**, or otherwise ensure that RC50-C is not connected to the Console GP Port port. Refer to *Using VCOM services* on page 135 for further details.

Default value: Disabled

RFU GP Port CICS Polling

The **RFU GP Port CICS Polling** entry sets whether or not CICS polling occurs on the RFU GP port.

NOTE: You must switch the transceiver off then on again to activate the new value.

CAUTION: To allow some slack in the polling timeout, this setting shall be a bit higher than the actual polling interval of the external device.

Range: Disabled, 1 to 3600 sec

Default value: Disabled

RFU Record On Tx

The **RFU Record On Tx** entry sets whether or not the mute out state (pin 12) on the GP port of the RFU follows the transmit state of the transceiver.

Default value: Disabled

Entries for RFU 6way peripherals

Related links:

RFU 6way Mode on page 248
RFU 6way Speed on page 249
RFU 6way Startup on page 249
RFU 6way MIL/STANAG 2G Data Interface on page 249
RFU 6way CICS Polling on page 250
GPS Plotter Contexts on page 368
Output Local GPS on page 369

RFU 6way Mode

The **RFU 6way Mode** entry sets the mode in which the RS232 6-way serial port operates. This entry is only available if you are setting up the 6-way connector on the RFU for a user-defined peripheral device.

If the port is:

- not in use, select **None**
- receiving GPS information, select **GPS**
- controlling and monitoring the transceiver, select **CICS**
- accessing information from a log of radio/telephone interconnect activity, select **Log output**
- connected to a device that interprets GPS information, select **GPS Plotter**

Default value: GPS

RFU 6way Speed

The **RFU 6way Speed** entry sets the data rate of the RS232 6-way serial port. If available, you should set this to the same speed that is set in the connected peripheral device.

Default value: 4800 bit/s

RFU 6way Startup

The **RFU 6way Startup** entry sets the serial commands that you want to have performed by the 6-way port following power up.

Typically, this is used for specific commands that are required in a system that uses CICS commands.

NOTE: You must switch the transceiver off then on again to activate the new value.

Default value: no selection

RFU 6way MIL/STANAG 2G Data Interface

The **RFU 6way MIL/STANAG 2G Data Interface** entry sets whether or not this internal serial data interface is connected to the 6-way port. If you are connecting to a computer with RC50-C via serial cable 08-07318-00x, you must set this to **Enabled**.

CAUTION: If you want to use a USB or Ethernet connection between the transceiver and the computer running RC50-C (via VCOM), you must set the serial **RFU 6way MIL/STANAG 2G Data Interface** to **Disabled**.

Default value: Disabled

RFU 6way CICS Polling

The **RFU 6way CICS Polling** entry sets whether or not CICS polling occurs on the RFU 6-way port.

NOTE: You must switch the transceiver off then on again to activate the new value.

CAUTION: To allow some slack in the polling timeout, this setting shall be a bit higher than the actual polling interval of the external device.

Range: Disabled, 1 to 3600 sec

Default value: Disabled

Entries for Console GP Port peripherals

Related links:

Console GP Port Mode on page 250
Console GP Port Speed on page 251
Console GP Port Startup on page 251
Console Average ALC on page 251
Console ALC Rate on page 252
Console Audio Type on page 252
Console AGC on page 252
Console PTT Beep on page 252
Console Easitalk on page 253
Console Mute Off After PTT on page 253
Console Secure Audio on page 253
Console Analogue Passthrough on page 253
Console Transmit Audio on page 253
Console GP Port MIL/STANAG 2G Data Interface on page 254
Console GP Port 2.4 kbit/s Data Modem Interface on page 254
Console Record On Tx on page 254
Console Audio Output on page 255
GPS Plotter Contexts on page 368
Output Local GPS on page 369

Console GP Port Mode

The **Console GP port Mode** entry sets the mode in which the RS232 GP port operates. This entry is only available if you are setting up the GP port connector on the desk console for a user-defined peripheral device.

If the port is:

- not in use, select **None**
- receiving GPS information, select **GPS**
- controlling and monitoring the transceiver, select **CICS**
- connected to a modem, select **Data**
- connected to a radio/telephone interconnect unit, select **3033**
- connected to a device that interprets GPS information, select **GPS Plotter**

Default value: None

Console GP Port Speed

The **Console GP Port Speed** entry sets the data rate of the RS232 GP port. If available, you should set this to the same speed that is set in the connected peripheral device.

Default value: 9600 bit/s

Console GP Port Startup

The **Console GP Port Startup** entry sets the serial commands that you want to have performed by the GP port following power on.

Typically, this is used for specific commands that are required in a system that uses CICS commands. For example, you could enter the self address of the peripheral device connected to the GP port.

Default value: no selection

Console Average ALC

The **Console Average ALC** entry sets whether or not the transmit output power for the RFU is averaged. If it is set to **Disabled**, the peak output power is used.

Default value: Enabled

Console ALC Rate

The **Console ALC Rate** entry sets the ALC time constant.

If you want the transceiver to send:

- optimised voice signals, select **Voice (Fast)**
- optimised data signals, select **Data (Hold)**

Default value: Data (Hold)

Console Audio Type

The **Console Audio Type** entry sets the type of audio for the desk console.

If the transceiver is being used for:

- low-distortion audio, select **Data**
- fast, compressed audio, select **Voice**

Default value: Data

Console AGC

The **Console AGC** entry sets the rate of action of AGC for the input signal to the desk console.

To optimise AGC for:

- voice signals, select **Slow**
- special modes and morse code in a noisy environment, select **Fast**
- voice and linear data signals, select **Hold**

Default value: Hold

Console PTT Beep

The **Console PTT Beep** entry sets whether astrotones are transmitted when the PTT is released on the GP port. This indicates that the desk console is completing its transmission.

Default value: Disabled

Console Easitalk

The **Console Easitalk** entry sets whether or not the received audio from GP port is processed with Easitalk.

The *Easitalk* feature enables you to reduce the level of background noise that is present when you listen to a channel.

Default value: Disabled

Console Mute Off After PTT

The **Console Mute Off After PTT** entry sets the length of time that mute is held open after PTT on the GP port.

Range: 0 to 5000 msec

Default value: 2000 msec

Console Secure Audio

The **Console Secure Audio** entry sets whether or not secure audio is present on the GP port.

Default value: Disabled

Console Analogue Passthrough

The **Console Analogue Passthrough** entry sets whether or not analogue audio is passed to the GP port when secure or clear digital voice is enabled. If you have a 3033 Telephone Interconnect connected as a peripheral device and you want analogue and digital signals to appear on the GP port when digital voice is enabled, set this to **Enabled**.

Default value: Enabled

Console Transmit Audio

The **Console Transmit Audio** entry sets whether or not transmit audio is present on the GP port.

If you want to record transmit audio, and have an audio recorder connected to the GP port and selected as a peripheral device, you should set this entry to **Enabled**.

Default value: Disabled

Console GP Port MIL/STANAG 2G Data Interface

The **Console GP Port MIL/STANAG 2G Data Interface** entry sets whether or not this internal serial data interface is connected to the GP port. If you are connecting to a computer with RC50-C via serial cable 08-06952-00x, you must set this to **Enabled**.

CAUTION: If you want to use a USB or Ethernet connection between the desk console and the computer running RC50-C (via VCOM), you must ensure that your Console GP Port peripheral device is not already using the MIL/STANAG 2G Data Interface. To do this, either set your **Console GP Port MIL/STANAG 2G Data Interface** to **Disabled**, or otherwise ensure that RC50-C is not connected to the Console GP Port port. Refer to *Using VCOM services* on page 135 for further details.

Default value: Disabled

Console GP Port 2.4 kbit/s Data Modem Interface

The **Console GP Port 2.4 kbit/s Data Modem Interface** entry sets whether or not this internal data modem interface is connected to the GP port. If you are connecting to a computer with UUPlus©/Codan Chat© via serial cable 08-06952-00x, you must set this to **Enabled**.

CAUTION: If you want to use a USB or Ethernet connection between the desk console and the computer running the UUPlus/Codan Chat applications (via VCOM), you must ensure that your Console GP Port peripheral device is not already using the 2.4 kbit/s Data Modem Interface. To do this, either set your **Console GP Port 2.4kbit/s Data Modem Interface** to **Disabled**, or otherwise ensure that UUPlus/Codan Chat is not connected to the Console GP Port port. Refer to *Using VCOM services* on page 135 for further details.

Default value: Disabled

Console Record On Tx

The **Console Record On Tx** entry sets whether or not the mute out state (pin 12) on the GP port of the desk console follows the transmit state of the transceiver.

Default value: Disabled

Console Audio Output

The **Console Audio Output** entry sets the type of audio output on the GP port of the desk console.

If the connected device requires an input signal that is:

- unbalanced, select **Single-ended**
- balanced, select **Balanced**

Default value: Single-ended

Restrictions on peripheral use

The following peripheral devices must be limited to configuration and use on one port/interface in the system at a time:

- 3033 Telephone Interconnect
- MIL/STANAG 2G Data Interface
- 2.4kbps Data Modem Interface

If you would like to use the **3033 Telephone Interconnect**, ensure that only the RFU GP port or one of the Console GP ports is configured to use this peripheral.

If you would like to use the **MIL/STANAG 2G Data Interface**, ensure that only one of the RFU GP port, RFU 6-way port, Console GP port, or VCOM service port is configured to use this peripheral.

If you would like to use the **2.4kbps Data Modem Interface**, ensure that only one of the RFU GP port, Console GP port, or VCOM service port is configured to use this peripheral.

Attempting to configure any one of these peripheral types on more than one port/interface may result in undesirable behaviour.

It is also recommended that when multiple peripherals are configured (for example, a system configured for both **3033 Telephone Interconnect** and **3031 Crosspatch**), that simultaneous use of those peripherals be avoided (when possible). Requests from competing peripherals are generally handled on a “first-come, first-served” basis, meaning that requests from a competing peripheral can potentially be denied if the system is already in use. It is therefore recommended in such configurations that peripherals be used in a time-shared manner.

12 Modes

This section contains the following topics:

Overview of modes

Information about the modes available in the transceiver is stored in **User Data** > **Modes**. A mode specifies a combination of a sideband (for example, USB or LSB) and IF filter values (that is, bandwidth and centre frequency).

Each channel must have at least one mode. You may want to select several modes for each channel depending on the modes available to you.

Transceivers that are ISB-capable scan in the upper sideband of the frequency, and use this sideband for voice and message-type calls, establishing calls, and preambles. Any calls that are made to ISB-capable transceivers from transceivers that do not support ISB transmissions must be made on the frequency using the USB mode.

Related links:

Overview of channels on page 170

Available modes

The transceiver comes with a set of standard modes, and other modes may be added with enabled software options. Table 10 lists the standard modes that may be available within your transceiver. The modes that appear for selection with a channel are the allowed modes.

Table 10: Modes

Name of mode	Sideband	Rx/Tx	IF centre (Hz)	IF width (Hz)	Standard/Option
USB	USB	Rx/Tx	1500	2400	Standard
LSB	LSB	Rx/Tx	1500	2400	Standard
AM	AM	Rx	0	6000	Standard
AM	AM	Tx	1500	2400	AM mode option
USBW	USB	Rx/Tx	1675	2750	2750 Hz filter option
LSBW	LSB	Rx/Tx	1675	2750	2750 Hz filter option
USBXW	USB	Rx/Tx	1800	3000	3000 Hz filter option
LSBXW	LSB	Rx/Tx	1800	3000	3000 Hz filter option
UMCW	USB	Rx/Tx	900	500	500 Hz filter option
LMCW	LSB	Rx/Tx	900	500	500 Hz filter option
CW	USB	Rx/Tx	900	500	500 Hz filter option
ISB	ISB	Rx/Tx	2750	1675	ISB option

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13 Keys and macros

This section contains the following topics:

Overview of the keypad and macros

Each control point for the Envoy transceiver has a set of keys that are used to set up and operate the transceiver. The 2220 Handset and 2230 Desk Console have the Power and Emergency keys, and a full set of navigation and alphanumeric keys. The 2230 Desk Console also has three dedicated function keys. The 2221 Handset has the Power and Emergency keys, and the navigation keys. These are used for operation in conjunction with extra menu options in the user interface.

Figure 59: Power and Emergency keys

Figure 60: Navigation keys

Figure 61: Alphanumeric keys (2220/2230 only)

Figure 62: Function keys (2230 only)

Each key may have more than one function. This function depends on your current location in the user interface of the control point, the length of time that you press it, and whether or not you press it in conjunction with another key. Some keys have a specific function (macro) assigned to them. The Codan-defined macro name is written on the key in BLUE text. This function can be reassigned to other keys, if required. A key with a macro assigned to it is called a hot key. The dedicated function keys on the desk console may be used at any location within the user interface.

You can press a key briefly to perform the direct function, or you can *hold* a key for two seconds.

Related links:

Keypad on page 263
Macros on page 267

Keypad

Standard macros are programmed in the transceiver in the factory. You can also create a macro and assign it to a hot key.

Table 11: Keys and their function

Key	Function
⏻	Switches on the transceiver. Switches off the transceiver (*hold* for 2 sec). Performs a hot-key sequence with another key (*hold* + key): • ⏻ + 0 jumps to the Brightness screen • ⏻ + 2 toggles advanced view • ⏻ + 3 jumps to the Select Language screen (admin hidden) • ⏻ + SEC performs secure erase (if enabled) • ⏻ + ⚠ locks and/or erases important information in your transceiver if you need to abandon it (if enabled)
⚠	Starts a chain call of all of the calls included with the selected emergency contact (*hold* for 2 sec).
PTT	Press-to-talk. Cancels out of editing and calls before they are connected, returning directly to the channel/scanning screen.
	Performs the function shown directly above the key in the menu bar of the screen.
◀ 	Scrolls left in a list of values. Moves the cursor/highlight to the left. Reduces the volume when the  indicator is shown in the menu bar of the screen.
▶ 	Scrolls right in a list of values. Moves the cursor/highlight to the right. Increases the volume when the  indicator is shown in the menu bar of the screen.
▲	Scrolls up in a list of entries. Moves the highlight up a row.

Table 11: Keys and their function (cont.)

Key	Function
▼	Scrolls down in a list of entries. Moves the highlight down a row.
OK	Enters the submenu or list of entries represented by the selected icon/item. Toggles the selection of a check box. Enters the virtual keypad in character-entry mode of a 2221 Handset.
CALL	Starts the calling process by jumping to the call screen (default behaviour). Jumps to Contacts/Call History/Emergency Contacts/Last Heard Log (*hold* for 2 sec, default behaviour).
SCAN ↩ ⌫	Toggles scanning on and off. Ends a call. Deletes the character to the left of the cursor, one character at a time. Deletes all characters to the left of the cursor (*hold* for 2 sec).
1 TUNE	Enters 1 in character-entry mode. Tunes the antenna.
2 FUNC	Enters 2, a, b, c, A, B, C in character-entry mode for English, or other characters as per the selected input language. Accesses the clarifier for the currently selected channel.
3 MODE	Enters 3, d, e, f, D, E, F in character-entry mode for English, or other characters as per the selected input language. Selects the next allowed mode for the current channel.
4 FREE Rx	Enters 4, g, h, i, G, H, I in character-entry mode for English, or other characters as per the selected input language. Accesses the free-tune receive function. With some sales options, free-tune transmit may be available over specific frequency bands.
5	Enters 5, j, k, l, J, K, L in character-entry mode for English, or other characters as per the selected input language. Toggles the operating mode of a crosspatch, if connected.

Table 11: Keys and their function (cont.)

Key	Function
6	Enters 6, m, n, o, M, N, O in character-entry mode for English, or other characters as per the selected input language.
7 V/S	Enters 7, p, q, r, s, P, Q, R, S in character-entry mode for English, or other characters as per the selected input language. Toggles the type of mute selected.
8 SEC	Enters 8, t, u, v, T, U, V in character-entry mode for English, or other characters as per the selected input language. Toggles secure/digital voice mode on and off. Enables you to enter a PIN for a secure session, switch digital voice rates, or access secure information (*hold* for 2 sec).
9 GPS	Enters 9, w, x, y, z, W, X, Y, Z in character-entry mode for English, or other characters as per the selected input language. Opens the GPS screen, if the GPS Call option is installed.
0 VIEW	Enters a space (press) or 0 (*hold* for 2 sec) in character-entry mode. Toggles between the channel/scanning screen and Contacts/Call History/Last Heard Log.
***** EASITALK	Enters a special character in character-entry mode (repeated press, or *hold* for 2 sec to select from a list). Toggles *Easitalk* on or off.
#	Toggles character-entry mode. Enables you to select the input language (*hold* for 2 sec). Toggles between a top-level channel group and the channels within. Enables you to select a channel group (*hold* for 2 sec). Toggles between the Call History and the incoming/outgoing/missed call filters (2220/2230 only).
F1 F2 F3 (2230 only)	Stores macros that may be used in any context.

Related links:

Macros on page 267
Adding a macro on page 271
Manually tuning the antenna on page 42
Using the clarifier on page 83
Selecting a channel on page 29
Free tune on page 475
Selecting the mute type on page 40
Switching the secure feature on or off on page 428
Reducing background noise with Easitalk on page 84

Macros

NOTE: Macros are visible in advanced view.

If you want to simplify some of the tasks you perform with the transceiver you can create hot keys on the control point to perform the tasks for you. Each task is stored in a macro as a series of steps, and the macro is assigned to a hot key. Performing the tasks is then as simple as pressing or *holding* the hot key. Each macro may have up to 32 steps.

The transceiver is supplied with a set of standard hot keys. These functions are labelled on the corresponding hot key in **BLUE** text. The descriptions of these standard hot keys are included in Table 11. The hot keys to which these macros are assigned cannot be moved at user level. The user can create a macro and assign it to a hot key when in advanced view.

A macro can be assigned to the alphanumeric or ⏻ keys. When the user interface is in character-entry mode, macros assigned to an alphanumeric key cannot be used, as the key is used to enter characters. If you want to be able to use a macro at any time, you should assign the macro to the ⏻ key, or a function key on the desk console.

Related links:

Keypad on page 263
Advanced view on page 143
Switching between basic and advanced views on page 144

Entries for a macro

NOTE: If you are entering text into a field in the control point, you may use characters from any of the supported languages.

Macro name

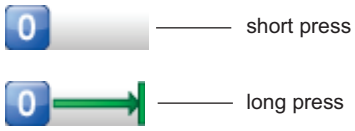
A macro is a set of actions that are grouped together and stored under a single name. The name of the macro should identify the general action, and must be unique for all macros assigned to the same key.

Key

A key is the physical key on the keypad of the control point to which you want to assign the macro, thus making the key a hot key. There are three function keys that are only available on the desk console. A macro can be invoked by either a short or a long key press of the hot key.

NOTE: Macros cannot be assigned to the left/right software keys, the navigation keys, the **OK** key, the ⚠ key, the **SCAN** key, or the **CALL** key.

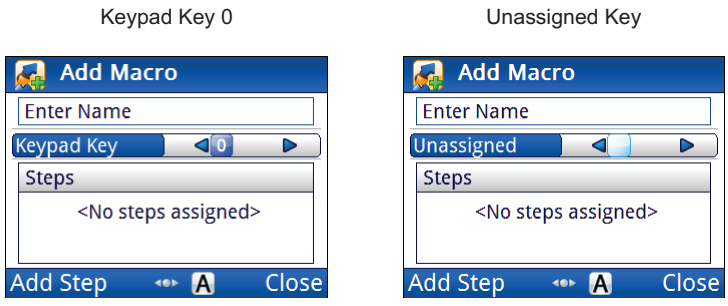
Figure 63: Length of key press for hot key



If you want to create the macro, but not assign it to a specific key for use, you can store it under **Unassigned**.

NOTE: **Unassigned** is selected by pressing ◀ from **Keypad Key** 0.

Figure 64: Unassigned key in the user interface of the control point



Steps

Steps are the individual actions that you put together to make up the complete action of the macro. For example, you may want to add a macro named 'Message Bob', where Bob is one of your contacts. The steps of this macro are: go to Contacts, go to Bob, select the call item that sends a Message call to Bob, then send the call.

A step consists of an activity, the location of the activity or the factory macro for the activity, and the delay before the activity is started. A macro may contain up to 32 steps.

The activity of the macro step can be:

- to show a screen
- to select a peripheral
- to perform an action
- to view or edit a setting

When you select the activity to be:

- **Show screen**, the **Screen** entry requires you to navigate to that screen
- **Select peripheral**, the **Peripheral** entry requires you to navigate to that peripheral
- **Perform action**, the **Action** entry requires you to select from a list of available actions (see Table 12)
- **View/Edit setting**, the **Setting** entry requires you to navigate to the setting, and the **Operation** entry sets the activity on the setting

NOTE: You can navigate to screens and settings that are available in the access level into which you are logged, and the view that you are showing.

The **Delay** entry is the length of time that lapses between macro steps (in msec).

Table 12: Available actions for a macro step

Activity	Available actions		
Perform action	Toggle Admin Login Toggle Advanced Toggle Antenna Toggle Channel Grouping Toggle Clarifier Toggle Easitalk Toggle Free Tune Toggle Internal Speaker Toggle Manual Tune Toggle Mute Toggle Scan Toggle Secure	Mute Type Set Mute Off Set Mute On Set Scan On Set Scan Off Set Secure On Set Secure Off	Show Call Log Show Channel Screen Show Contacts Discovery Screen
		Next Crosspatch State Next Digital Voice Rate Next Mode Next Tx Power	Call Call Contact Emergency Call Clear LQA
	Abandon Mode Erase Secure Keys Power Down Restart RFU Connect to RFU	Send text to RFU 6way Send text to RFU GP Port Send text to Console GP Port	Select Channel

NOTE: If you select the action **Call Contact**, you are able to select the contact and the type of call that you want to make from the existing list of call information for the contact.

NOTE: If you select the action **Select Channel**, you must enter the channel that you want the macro to select into the **Channel** entry.

Related links:

Moving a macro step on page 277

Working with macros

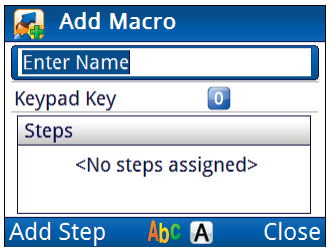
Adding a macro

A macro is one or more steps that combine to make up an action that happens at the press of the assigned hot key. You should plan the steps of your macro and enter them in a logical sequence, however, you can move the macro steps later, if required.

NOTE: You can navigate to screens and settings that are available in the access level into which you are logged.

To add a macro:

- From the main menu, select (**User Data**), then (**Macros**).
- Press (**Options**), scroll to **Add**, then press (**Select**) to add a macro.



- Enter the name that you want to use for the macro.
- Press to move to the **Keypad Key**|**Console Only** entry.
- Press or to select the hot key and the type of press (short or long) that you want to use to invoke the macro.

  NOTE: You can also press or *hold* the key that you want to set as the hot key on the control point.

  NOTE: **Unassigned** is selected by pressing from **Keypad Key** 0.
- Press (**Add Step**).

- Do *one* of the following:
  - To show a screen, continue from *Adding a step that shows a screen* on page 272.
  - To select a peripheral, continue from *Adding a step that selects a peripheral* on page 273.
  - To perform an action, continue from *Adding a step that performs an action* on page 274.
  - To view or edit a setting, continue from *Adding a step that views or edits a setting* on page 274.

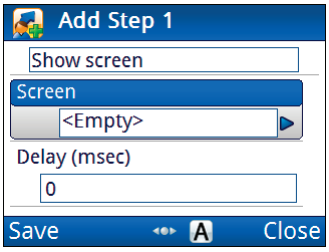
Related links:

Moving a macro on page 276
Navigating the menu structure on page 141
Entering text in a field on page 152
Entering text with the 2221 Handset on page 155
Selecting a value from a list on page 159
Selecting/deselecting a check box on page 160
Saving your changes on page 163
Overview of basic and advanced views on page 143
Overview of user and admin levels on page 145

Adding a step that shows a screen

To show a screen:

- Press ◀ or ▶ to select the **Show screen** value.
- Press ▼ to move to the **Screen** entry.



- Press ▶.

  The macro icon ( ) flashes at the top right of the screen.

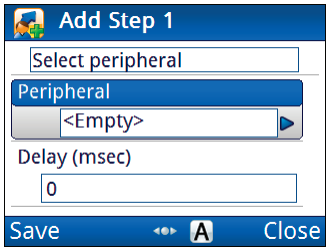
- Navigate to the screen that you want to show, then press (**Select**).
- Press ▼ to move to the **Delay** entry.
- Enter the delay (in msec) that you want before this macro step is executed.

  The delay may be up to 86,400,000 msec (24 hours).
- Press (**Save**) to save the information.
- Continue from *Completing the macro* on page 276.

Adding a step that selects a peripheral

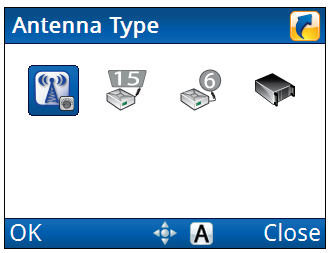
To select a peripheral:

- Press ◄ or ► to select the **Select peripheral** value.
- Press ▼ to move to the **Peripheral** entry.



- Press ►.

  The macro icon ( ) flashes at the top right of the screen.



- Navigate to the peripheral that you want to select, then press **OK**.

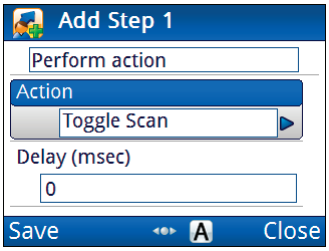
- Press ▼ to move to the **Delay** entry.
- Enter the delay (in msec) that you want before this macro step is executed.

  The delay may be up to 86,400,000 msec (24 hours).
- Press ⌐ (**Save**) to save the information.
- Continue from *Completing the macro* on page 276.

Adding a step that performs an action

To perform an action:

- Press ◄ or ► to select the **Perform action** value.
- Press ▼ to move to the **Action** entry.



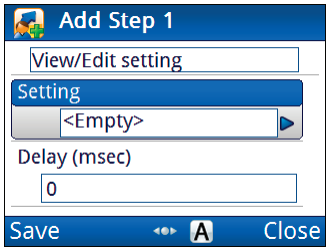
- Press ► to view the list of available actions (see *Available actions for a macro step* on page 270).
- Press ▲ or ▼ to scroll to the action that you want to use, press **OK**, then press ⌐ (**Save**).
- Press ▼ to move to the **Delay** entry.
- Enter the delay (in msec) that you want before this macro step is executed.

  The delay may be up to 86,400,000 msec (24 hours).
- Press ⌐ (**Save**) to save the information.
- Continue from *Completing the macro* on page 276.

Adding a step that views or edits a setting

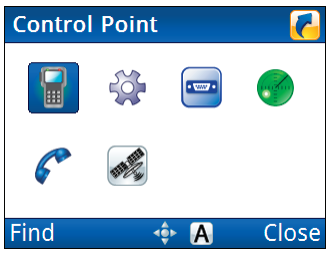
To view or edit a setting:

- Press ◄ or ► to select the **View/Edit setting** value.
- Press ▼ to move to the **Setting** entry.

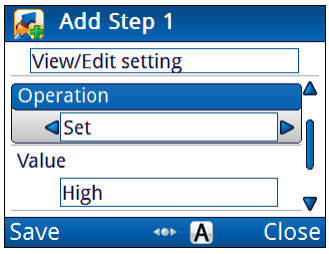


- Press ▶.

  The macro icon ( ) flashes at the top right of the screen.



- Navigate to the setting that you want to view or edit, then press (**Select**).
- Press ▼ to move to the **Operation** entry.
- Press ◀ or ▶ to scroll through the following values:
  - To access the entry for editing at the time of the macro, select **Open**.
  - To set a value in the entry at the time of the macro, select **Set**.
  - To toggle the state of the entry at the time of the macro, select **Toggle**.



- If you selected **Set** for the operation, do the following:
  - Press ▼ to move to the **Value** entry.
  - Press ◀ or ▶ to select the value that you want to use.
- Press ▼ to move to the **Delay** entry.
- Enter the delay (in msec) that you want before this macro step is executed.

  The delay may be up to 86,400,000 msec (24 hours).

- Press (**Save**) to save the information.
- Continue from *Completing the macro* on page 276.

Completing the macro

To complete the macro:

- If you want to add another macro step, press (**Options**), scroll to **Add Step**, then press (**Select**) to add a step.

  NOTE: When more than one macro step exists for the macro, you can move the steps to the order in which you want them performed.
- Continue adding steps until the macro is defined.
- Press (**Options**), scroll to **Save**, then press (**Select**).
- Press (**Close**).

Editing a macro

Editing a macro is similar to adding a macro.

NOTE: If you want to re-assign a macro between **Unassigned** and a hot key, edit the macro to select the new key/**Unassigned**.

To edit a macro:

- From the main menu, select (**User Data**), then (**Macros**).
- Press or to scroll to the macro that you want to edit, then press **OK**.
- Continue with the process for adding a macro.

Related links:

Adding a macro on page 271

Moving a macro

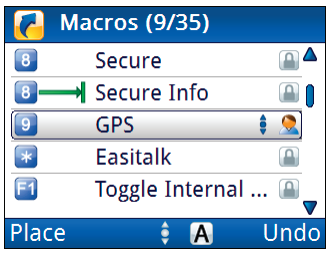
When you move a macro, you change the hot key to which it is assigned. As you change this hot key and the short/long press for the hot key, the macro gradually moves through the list.

NOTE: The factory-programmed macros cannot be moved at user level.

NOTE: If you want to re-assign a macro between **Unassigned** and a hot key, edit the macro to select the new key/**Unassigned**.

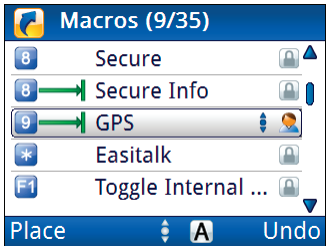
To move a macro:

- From the main menu, select (**User Data**), then (**Macros**).
- Press ▲ or ▼ to scroll to the user macro that you want to move.
- Press (**Options**), scroll to **Move**, then press (**Select**) to move a macro.



- Press ▲ or ▼ to scroll to the hot key and type of key press that you want to use for this macro.

  This is shown to the left of the macro name.



- Press (**Place**).
- Press (**Close**).

Related links:

Editing a macro on page 276

Moving a macro step

If you add a macro but discover that the macro steps that you have added are not in the correct order, you can rearrange the order of the steps.

NOTE: There must be at least two macro steps in the macro before you can move a macro step.

To move a macro step:

- From the main menu, select (**User Data**), then (**Macros**).
- Press ▲ or ▼ to scroll to the macro in which you want to move the macro steps, then press **OK**.
- Press ▼ to move to the **Steps** entry.
- Press ▲ or ▼ to scroll to the macro step that you want to move.
- Press (**Options**), scroll to **Move Step**, then press (**Select**).
- Press ▲ or ▼ to scroll to the location to which you want to move the macro step, then press (**Place**).
- Press (**Options**), scroll to **Save**, then press (**Select**).
- Press (**Close**).

Deleting a macro

To delete a macro:

- From the main menu, select (**User Data**), then (**Macros**).
- Press ▲ or ▼ to scroll to the macro that you want to delete, press (**Options**), scroll to **Delete**, then press (**Select**) to delete the macro.
- Press (**Close**).

Examples of macros

Creating a macro to toggle a setting

To create a macro to toggle the **CES-128 Mode** entry:

- From the main menu, select (**User Data**), then (**Macros**).
- Press (**Options**), scroll to **Add**, then press (**Select**).
- Enter the name that you want to use, for example **Toggle CES-128 Mode**.
- Press to move to the **Keypad Key** entry.
- Do *one* of the following:
  - Press or to select the key and key press duration that you want to use for this macro.
  - Press or *hold* the key that you want to use for this macro.
- Press (**Add Step**).
- Press or to select the **View/Edit setting** value.
- Press to move to the **Setting** entry.
- Press .
- Navigate to , then press **OK**.
- Press or to scroll to the **CES-128 Mode** entry, then press (**Select**).
- Press to move to the **Operation** entry.
- Press or to select the **Toggle** value.
- Press to move to the **Delay** entry.
- Enter the delay (in msec) that you want before this macro step is executed.

  The delay may be up to 86,400,000 msec (24 hours).
- Press (**Save**) to save the information.
- Press (**Options**), scroll to **Save**, then press (**Select**).
- Press (**Close**).

Related links:

Entering text in a field on page 152
Entering text with the 2221 Handset on page 155

Creating a macro to perform an action

To create a macro to perform an action:

- From the main menu, select (**User Data**), then (**Macros**).
- Press (**Options**), scroll to **Add**, then press (**Select**).
- Enter the name that you want to use, for example **Clarifier**.
- Press to move to the **Keypad Key** entry.
- Do *one* of the following:
  - Press or to select the key and key press duration that you want to use for this macro.
  - Press or *hold* the key that you want to use for this macro.
- Press (**Add Step**).
- Press or to select the **Perform action** value.
- Press to move to the **Action** entry.
- Press .
- Press or to scroll to the **Toggle Clarifier** value, then press **OK**.
- Press (**Save**).
- Press to move to the **Delay** entry.
- Enter the delay (in msec) that you want before this macro step is executed.

  The delay may be up to 86,400,000 msec (24 hours).
- Press (**Save**) to save the information.
- Press (**Options**), scroll to **Save**, then press (**Select**).
- Press (**Close**).

14 Waypoints

This section contains the following topics:

Overview of waypoints

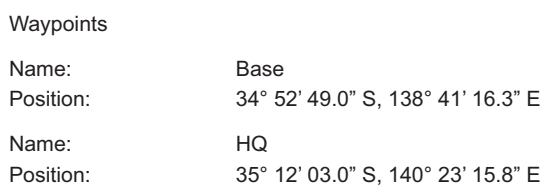
NOTE: You can set a waypoint if the GPS Call option is installed.

A waypoint is a collection of GPS information for a location. When you select a waypoint, the transceiver automatically calculates the distance and bearing from your current GPS information to the waypoint. You can create or change waypoints in **User Data** > **Waypoints**.

It may be useful to provide waypoint information for all of the fixed base stations in your communication network. Mobile stations can then select one of these waypoints to determine how far away and in what direction they need to travel to reach the base station. Alternatively, a fixed base station may set up a waypoint that makes a Get Position call to a mobile station to determine the distance and bearing to this contact. Mobile stations that are at the scene of an emergency can send their position to another station, then this information can be used in search and rescue planning.

Figure 65 shows the information that is stored for a waypoint. Each item is described in detail in the sections following.

Figure 65: Information for a waypoint



Related links:

Distance and bearing on page 96

Entries for a waypoint

NOTE: If you are entering text into a field in the control point, you may use characters from any of the supported languages.

Waypoint name

The waypoint name is a label, in any supported language, that is given to a GPS location.

A waypoint name can consist of letters, numbers, or a combination of both. The name uniquely identifies the waypoint, and makes it available for selection in other areas of the user interface of the control point.

Position

The **Position** entry holds the GPS information for the waypoint. It is displayed according to the value set in **Settings** > **GPS** > **GPS Format Options**.

Related links:

GPS Format Options on page 366

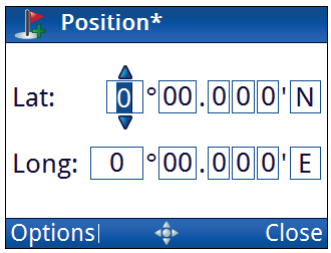
Working with waypoints

Adding a waypoint

A waypoint contains GPS information that is used to determine the distance to and bearing of the waypoint location with respect to the GPS location of the transceiver that you are operating.

To add a waypoint:

- From the main menu, select (**User Data**), then (**Waypoints**).
- Do *one* of the following:
  - If there are no waypoints programmed in the transceiver, press (**Add**).
  - If there are some existing waypoints programmed in the transceiver, scroll to the waypoint after which you want to add the new waypoint, press (**Options**), scroll to **Add**, then press (**Select**) to add a waypoint.
- Enter the name that you want to use for the waypoint.
- Press ▼ to move to the **Position** entry, then press ▶.



NOTE: The format of the GPS information is set in **Settings** > **GPS** > **GPS Format Options**.

- Do *one* of the following:
  - To use your current location, press (**Options**), scroll to **Use GPS**, then press (**Select**).
  - To enter a new location, press ▲ or ▼ to scroll to the value or use the numeric keys to enter the value that you want to set, then press ▶ to move to the next field.
- Press (**Options**), scroll to **Save**, then press (**Select**) to save the GPS information.
- Press (**Options**), scroll to **Save**, then press (**Select**) to save the waypoint.
- Press (**Close**).

Related links:

GPS Format Options on page 366

Editing a waypoint

Editing a waypoint is similar to adding a waypoint.

To edit a waypoint:

- From the main menu, select (**User Data**), then (**Waypoints**).
- Press ▲ or ▼ to scroll to the waypoint that you want to edit, then press **OK**.
- Continue with the process for adding a waypoint.

Related links:

Adding a waypoint on page 284

Moving a waypoint

To move a waypoint:

- From the main menu, select (**User Data**), then (**Waypoints**).
- Press ▲ or ▼ to scroll to the waypoint that you want to move, press (**Options**), scroll to **Move**, then press (**Select**).
- Press ▲ or ▼ to scroll to the new location for the waypoint in the list, then press (**Place**).
- Press (**Close**).

Deleting a waypoint

To delete a waypoint:

- From the main menu, select (**User Data**), then (**Waypoints**).
- Press ▲ or ▼ to scroll to the waypoint that you want to delete, press (**Options**), scroll to **Delete**, then press (**Select**) to delete the waypoint.
- Press (**Close**).

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15 NETs

This section contains the following topics:

Overview of NETs

NOTE: NETs are visible in advanced view.

NOTE: NET calling is available if the MIL-STD-188-141B ALE option is installed.

A NET is a special ALE addressing capability. With NET addressing, two or more stations are pre-configured to respond to the same NET address. When a station calls a NET, all stations with that NET address and their self addresses in the **NET Members** entry for the NET, respond in their designated response slot. If a transceiver has the NET programmed, but its address is not in the list of NET members, it can still receive communications from the NET. In the Envoy transceiver, a NET contains the configuration information required for making and receiving NET calls. This information defines the process for the handshake during link establishment.

The full 3-way handshake process involves a leading call from the calling station, a response from the called station, and an acknowledgement from the calling station. Following the acknowledgement, all stations that are able to, enter the link.

A station can have a NET programmed in its profile and either:

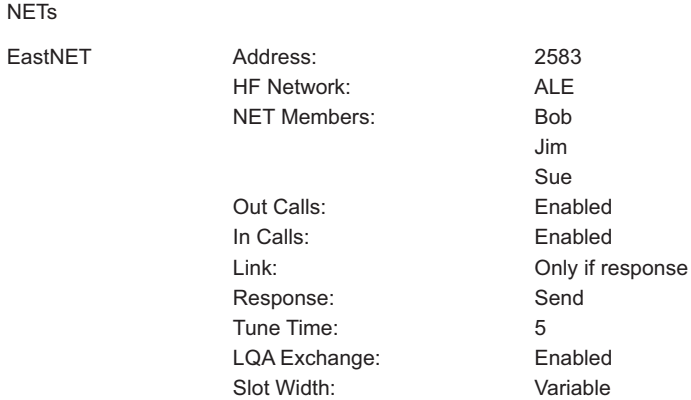
- be a member of the NET, that is, their self address is in the **NET Members** entry for the NET, or
- not be a member of the NET, that is, their self address *is not* in the **NET Members** entry for the NET

NETs are used with an ALE/CALM HF network. This defines the channels that may be used when establishing the ALE link via the allocated scan table(s), and the privacy mode for messaging within a call.

You can make a call to a NET by selecting the NET, Emergency, Message, Phone, Selective, or Send Position call type and entering the NET address. You can set up a contact to make a NET call.

Figure 66 shows the information that is stored for a NET. Each item is described in detail in the sections following.

Figure 66: Information for a NET



Related links:

Entries for a NET on page 290
Adding a NET on page 295

Entries for a NET

NOTE: If you are entering text into a field in the control point, you may use characters from any of the supported languages.

NET name

The NET name may be any meaningful name that you want to assign to the NET. The name uniquely identifies the NET, and makes it available for selection in other areas of the user interface of the control point. The name may be up to 32 alphanumeric characters including spaces. The NET name is only used for reference within the transceiver. It is not part of the NET configuration data.

Address

CAUTION: The NET address must be the same for all stations that have the NET programmed.

The **Address** entry contains the global address used by all stations that have the NET programmed in **User Data** > **NETs**. The address may be up to 15 alphanumeric characters (A–Z, 0–9), however, for efficiency of NET calls, it is preferable that the address be limited to 3 characters. You should choose an address that is different from the self addresses of members of the NET or wider communication audience.

HF network

CAUTION: The HF network must be the same for all stations that have the NET programmed.

The **HF Network** entry defines the scan table(s) containing the channels to be used with the NET. It is selected from the pre-defined list in **HF Networks**. You must select an ALE/CALM HF network for each NET. You can set up two NETs with the same address but with different HF networks, say one for Group privacy mode and one for Plain privacy mode. All other entries in the NET can be identical so that calls may be received via either HF network.

Related links:

Overview of HF networks on page 194
Privacy mode on page 200

NET members

CAUTION: The list of NET members must be the same for all stations that have the NET programmed.

NOTE: Once a NET is created, the **NET Members** entry must contain address information.

The **NET Members** entry contains a sequential list of the self addresses of up to 20 members of the NET. The station uses this list to calculate the response slots, so each station in the NET can determine when an automatic response is required after the start of the call. A member's self address may be up to 15 alphanumeric characters, however, for efficiency of NET calls, it is preferable that the self address of each member be limited to 3 characters. To preserve an empty slot use the null address (@@@) in a NET member position, for example, a station may be removed from **NET Members**, but you want the timing of response slots at other stations to remain the same.

NOTE: You can have the NET programmed in your transceiver, but you are only a member of the NET if your self address is included in the **NET Members** entry.

Out calls

The **Out Calls** entry enables you to set up your station to make calls to the NET, or disable calling to the NET. Unless you need to restrict calling to the NET, you should set the **Out Calls** entry to **Enabled** for all stations in the NET, regardless of their member status.

If you want to set up your NET so that only one station makes calls to the NET, set the **Out Calls** entry for the NET in that station to **Enabled**. Set the **Out Calls** entry for all other stations with this NET programmed to **Disabled**.

In calls

CAUTION: If the **Link** entry is set to **Only if response**, you must ensure that at least one member station is set to receive an incoming call from the NET *and* send a response to the link request.

The **In Calls** entry enables you to set up your station to receive all incoming calls from the NET, to receive calls only if you are a member of the NET, or to ignore calls from the NET.

If your station:

- has the NET programmed and you want to receive calls from the NET, select **Enabled**
- has the NET programmed but you are not a member, and you do not want to receive any calls from the NET, select **Members only**

  NOTE: As your station is not a member of the NET, it will not enter the link.
- is a member of the NET but you do not want to receive any calls from the NET, select **Disabled**

Related links:

Link on page 292
Response on page 293

Link

CAUTION: The method of linking must be the same for all stations that have the NET programmed.

The **Link** entry determines how the calling station links with the called stations.

It can link:

- only if it receives a response from a member station
- even if it doesn't receive a response from a member station
- immediately

Stations with the NET programmed only send a response to a NET call if:

- their self address is included in the **NET Members** entry for the NET, that is, they are a member of the NET, and
- the **Response** entry for the station is set to **Send**

You can set the following:

- If you want to know with which member stations you have linked, select **Only if response**.

  The calling station makes the call to the NET using the best average channel for all NET members. If there is no response to this channel, the calling station selects the next ranked channel and attempts the call again, and so on until at least one response is received. Any member station detecting the call responds, if they are enabled to do so, then the calling station completes the link. Non-member stations with this NET programmed also enter the link, but as they are not members, they do not send a response.

NOTE: If you set the **Link** entry to **Only if response**, you must be sure that there is at least one member station in your NET that is set to respond to a link request. If the calling station does not receive a response to the call after trying all channels for the NET, it terminates the link establishment process.

- If you want to send a NET call to all stations with the NET programmed, but you do not need to know which of the member stations enter the link, select **Even if no response**.

  The calling station makes the call to the NET using the best average channel for all NET members. All stations detecting the call enter the link, if enabled to do so.

- If you want to send a NET call to all stations with the NET programmed without the delay of the link establishment process, select **Immediately**.

  In this case, the calling station establishes an implicit link with any stations programmed with the NET that detected the call. There is no 3-way handshake.

Related links:

Response on page 293

Response

CAUTION: If the **Link** entry is set to **Only if response**, you must ensure that at least one member station is set to receive and respond to a call from the NET.

The **Response** entry sets whether or not called member stations respond to NET calls during link establishment. Members wait for the initial call to be sent, wait for the specified tune time, then send the response in the same order as that in the **NET Members** entry. As each receiving member station has the same list of members and critical timing information, the transceiver calculates the precise time slot in which to send the response. Similarly, the calling station calculates when to send the link to the NET.

Generally, you would set the **Response** entry to **Send**, so that there is confirmation of the station receiving the link request. If you do not want the called station to transmit on air, set the **Response** entry to **Don't send**. If a station is set to not respond, it still enters the link when it receives the acknowledgement from the calling station.

NOTE: The **Response** entry is only applicable to NET calls. It does not affect a station's ability to respond to an ANY, Group Selective or Wildcard call.

Related links:

Link on page 292
ANY call on page 586
Group Selective call on page 587
Wildcard call on page 589

Tune time

CAUTION: The time set for tuning antennas must be the same for all members of the NET.

CAUTION: The tune time is set to 0 sec by default. It should be changed to suit the requirements for NET calls in your HF communication network.

The **Tune Time** entry is the time that the members of the NET wait after the initial call before starting the automatic responses to the calling station. This time should be set to match the longest tuning time between all members in the NET. Typically, 9350 antennas tune in 2 sec and 3040/3042/3046/3048 antennas tune in 1 sec.

LQA exchange

CAUTION: The exchange of LQA information during link establishment must be the same for all members of the NET.

The **LQA Exchange** entry determines whether or not the exchange of LQA information occurs during calls within the NET. If this is set to **Enabled**, each transceiver adds an appropriate amount of time to the slot widths so that LQA information can be exchanged.

Slot width

CAUTION: The slot width must be the same for all members of the NET.

The **Slot Width** entry determines the width of response slots for each member of the NET.

You can set the following:

- If you want all slot widths to match the width required for the largest self address for a member of the NET, select **Fixed**.

  A fixed slot width extends the time taken to complete the handshake considerably.

- If you want the transceiver to calculate the slot width required for the response from each station, select **Variable**.

  NOTE: Unless required for interoperability reasons, the recommended setting is **Variable**.

A member station calculates exactly how long after the initial call it has to wait before sending its response given the slot width, whether LQA information is exchanged or not during each slot, and the tune time.

Working with NETs

Related links:

Entries for a NET on page 290
Overview of NETs on page 288
Navigating the menu structure on page 141
Entering text in a field on page 152
Selecting a value from a list on page 159
Changing the order of items in a list on page 162
Saving your changes on page 163

Adding a NET

A NET provides the relationship between the members of a NET, the NET address, and the HF network used for communication.

To add a NET:

- From the main menu, select (**User Data**), then (**NETs**).
- Do *one* of the following:
  - If there are no NETs programmed in the transceiver, press (**Add**).
  - If there are some existing NETs programmed in the transceiver, scroll to the NET after which you want to add the new NET, press (**Options**), scroll to **Add**, then press (**Select**) to add a NET.
- Enter the name that you want to use for the NET.
- Press to move to the **Address** entry.
- Enter the address that you want to use for the NET.

  You can enter up to 15 upper-case/numeric characters, or a combination of both.
- Press to move to the **HF Network** entry.
- Press or to select the HF network that you want to use.
- Press to move to the **NET Members** entry.
- To add NET members:
  - Press ▶.
  - Press (**Options**), scroll to **Add**, then press (**Select**).
  - Enter the address of the NET member.
  - Continue adding members.
  - Press (**Options**), scroll to **Save**, then press (**Select**).

- Press ▼ to move to the **Out Calls** entry.
- Press ◀ or ▶ to select the value that you want to use from the following:
  - To make calls from this station to the NET, select **Enabled**.
  - To prevent calls being made from this station to the NET, select **Disabled**.
- Press ▼ to move to the **In Calls** entry.
- Press ◀ or ▶ to select the value that you want to use from the following:
  - If your station has the NET programmed and you want to receive calls from the NET, select **Enabled**.
  - If your station has the NET programmed but you are not a member, and you do not want to receive any calls from the NET, select **Members only**.
  - If your station is a member of the NET but you do not want to receive any calls from the NET, select **Disabled**.
- Press ▼ to move to the **Link** entry.
- Press ◀ or ▶ to select the value that you want to use from the following:
  - If you want to know with which member stations you have linked, select **Only if response**.
  - If you do not need to know which of the member stations enter the link, select **Even if no response**.
  - If you want to link without the delay of the link establishment process, select **Immediately**.
- Press ▼ to move to the **Response** entry.
- Press ◀ or ▶ to select the value that you want to use from the following:
  - If you want the station to confirm that it has received the link request, select **Send**.
  - If you want the station to remain silent when it receives the link request but still enter the link, select **Do not send**.
- Press ▼ to move to the **Tune Time** entry.
- Press ◀ or ▶ to select the longest time required for tuning antennas within the NET.
- Press ▼ to move to the **LQA Exchange** entry.
- Press ◀ or ▶ to select the value that you want to use from the following:
  - If you want the station to add time to the slot for LQA exchange, select **Enabled**.
  - If you do not want the station to add extra time to the slot, select **Disabled**.
- Press ▼ to move to the **Slot Width** entry.

- Press ◀ or ▶ to select the value that you want to use from the following:
  - If you want all slot widths to match the width required for the largest self address for a member of the NET, select **Fixed**.
  - If you want the transceiver to calculate the slot width required for the response from each station, select **Variable**.
- If you want to review the information that you have entered, press ▲ or ▼ to move through the entries.
- Press (**Save**) to save the information.
- Press (**Close**).

Changing the order of NET members

Members of a NET have their self address included in the **NET Members** entry. The order of these addresses determines the slot in which each station responds to a NET call. To avoid conflicting responses in a slot, the order of the addresses in the list of NET members must be identical across all stations that are members of the NET. If required, you can change the order of the addresses in the list of NET members.

CAUTION: The list of NET members must be the same for all stations that have the NET programmed.

To change the order of NET members:

- From the main menu, select (**User Data**), then (**NETs**).
- Press ▲ or ▼ to scroll to the NET in which you want to rearrange the NET members, then press **OK**.
- Press ▼ to move to the **NET Members** entry.
- Press ▶ to view the list of NET members.
- Press ▲ or ▼ to scroll to the NET member that you want to move.
- Press (**Options**), scroll to **Move**, then press (**Select**).
- Press ▲ or ▼ to scroll to the location to which you want to move the NET member, then press (**Place**).
- Press (**Options**), scroll to **Save**, then press (**Select**).
- Press (**Close**).

Deleting a NET member

Members of a NET have their self address included in the **NET Members** entry.

CAUTION: The list of NET members must be the same for all stations that have the NET programmed.

To delete a NET member:

- From the main menu, select (**User Data**), then (**NETs**).
- Press ▲ or ▼ to scroll to the NET in which you want to delete a NET member, then press **OK**.
- Press ▼ to move to the **NET Members** entry.
- Press ▶ to view the list of NET members.
- Press ▲ or ▼ to scroll to the NET member that you want to delete.
- Delete other NET members from the **NET Members** entry, if required.
- Press (**Options**), scroll to **Delete**, then press (**Select**).

  If you want to delete all of the NET members, scroll to **Delete All**, then press (**Select**).
- Press (**Options**), scroll to **Save**, then press (**Select**).
- Press (**Close**).

Editing a NET

A

Editing a NET is similar to adding a NET.

To edit a NET:

- From the main menu, select (**User Data**), then (**NETs**).
- Press ▲ or ▼ to scroll to the NET that you want to edit, then press **OK**.
- Continue with the process for adding a NET.

Related links:

Adding a NET on page 295

Moving a NET

A

To move a NET:

- From the main menu, select (**User Data**), then (**NETs**).

- Press ▲ or ▼ to scroll to the NET that you want to move, press (**Options**), scroll to **Move**, then press (**Select**).
- Press ▲ or ▼ to scroll to the new location for the NET in the list, then press (**Place**).
- Press (**Close**).

Deleting a NET

To delete a NET:

- From the main menu, select (**User Data**), then (**NETs**).
- Press ▲ or ▼ to scroll to the NET that you want to delete, press (**Options**), scroll to **Delete**, then press (**Select**) to delete the NET.
- Press (**Close**).

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16 Messages

This section contains the following topics:

Overview of messages

If you want to re-use a message across a number of calls, or be able to select a message on-the-fly during a call, enter the text in one of the entries in **User Data** > **Messages**. You can set up a call to a contact to prompt you to enter or select a message at the time of the call.

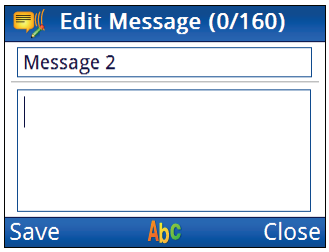
Related links:

Adding a contact on page 219
Making a Message call on page 60
Making an SMS call on page 74
Making a Web Message call on page 76

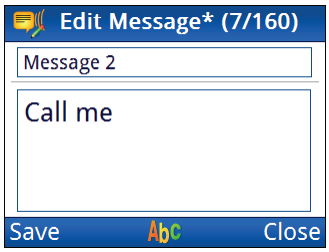
Entering a message

To enter a message:

- From the main menu, select (**User Data**), then (**Messages**).
- Press ▲ or ▼ to scroll to the **Message** entry that you want to edit.
- Press (**Edit**).



- *Hold* **#** to select a different input language, if required.
- Enter the message.



- Press (**Save**) to save the information.
- Press (**Close**).

Related links:

Entering text in a field on page 152
Entering a special character (2220/2230) on page 153
Entering text with the 2221 Handset on page 155
Entering text with a USB keyboard on page 156
Sending recognised keywords with a call on page 598

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17 Settings

This section contains the following topics:

Overview of settings

The settings contain all of the setup information that affects control points, general performance, connectors, scanning, calling, GPS, audio and encryption. Each area of information is grouped under an icon. Some of the icons or information in the workspace can only be viewed in advanced view and admin level.

Detailed information for each setting is provided on line in TPS System Programmer.

Settings > Control Point > General

The general settings for a control point enable you to customise the behaviour of the particular control point that you are operating.

NOTE: If you are entering text into a field in the control point, you may use characters from any of the supported languages.

Related links:

Welcome Image on page 307
Welcome Text on page 308
USB User Access on page 308
Channel Scroll on page 308
Channel Grouping on page 309
Show Channel Frequency on page 309
Frequency Format on page 309
Call Key Options on page 310
Night Display Brightness on page 310
Night Display Start on page 311
Night Display Stop on page 311
Local Welcome Text on page 311
Power-down Function on page 311
Brightness on page 317
Custom Brightness on page 318
Auto Dim Time on page 318
Key Beeps on page 318
Beeps and Tones on page 318
Local Speaker on page 319
Control Point Easitalk Start State on page 319
Theme on page 319
Night Theme on page 320
Show Background Image on page 320
Logging on page 320
Logging Level on page 320
Network Data Usage on page 321

Welcome Image

The **Welcome Image** entry sets the image that is shown on the screen during power up. The first image shown is the factory-set splashscreen, followed by the welcome image, if loaded. The image is added into a profile in TPS, then you select the portion of the image that you want to view at the control point in the preview window. You can also fit the image to the screen.

Once a welcome image is loaded into the transceiver via TPS System Programmer, it cannot be disabled via the control point. The image will be shown on the second restart of the transceiver following programming.

The welcome image may be .png or .jpg at a resolution of 320 × 240 pixels.

Default value: None

Welcome Text

The **Welcome Text** entry sets the text that is shown on the screen during power up. You can store up to three lines of text. Each line may have up to 20 characters of text.

If a welcome image is set, this image is shown first, followed by the welcome text. If text is entered in the **Local Welcome Text** entry, it overrides the text in the **Welcome Text** entry.

Default value: no selection

Related links:

Local Welcome Text on page 311

USB User Access

The **USB User Access** entry sets the actions that can be performed at user level when a memory stick is inserted in the USB connector on the control point.

NOTE: A profile is an electronic file that contains all the user-defined and operational settings that control a transceiver system.

If you want to enable the user to:

- load a profile into the transceiver, select **Program profile to transceiver**
- read a profile from the transceiver, select **Read profile from transceiver**
- upgrade the firmware in the transceiver, select **Firmware upgrade**
- upgrade the firmware in the RM50 module, select **RM50 firmware upgrade**
- program secure keys to the transceiver, select **Program secure keys to transceiver**

Default value: no selection

Channel Scroll

The **Channel Scroll** entry sets the direction in which the ▲ key scrolls through the channels, that is, to the next channel or the previous channel.

Available values: Go to next channel, Go to previous channel

Default value: Go to next channel

Channel Grouping

The **Channel Grouping** entry sets whether or not pre-defined groups of channels are shown on the channel screen. When channel grouping is enabled, the channel screen indicates that you are within a channel group by placing **...** in front of the channel name. When you scroll, you scroll through channels within that group. To change to another group *hold* **#**, scroll to the channel group that you want to use, then press **OK**. To toggle between the group name and the channels within the group, press **#**.

NOTE: If channel grouping is enabled you should consider showing the name of the channel group in one of the status areas.

Default value: Enabled

Related links:

Creating a macro to toggle a setting on page 279
Selecting information to be shown in a status area on page 31

Show Channel Frequency

The **Show Channel Frequency** entry sets whether or not frequencies are shown on the channel screen.

To show:

- both the transmit and receive frequencies, select **Yes**
- no frequencies, select **No**

Default value: Yes

Frequency Format

The **Frequency Format** entry sets the format in which frequencies are shown on the channel screen. These values change the number of decimal points that are shown.

If you want to show the frequency to:

- one decimal point, select **Show 100 Hz**
- two decimal points, select **Show 10 Hz**
- three decimal points, select **Show 1 Hz**

Default value: Show 100 Hz

CAUTION: If a frequency is entered to the nearest 1 Hz, but the frequency format is set to show the frequency on the screen to the nearest 100 Hz, rounding will occur.

NOTE: If you need to know the exact frequency of a channel, you can view this in **User Data** > **Channels**, then select the specific channel.

Call Key Options

The **Call Key Options** entry sets the default action that occurs when the **CALL** key is pressed on the control point. The screen that is not set as the default action is accessed using *hold* **CALL**.

If you want a press of the **CALL** key to:

- go to the Call screen, select **Show Call Screen**
- go to the Contacts screen, select **Show Contacts Screen**

Default value: Show Call Screen

Night Display Brightness

The **Night Display Brightness** entry sets the brightness of the LCD and keypad backlight during night-time activity.

Available values: Leave as is, Low, Medium, High

Default value: Low

Related links:

Night Display Start on page 311
Night Display Stop on page 311
Night Theme on page 320

Night Display Start

The **Night Display Start** entry sets the local time that you want the night-time brightness and night theme to start.

Range: 00.00 to 23.45 hour

Default value: 00.00

Night Display Stop

The **Night Display Stop** entry sets the local time that you want the night-time brightness and night theme to stop.

Range: 00.00 to 23.45 hour

Default value: 00.00

Local Welcome Text

The **Local Welcome Text** entry sets the welcome text for this control point only. This entry overwrites text entered into the **Welcome Text** entry. You can store up to three lines of text. Each line may have up to 20 characters of text.

Default value: no selection

Related links:

Welcome Text on page 308

Power-down Function

The **Power-down Function** entry sets whether or not powering down a control point also powers down the RFU.

NOTE: A link may be fitted across pins 1 and 2 on P901 on the Control and Audio PCB in the RFU (Codan part number 08-07158) that automatically restarts the RFU after power down.

The connection diagrams below show the basic operational scenarios. In the case of the 'cloud' diagrams, equipment such as an Ethernet switch, a LAN, a WAN with VPN, or Envoy SmartLink may be used to connect multiple control points to the RFU.

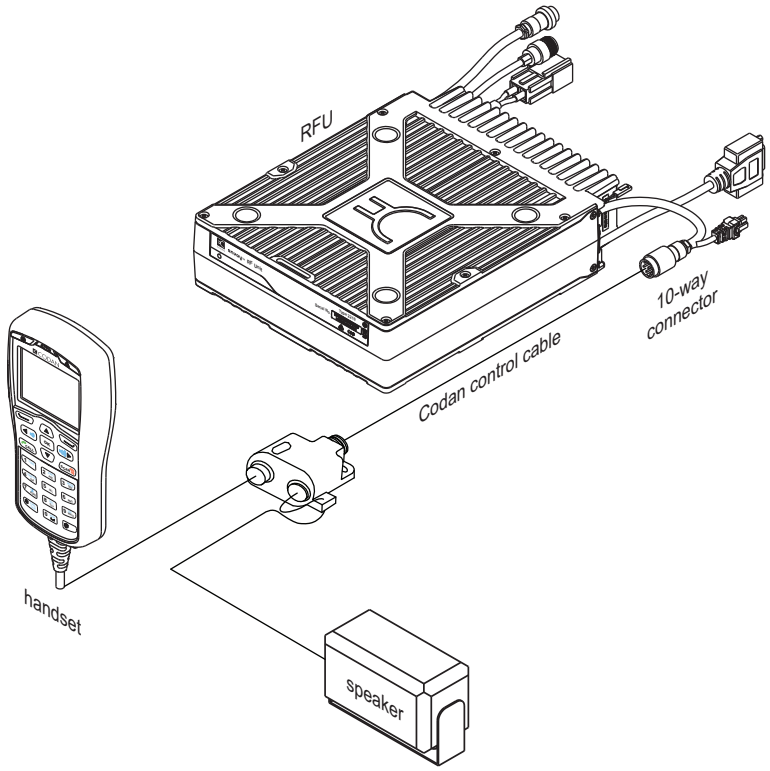
NOTE: For information on the Envoy SmartLink and requirements for separate power supplies, please see the *2240 Envoy SmartLink™ Reference Manual* (Codan part number 15-04168-EN).

If your control point-to-RFU connection:

- does not use Ethernet cabling, select **Control point and RFU**
- does use Ethernet cabling, select **Control point only**

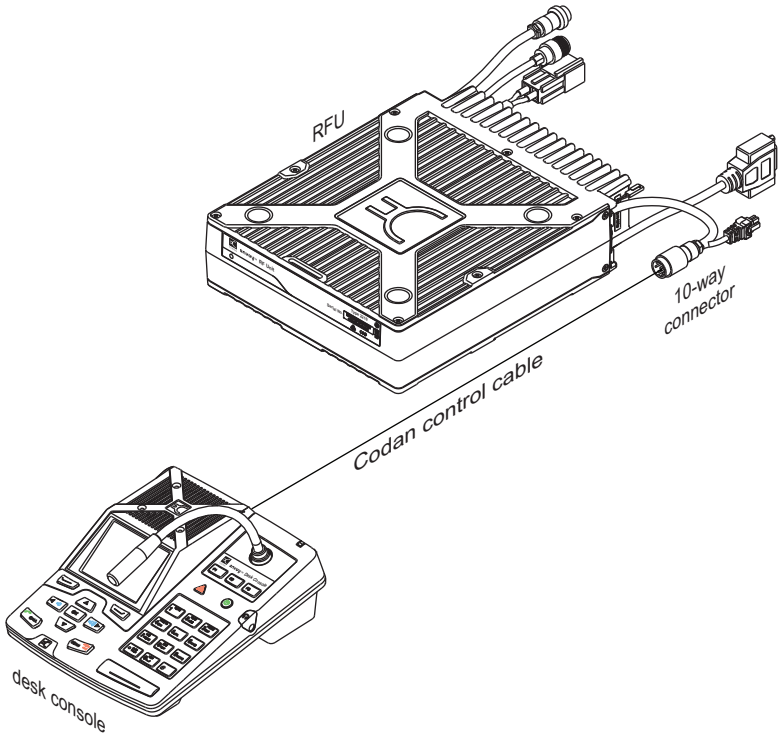
Default value: Control point and RFU

Figure 67: Handset connected via Codan control cable to RFU



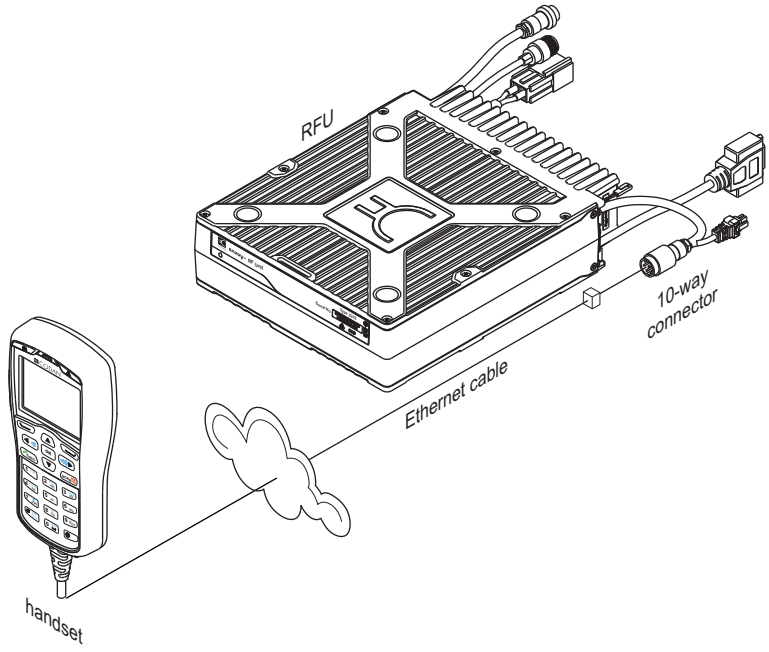
NOTE: You should select **Control point and RFU** for this scenario.

Figure 68: Desk console connected via Codan control cable to RFU



NOTE: You should select **Control point and RFU** for this scenario.

Figure 69: Handset connected via cloud and Ethernet cable to RFU

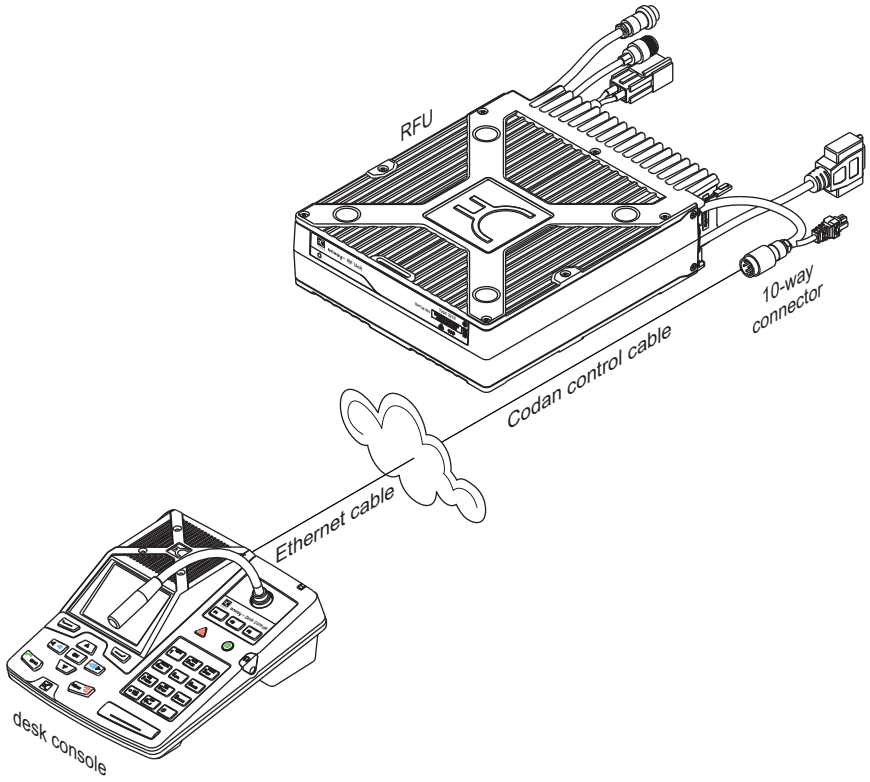


NOTE: You should select **Control point only** for this scenario.

NOTE: The cloud represents the Envoy SmartLink.

NOTE: For more information on systems that include an Envoy SmartLink, please see the *2240 Envoy SmartLink™ Reference Manual* (Codan part number 15-04168-EN).

Figure 70: Desk console connected via Ethernet cable to cloud and via Codan control cable to RFU



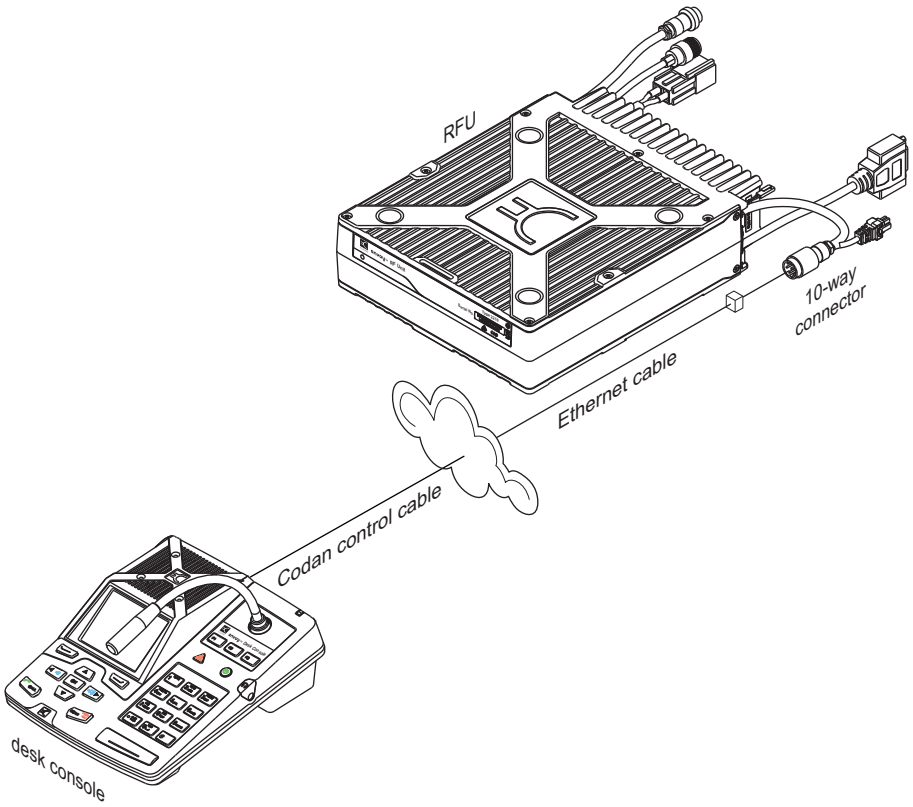
NOTE: You should select **Control point only** for this scenario.

NOTE: A desk console that is connected via Ethernet cabling to the RFU requires a separate power supply.

NOTE: The cloud represents the Envoy SmartLink or an Ethernet switch/LAN/WAN with VPN.

NOTE: For more information on systems that include an Envoy SmartLink, please see the *2240 Envoy SmartLink™ Reference Manual* (Codan part number 15-04168-EN).

Figure 71: Desk console connected via Codan control cable to cloud and via Ethernet cable to RFU



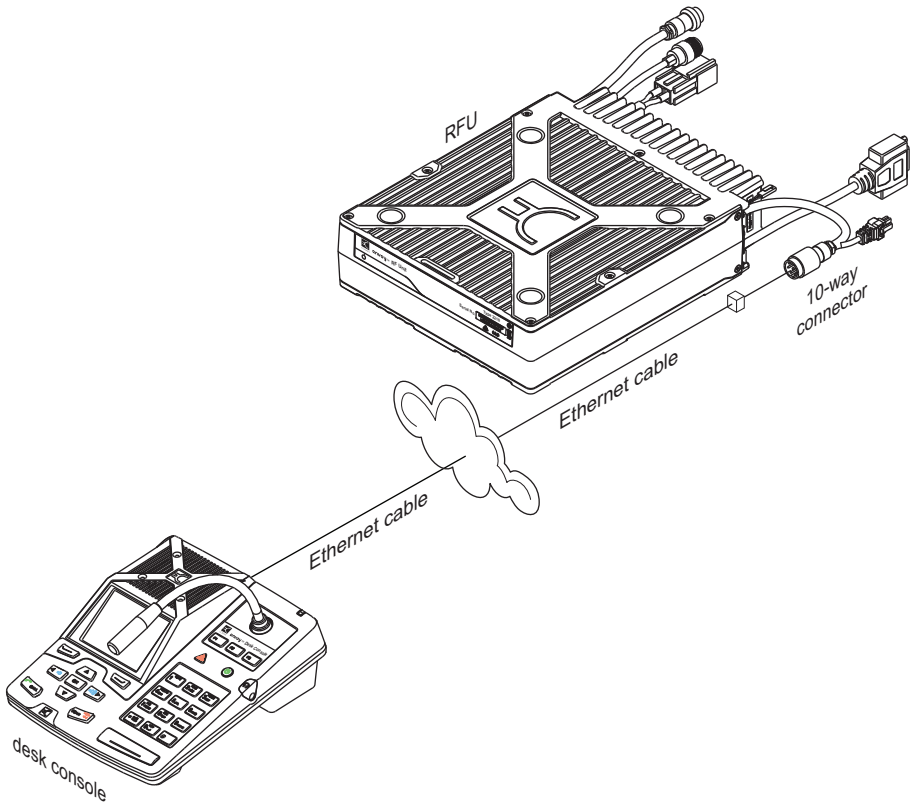
NOTE: You should select **Control point only** for this scenario.

NOTE: A desk console that is connected via Ethernet cabling to the RFU requires a separate power supply.

NOTE: The cloud represents the Envoy SmartLink or an Ethernet switch/LAN/WAN with VPN.

NOTE: For more information on systems that include an Envoy SmartLink, please see the *2240 Envoy SmartLink™ Reference Manual* (Codan part number 15-04168-EN).

Figure 72: Desk console connected via Ethernet cable to cloud and via Ethernet cable to RFU



NOTE: You should select **Control point only** for this scenario.

NOTE: A desk console that is connected via Ethernet cabling to the RFU requires a separate power supply.

NOTE: The cloud represents the Envoy SmartLink or an Ethernet switch/LAN/WAN with VPN.

NOTE: For more information on systems that include an Envoy SmartLink, please see the *2240 Envoy SmartLink™ Reference Manual* (Codan part number 15-04168-EN).

Related links:

Setting the power-down function of a control point on page 47
Fitting a link that restarts the RFU automatically on page 316

Fitting a link that restarts the RFU automatically

If your RFU is located in an isolated position, it may be useful to fit a link that automatically restarts it if it is switched off.

To fit the link:

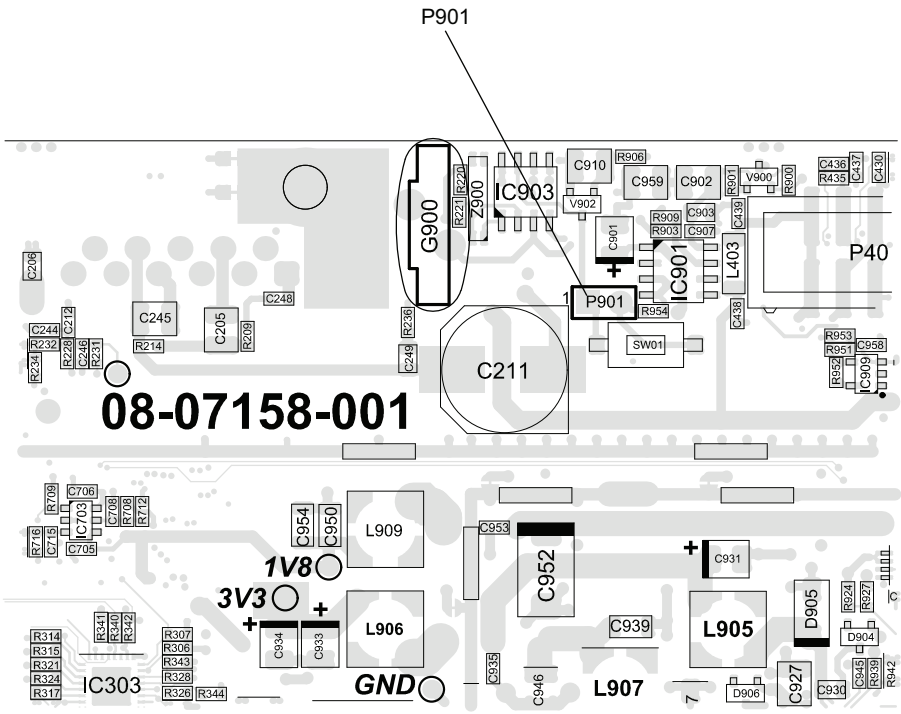
- Remove the top cover of the RFU.

- Locate the printed circuit board with the number 08-07158.

  This is the Control and Audio PCB.

- Place a jumper across P901.

Figure 73: Location of P901



- Position the top cover onto the chassis, ensuring that the gasket is in place, then screw into position.

Brightness

The **Brightness** entry sets the brightness of the LCD and keypad backlight.

To define a custom brightness level, select **Custom**, then enter the required brightness in the **Custom Brightness** entry.

Available values: Low, Medium, High, Custom

Default value: High

Related links:

Custom Brightness on page 318

Custom Brightness

The **Custom Brightness** entry sets the brightness of the LCD and keypad backlight if **Custom** is selected in the **Brightness** entry.

Range: 5 to 100

Default value: 50

Related links:

Brightness on page 317

Auto Dim Time

The **Auto Dim Time** entry sets the time the transceiver waits after a key is pressed before switching off the backlighting on the LCD and keypad of the control point. The backlighting is automatically switched on again when a key is pressed.

Available values: 5, 10, 20 min

Default value: 10 min

Key Beeps

The **Key Beeps** entry sets whether or not a beep is heard when a key is pressed.

When you press a key that is appropriate for the task you are performing, the transceiver makes a valid beep. When you press an inappropriate key, the transceiver makes an error beep.

Default value: Enabled

Beeps and Tones

The **Beeps and Tones** entry sets whether or not beeps and tones are heard at the transceiver for alerts and operational transitions.

If beeps and tones are switched off, the transceiver does not beep when it transitions between certain modes, for example, entering and exiting secure mode.

Default value: Enabled

NOTE: Alert tones on receipt of a call are set in **Settings** > **Calling** > **General** > **Alert Tones**.

Related links:

Alert Tones on page 343

Local Speaker

The **Local Speaker** entry sets whether or not the speaker associated with the control point is active.

Default value: Enabled

Control Point Easitalk Start State

The **Control Point Easitalk Start State** entry sets the state of *Easitalk* on the control point at power up.

If you want the control point to:

- return to the state it was in prior to the control point being switched off then on again, select **Leave as is**
- never use *Easitalk* at power up, select **Disabled**
- always use *Easitalk* at power up, select **Enabled**

Default value: Leave as is

Theme

The **Theme** entry sets the colour theme for the screen.

NOTE: You must restart the transceiver to activate a new theme.

Available values: Blue/Grey, Grey/Red, Grey/Blue, Blue/Green, Dark Blue, Military Light, Military Dark

Default value: Blue/Grey

Related links:

Selecting a theme on page 34

Night Theme

The **Night Theme** entry sets the colour theme for the screen during the night-time display times.

NOTE: You must restart the transceiver to activate a new theme.

Available values: Blue/Grey, Grey/Red, Grey/Blue, Blue/Green, Dark Blue, Military Light, Military Dark

Default value: Dark Blue

Related links:

Night Display Start on page 311
Night Display Stop on page 311
Night Display Brightness on page 310

Show Background Image

The **Show Background Image** entry sets whether or not the Envoy logo is shown in the background of menu and channel screens.

Default value: Enabled

Logging

The **Logging** entry sets whether or not event logging occurs on the control point.

Default value: Disabled

Logging Level

The **Logging Level** entry sets the level of event logging for debugging on the control point.

Range: 0 to 100

Default value: 50

Network Data Usage

The **Network Data Usage** entry sets the level of network bandwidth usage when scanning. When set to **Reduced**, and the transceiver is scanning with closed Selcall mute, no audio data is sent from the RFU to the control point. When set to **Normal**, and the transceiver is scanning with closed Selcall mute, audio data is sent from the RFU to the control point.

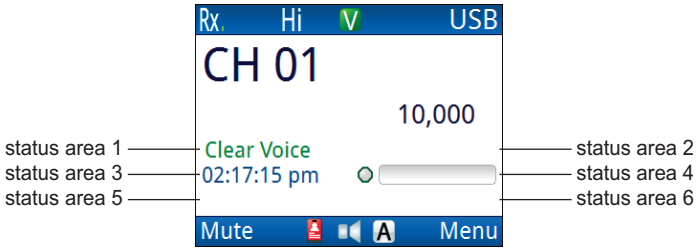
Default value: Normal

Settings > Control Point > Status Area

NOTE: The status area information that is set is common for all connected control points in a multiple control point system.

The status area settings for a control point enable you to customise the information that is shown on the channel screen of the control point that you are operating. There are six areas that can show information ranging from call information, address information, functional information, and user-defined text.

Figure 74: Status areas



NOTE: If you are entering text into a field in the control point, you may use characters from any of the supported languages.

Related links:

Selecting information to be shown in a status area on page 31
Status Area 1 on page 322
Status Area 2 on page 323
Status Area 3 on page 323
Status Area 4 on page 323
Status Area 5 on page 323
Status Area 6 on page 324
User-defined Text 1 on page 324
User-defined Text 2 on page 324

Status Area 1

The **Status Area 1** entry sets the information that is shown at the middle left of the screen. If a voice encryptor is active, the secure status overwrites your selection for this status area.

Default value: no selection

Status Area 2

The **Status Area 2** entry sets the information that is shown at the middle right of the screen. If a data encryptor is active, the secure status overwrites your selection for this status area.

Default value: no selection

Status Area 3

The **Status Area 3** entry sets the information that is shown just below the middle left of the screen.

Default value: Time

Status Area 4

The **Status Area 4** entry sets the information that is shown just below the middle right of the screen.

Default value: 2.4 kbit/s Data Modem throughput

NOTE: The throughput indicator is only shown if the 2.4 kbit/s Data Modem Interface option is enabled in the firmware.

Status Area 5

The **Status Area 5** entry sets the information that is shown at the bottom left of the screen.

Default value: Last received call

Status Area 6

The **Status Area 6** entry sets the information that is shown at the bottom right of the screen.

Default value: no selection

User-defined Text 1

The **User-defined Text 1** entry defines the text that you want to have shown on the screen. This text may be assigned to any of the status areas by selecting the User-defined Text 1 value for the status area. You may enter up to 16 alphanumeric characters.

Default value: no selection

User-defined Text 2

The **User-defined Text 2** entry defines the text that you want to have shown on the screen. This text may be assigned to any of the status areas by selecting the User-defined Text 2 value for the status area. You may enter up to 16 alphanumeric characters.

Default value: no selection

Settings > Control Point > Time and Date

The time and date settings for a control point enable you to set the time zone offset from UTC of the particular control point that you are operating, daylight saving differences, and time and date formats.

Related links:

GPS Time Sync on page 325
Time Zone on page 325
Daylight Saving on page 325
Clock Type on page 326
Time Format on page 326
Date Format on page 326
Setting the time and date on page 44

GPS Time Sync

The **GPS Time Sync** entry sets whether or not to synchronise system time with GPS time. The transceiver system time can be synchronised with GPS time, if a GPS receiver is installed and a minimum of four satellites are in view of the receiver. If the GPS Time Sync is enabled, any date and time set by the user via the transceiver User Interface will be overwritten by GPS time. If the installed GPS receiver supports multiple satellite navigation systems, the transceiver will use the resulting time output by the GPS receiver.

Default value: Enabled

Time Zone

The **Time Zone** entry sets the difference between the local time and UTC.

Default value: (+9:30) Adelaide

Daylight Saving

The **Daylight Saving** entry sets the changes from UTC due to daylight saving.

Available values: Standard time, Summer time

Default value: Standard time

Clock Type

The **Clock Type** entry sets the type of clock that is shown on the Time and Date screen to analogue or digital.

Default value: Analogue

Time Format

The **Time Format** entry sets whether the transceiver uses a 12-hour or 24-hour format.

Default value: 12 hour

Date Format

The **Date Format** entry sets the format in which the date is shown.

Available values: 1 Dec 2000, Dec 1, 2000, 1-12-2000, 12-1-2000, 1/12/2000, 12/1/2000

Default value: 1 Dec 2000

Settings > Control Point > Console

NOTE: This tab is visible if you have a 2230 Desk Console connected as a control point.

The console settings for a control point enable you to customise the behaviour of the desk console that you are using as the control point.

Related links:

Console PTT on page 327
Foot-switch PTT on page 327
Console External Alarm on page 327

Console PTT

The **Console PTT** entry sets the audio source for the console PTT on the desk console to either an internal or external microphone.

Default value: Internal microphone

Foot-switch PTT

The **Foot-switch PTT** entry sets the audio source for the foot-switched PTT on the desk console to either an internal or external microphone.

Default value: Internal microphone

Console External Alarm

The **Console External Alarm** entry sets whether the alarm output on the GP port is enabled or disabled.

The external alarm is a relay that can be wired by a user to ring a bell or to sound a car horn.

Default value: Enabled

Settings > Configuration > General

The general configuration settings enable you to customise underlying operational items that affect the behaviour of the transceiver. These include power levels, access, noise and detection sensitivities, and a number of general timeouts.

Related links:

Admin PIN on page 328
Noise Limiter on page 328
Voice Detect Sensitivity on page 329
Power Down Timeout on page 329
Power Down Time on page 329
Easitalk Mode on page 330
RF Pre-amp on page 330
Tx Power on page 330
Low Power on page 331
Medium Power on page 331
High Power on page 331
Easitalk Start State on page 331
Default Selcall on page 332
Handset AGC on page 332
Handset PTT Beep on page 332
System Lock Override on page 333
Morse Timeout on page 333
PTT Timeout on page 333
Units on page 333
Abandon Mode on page 334
Command Line on page 334
CICS Over IP on page 334
VCOM CICS Startup on page 334

Admin PIN

The **Admin PIN** entry stores a numeric password (up to 8 digits) for access to admin level in the transceiver.

Default value: no selection

Noise Limiter

The **Noise Limiter** entry sets whether or not the noise limiter circuit is active.

The noise limiter reduces background impulse noise and ignition noise from cars.

Default value: Enabled

Voice Detect Sensitivity

The **Voice Detect Sensitivity** entry sets the sensitivity required for voice detection in the operating environment. In noisy operating environments you may want to decrease the sensitivity so that mute does not open on general noise.

Range: 1 to 55

Default value: 20

Power Down Timeout

The **Power Down Timeout** entry sets the length of inactivity after which the transceiver powers down.

CAUTION: If a link is fitted to P901 on the Control and Audio PCB in the RFU (Codan part number 08-07158), or cable 08-07215-001 is used in the system, the RFU restarts automatically after power down.

Range: Disabled, 1 to 10 hour

Default value: Disabled

Power Down Time

The **Power Down Time** entry sets the local time at which the transceiver powers down.

NOTE: You must switch the transceiver off then on again for this value to be activated.

CAUTION: If a link is fitted to P901 on the Control and Audio PCB in the RFU (Codan part number 08-07158), or cable 08-07215-001 is used in the system, the RFU restarts automatically after power down.

Default value: Disabled

Easitalk Mode

The **Easitalk Mode** entry selects a noise-reduction algorithm.

Available values: None, Cepstral, Spectral, MMSE

Default value: Cepstral

RF Pre-amp

The **RF Pre-amp** entry switches the RF pre-amplifier on or off.

If you want to:

- increase the receive sensitivity of the RFU, select **Enabled**
- reduce the receive sensitivity of the RFU, select **Disabled**

Default value: Enabled

Tx Power

The **Tx Power** entry sets the power preference to suit the transmit power level for your station.

Available values: Low, Medium, High

Default value: High

NOTE: The low, medium and high power levels may be defined using the **Low Power**, **Medium Power**, and **High Power** entries.

NOTE: The **Power** entry for a channel overrides this setting.

Related links:

Low Power on page 331
Medium Power on page 331
High Power on page 331
Power on page 174

Low Power

The **Low Power** entry enables you to set the power level that is used when the **Tx Power** entry is set to **Low**.

Range: 1 to 30 watt

Default value: 10 watt

Related links:

Tx Power on page 330

Medium Power

The **Medium Power** entry enables you to set the power level that is used when the **Tx Power** entry is set to **Medium**.

Range: 31 to 60 watt

Default value: 50 watt

Related links:

Tx Power on page 330

High Power

The **High Power** entry enables you to set the power level that is used when the **Tx Power** entry is set to **High**.

Range: 61 to 125 watt

Default value: 125 watt

Related links:

Tx Power on page 330

Easitalk Start State

The **Easitalk Start State** entry sets the state of *Easitalk* at power up.

If you want the transceiver to:

- return to the state it was in prior to the transceiver being switched off then on again, select **Leave as is**
- never use *Easitalk* at power up, select **Disabled**
- always use *Easitalk* at power up, select **Enabled**

Default value: Leave as is

Default Selcall

The **Default Selcall** entry sets the default Selcall call system when adding HF networks.

Available values: Codan, Open

Default value: Codan

Handset AGC

The **Handset AGC** entry sets the rate of action of AGC for the input signal to the handset.

To optimise AGC for:

- voice signals, select **Slow**
- special modes and morse code in a noisy environment, select **Fast**
- voice and modem signals, select **Hold**

Default value: Hold

Handset PTT Beep

The **Handset PTT Beep** entry sets whether or not astrotones are transmitted when the PTT button is released during a call. This saves you having to say ‘over’ each time you release PTT.

Default value: Enabled

System Lock Override

The **System Lock Override** entry sets how various actions at the control point interact with a system lock.

If you want the control point to:

- always override other PTT sources and system locks, select **Always**
- never override other PTT sources or system locks, select **Never**
- ask the user if they want to override other PTT sources and system locks, select **Prompt**

Default value: Prompt

Morse Timeout

The **Morse Timeout** entry sets the length of time from the last morse activity after which PTT is released.

Range: 50 to 1000 msec

Default value: 250 msec

PTT Timeout

The **PTT Timeout** entry sets the length of time that PTT may be held down before the transceiver ceases transmission and switches to receive. This ensures that, even if PTT is held down accidentally (because, for example, you are sitting on the handset), power consumption is minimised and the transceiver is ready to receive calls.

Range: Off, 1 to 30 min

Default value: 10 min

Units

The **Units** entry sets the default system of units for temperature and distance measurements.

Available values: Metric, Imperial

Default value: Metric

Abandon Mode

The **Abandon Mode** entry sets how the transceiver shuts down following the ⏻ + ⚠ hot-key sequence.

If you want the transceiver to:

- not respond to the abandon hot-key sequence, select **Never**
- shut down and only be accessed by an administrator (if an admin PIN is set), select **Lock**
- erase all CES secure keys, AES secure keys, frequency hopping plans, channels, HF networks, NETs, phone links, contacts, self addresses, call logs, messages, welcome text, site manager information, and LQA information, then admin lock, select **Erase**
- respond to the user Erase or Lock option run-time selection, select **Choose**

Default value: Never

Related links:

Abandoning your transceiver on page 124

Command Line

The **Command Line** entry is for future use.

CICS Over IP

The **CICS Over IP** entry sets whether or not a CICS session is allowed on the RFU network interface over a remote telnet connection on port 23.

Default value: Disabled

VCOM CICS Startup

The **VCOM CICS Startup** entry sets the serial commands that you want to have performed by the port following startup.

Typically, this is used for specific commands that are required in a system that uses CICS commands. For example, you could set the self address of the peripheral device connected to the VCOM CICS port.

NOTE: You must switch the transceiver off then on again to activate the new value.

Default value: no selection

Settings > Configuration > Factory

These settings are read-only, however, you may be interested in viewing the various limits.

Settings > Connectors

The connector settings for the transceiver are set automatically according to the requirements of the peripheral device connected. When a peripheral device is selected, the entries that you can customise appear for the particular connector.

Related links:

Peripherals on page 233

Settings > Scan

The scan settings enable you to set how the transceiver scans, what happens after a period of inactivity or the end of a call, and how the mute behaves when voice is detected.

Related links:

Auto Resume Mode on page 338
Auto Resume Time on page 338
Scan Mute on page 338
Scan Voice Extend on page 339
Scan Voice Max Pause on page 339

Auto Resume Mode

The **Auto Resume Mode** entry sets the action performed when the auto resume time ends.

The transceiver may be set to automatically begin a task when scanning is switched off and there has been no PTT, channel change, scan on/off, mute on/off, or call sending activity for a certain length of time.

If you want the transceiver to:

- remain on a channel, select **Disabled**
- close the link to end any call in progress and, if it was scanning prior to the call, resume scanning, select **Close link**
- start scanning, select **Start scan**

Default value: Start scan

Auto Resume Time

The **Auto Resume Time** entry sets the length of time after no activity that the transceiver performs the action set in the **Auto Resume Mode** entry.

Range: 1 to 20 min

Default value: 2 min

Scan Mute

The **Scan Mute** entry sets the mute type used when the **Auto Resume Mode** entry is set to **Start Scan**.

If you want the transceiver to:

- scan for voice and calls addressed to your station, select **Voice and calls**
- scan only for calls addressed to your station, select **Calls**
- scan according to the current mute state, select **Leave as is**

Default value: Calls

Scan Voice Extend

The **Scan Voice Extend** entry sets the period of time that the transceiver pauses scan when voice is detected. The transceiver continues to extend by this amount each time voice is detected on the channel, up to the maximum hold period set in the **Scan Voice Max Pause** entry.

If you do not want the transceiver to pause scan after voice is detected, set this entry to 0.

Range: 0 to 30 sec

Default value: 5 sec

Scan Voice Max Pause

The **Scan Voice Max Pause** entry sets the maximum length of time that the transceiver pauses on a channel after voice is detected.

Range: 0 to 120 sec

Default value: 5 sec

Settings > Calling > General

The general calling settings enable you to set up how the transceiver behaves when it receives certain calls, and how it performs an action when activity is detected on a channel that you want to use. The general calling settings also include a number of alarms and timeouts.

Related links:

Call Types For Contacts on page 340
Call Types For New Call on page 341
Show Phone Link Address on page 341
Emergency Call Alarm on page 342
Message Call Alarm on page 342
Selective Call Alarm on page 342
External Alarm on page 343
Alert Tones on page 343
Call Status Time on page 344
Chain Call Pause on page 344
In Call Timeout on page 344
LBT Mode on page 345
LBT Period on page 345
LBT Data Sensitivity on page 346
LBT Waveform on page 346
Priority Messages on page 346
Respond GPS on page 347
Respond OTA on page 348
Selcall Accept Group Call on page 348
Selcall Phone Channel Test on page 349
Emergency Open Mic on page 349
Calling Lock Override on page 349

Call Types For Contacts

The **Call Types For Contacts** entry sets the call types that are available for selection when adding or editing call information for a contact.

Available values: Selective, Channel Test, Message, Get Position, Send Position, Phone, SMS, Get Status, Emergency, RFDS Emergency, Marine Emergency, ALE Sounding, Web Message, Global Message.

NOTE: The call types available depend on the options installed in your transceiver.

NOTE: When upgrading the installed Envoy transceiver with the firmware version 2.01, please ensure that you change this setting to include SMS and Web Message call type.

Default value: all available call types selected

Related links:

Adding a contact on page 219
Call types on page 574

Call Types For New Call

The **Call Types For New Call** entry sets the call types that are available for selection when making a new call.

Available values: Selective, Channel Test, Message, Get Position, Send Position, Phone, SMS, Get Status, Emergency, RFDS Emergency, Marine Emergency, ALE Sounding, Web Message, Global Message.

NOTE: The call types available depend on the options installed in your transceiver.

NOTE: When upgrading the installed Envoy transceiver with the firmware version 2.01, please ensure that you change this setting to include SMS and Web Message call type.

Default value: all available call types selected

Related links:

Call types on page 574

Show Phone Link Address

The **Show Phone Link Address** entry sets whether or not the address of a phone link is shown on the screen during a Phone call.

A phone link is the information defining the connection of a remote HF transceiver to a telephone station. A telephone station comprises a transceiver system and a radio/telephone interconnect unit that can route Phone calls from HF transceivers to the public telephone network. The address setting in a phone link is the address of the transceiver connected to the radio/telephone interconnect, or the address of the radio/telephone interconnect.

Default value: Disabled

Related links:

Adding a phone link on page 210

Emergency Call Alarm

The **Emergency Call Alarm** entry sets the delay between receiving an Emergency call and sounding the external alarm.

The external alarm is a relay that can be wired by a user to ring a bell or to sound a car horn. By default, the external alarm relay reacts immediately, continuing for five minutes.

Available values: Never, Immediate, 10 sec, 30 sec

Default value: Immediate

Related links:

GP port connector on page 507

Message Call Alarm

The **Message Call Alarm** entry sets the delay between receiving a Message call and sounding the external alarm.

The external alarm is a relay that can be wired by a user to ring a bell or to sound a car horn. If the external alarm is sounded for messages, it continues for two minutes.

By default, the external alarm is not activated for any Message calls or calls containing messages.

Available values: Never, Immediate, 10 sec, 30 sec

Default value: Never

Related links:

GP port connector on page 507
Alert Tones on page 343

Selective Call Alarm

The **Selective Call Alarm** entry sets the delay between receiving a voice call and sounding the external alarm.

The external alarm is a relay that can be wired by an installer to ring a bell or to sound a car horn. By default, the alarm delays for 10 sec before sounding. This may be useful when the transceiver is not closely monitored, but an operator is able to respond to a local alert tone within 10 seconds. If the call is not answered after this time, the external alarm is sounded.

The external alarm is sounded continuously for two minutes.

Available values: Never, Immediate, 10 sec, 30 sec

Default value: 10 sec

Related links:

GP port connector on page 507

External Alarm

The **External Alarm** entry sets whether the alarm output on the GP port is enabled or disabled.

The external alarm is a relay that can be wired by a user to ring a bell or to sound a car horn.

Default value: Enabled

Related links:

GP port connector on page 507

Alert Tones

The **Alert Tones** entry sets whether or not the transceiver gives an alert tone (beep, or ring if an external alarm is connected) when it receives a message or a non-message call.

If you want the transceiver to:

- provide a local alert tone and external alarm when it receives any type of call, select **Normal**
- not provide a local alert tone or external alarm when it receives a message call, select **Messages do not ring**
- not provide a local alert tone or external alarm when it receives any type of call, select **Disabled**

Default value: Normal

Call Status Time

The **Call Status Time** entry sets the additional time a called transceiver has to respond to a Get Status call with the information requested. The calling station sends this time with the call. The called transceiver automatically adds 45 sec to this time, after which it hangs up the call if it does not have an appropriate response to send.

NOTE: Check that the value set in **Settings** > **Scan** > **Auto Resume Time** does not conflict with the value set in this entry.

Range: 0 to 255 sec

Default value: 10 sec

Related links:

Auto Resume Time on page 338

Chain Call Pause

The **Chain Call Pause** entry sets the length of time the transceiver pauses between chained calls.

A chain call is started when you *hold* the ⚠ key for 2 sec. The transceiver makes the first call defined in the emergency contact that you select, waits the pause time, then makes the next call defined in the same emergency contact, and so on, until it makes the last call defined for this emergency contact.

Range: 0 to 60 sec

Default value: 30 sec

Related links:

Call types on page 574
Calling on page 48

In Call Timeout

The **In Call Timeout** entry sets the length of time:

- during which an incoming call may be answered before it is hung up automatically
- after which an incoming call pop-up changes to a missed call pop-up

Range: 0 to 300 sec

Default value: 30 sec

Related links:

Call types on page 574
ALE address syntax on page 585

LBT Mode

The **LBT Mode** entry sets whether or not the transceiver listens for calls and traffic on a channel before starting a call.

The transceiver is capable of listening to a channel before initiating a call on the channel. If the **LBT Mode** entry is set to **Enabled**, the transceiver detects whether or not there is traffic on the selected channel. The transceiver listens on a channel for the length of time specified in the **LBT Period** entry. If there is traffic on the channel, the transceiver reports that the channel is occupied.

If you want the transceiver to:

- not test channels used for making calls, select **Disabled**
- test channels using LBT for every call, select **Enabled**
- test channels using LBT for every call, with the option to override, select **Override allowed**

  NOTE: Detected ALE transmissions are not overridden in accordance with the MIL-STD-188-141B ALE standard.

Default value: Disabled

CAUTION: Calls using the Emergency call type or calls made through the ⚠ key override the **LBT Mode** entry if it is enabled at either level.

LBT Period

The **LBT Period** entry sets the length of time that the transceiver listens for calls and traffic on a channel before starting a call.

Range: 1 to 10 sec

Default value: 2.0 sec

LBT Data Sensitivity

The **LBT Data Sensitivity** entry sets the sensitivity level for detection of false or weak data signals when LBT is active. In noisy operating environments you may want to decrease the sensitivity so that LBT does not detect general noise.

Range: –0.500 to +0.500 sec

Default value: 0.0 sec

LBT Waveform

The **LBT Waveform** entry sets the type of waveform that LBT monitors.

If you want outgoing calls to monitor the channel for:

- voice calls, or any call to another station made using a Selcall or ALE/CALM HF network, select **Voice and calls**
- voice calls, any call to another station made using a Selcall or ALE/CALM HF network, or any calls made via a data modem, select **Voice, calls and data**

Default value: Voice and calls

Priority Messages

The **Priority Messages** entry sets the actions performed on receiving messages starting with '!' or '!!'.

NOTE: Messages starting with '!' or '!!' are called Priority messages. Priority messages are supported for in-link messages, Selcall and ALE message calls as well as ALE selective calls with an attached message.

NOTE: A message with a single leading '!', excluding leading white spaces, is treated as an Urgent message. On reception of this Priority message, the emergency tone is played in a pattern of 2 seconds of tone and 5 seconds of silence, in addition, the console and/or RFU GP port alarm relay will toggle in the same pattern (high for 2 sec, low for 5 sec), until the incoming message is acknowledged by pressing a key on a control point.

NOTE: A message with two leading '!!', excluding leading white spaces, will be treated as an Emergency message. On reception of this Priority message, an emergency tone is played and the RFU and/or Console GP port alarm relay stays high, until the incoming message is acknowledged by pressing a key on a control point.

If you want the transceiver to:

- treat messages formatted as Priority messages as normal messages, select **Disabled**
- treat encrypted and non-encrypted incoming messages starting with '!' or '!!' as Priority messages, select **Enabled**
- treat only encrypted incoming messages starting with '!' or '!!' as Priority messages select **Encrypted Only**

Default value: Disabled

NOTE: A non-encrypted message is a message sent using an HF Network with Privacy Mode set **None** or **Plain**.

NOTE: An encrypted message is a message sent using an HF Network with Privacy Mode set to **Group**.

Respond GPS

The **Respond GPS** entry sets the way in which the transceiver handles its response to a Get Position call sent through an ALE/CALM or Selcall HF network.

If you want to:

- respond to a Get Position call regardless of the privacy mode of the HF network through which the call was made, select **Always respond**
- respond in a proprietary Codan-encoded format to a Get Position call in an HF network with the privacy mode set to **Group** or **None**, select **To Codan requests**
- respond to a Get Position call from another Codan HF transceiver in an HF network with the privacy mode set to **Group** and a common privacy key, select **To encrypted requests**
- disable your response to any Get Position call, select **Never respond**

Default value: Always respond

NOTE: The **To Codan requests** value specifically excludes calls made using an Open Selcall HF network, and calls made using an ALE/CALM HF network with a privacy mode of **Plain** (MIL-STD-188-141B ALE option).

NOTE: You are still able to make Send Position calls if this entry is set to **Never respond**.

NOTE: To respond to Get Position calls made in an Open Selcall HF network, the **Respond GPS** entry must be set to **Always respond**.

Related links:

Privacy mode on page 200

Respond OTA

The **Respond OTA** entry sets the way in which the transceiver handles its response to an OTA command sent through an ALE/CALM or Selcall HF network.

If you want to:

- respond to an OTA command regardless of the privacy mode of the HF network through which the call was made, select **Always respond**
- respond in a proprietary Codan-encoded format to an OTA command in an HF network with the privacy mode set to **Group** or **None**, select **To Codan requests**
- respond to an OTA command from another Codan HF transceiver in an HF network with the privacy mode set to **Group** and a common privacy key, select **To encrypted requests**
- disable your response to any OTA command, select **Never respond**

Default value: To Codan requests

NOTE: The **To Codan requests** value specifically excludes calls made using an Open Selcall HF network, and calls made using an ALE/CALM HF network with a privacy mode of **Plain** (MIL-STD-188-141B ALE option).

NOTE: To respond to Get Status calls made in an Open Selcall HF network, the **Respond OTA** entry must be set to **Always respond**.

For more information on OTA commands contact your Codan representative.

Related links:

Privacy mode on page 200

Selcall Accept Group Call

The **Selcall Accept Group Call** entry sets whether or not your transceiver accepts and responds to group-addressed calls that it detects in a Selcall HF network. For example, if your station's 4-digit address is 1245 or its 6-digit address is124578, and a group call is made by a remote station to 12.. or 12.... respectively, your transceiver will answer the call if this entry is set to **Enabled**.

Default value: Enabled

Related links:

Group calls in a Codan Selcall HF network on page 596

Selcall Phone Channel Test

The **Selcall Phone Channel Test** entry sets whether or not your transceiver with a telephone interconnect attached as a peripheral device responds with Channel Test revertives to a 4-digit XX99 or 6-digit XXXX99 Selective call.

Envoy transceivers that are deployed in a telephone station may receive beacon calls from older Codan transceivers and third-party transceivers that test the quality of the channel by sending a beacon to an XX99 or XXXX99 address. If this entry in the Envoy transceiver is set to **Enabled** and there is a contact named **QD 99** with a blank Phone call set up, the Envoy transceiver responds to this beacon with the standard Channel Test call revertive.

Default value: Disabled

Related links:

Setting up an Envoy telephone station for compatibility with older transceivers on page 241

Emergency Open Mic

The **Emergency Open Mic** entry sets sets whether the Control Point's microphone is automatically opened after establishing a link for a Selective or Emergency call within an emergency chain call. The duration for which the microphone is opened is controlled by the value of the **Chain Call Pause** setting (default 30 seconds).

Default value: Disabled

Related links:

Chain Call Pause on page 344

Calling Lock Override

The **Calling Lock Override** entry sets whether or not a user at this control point is prompted to override a calling lock taken by another control point. This entry is used to control activity during calling when multiple control points are used with the same RFU. Control points that have the same self address registered may take control of a call at any stage. Control points that have a different self address registered from the address that has the lock need to override this lock to take control.

NOTE: You can only override calls made via other control points. You cannot override calls made via a 3033 Telephone Interconnect or 3031 Crosspatch.

If you want the operator to:

- always override a lock taken for a call by another control point, select **Always**
- be asked if they want to override a lock taken for a call by another control point, select **Prompt**
- not be able to override a lock taken for a call by another control point, select **Never**

Default value: Prompt

Settings > Calling > ALE

NOTE: These settings may be visible if the FED-STD-1045 ALE or MIL-STD-188-141B ALE option is installed.

The ALE calling settings enable you to set up how the transceiver behaves when it is making and receiving calls in an ALE/CALM HF network, and how link quality information is managed.

Related links:

ALE LQA Average on page 351
ALE LQA Decay on page 352
ALE Site Manager on page 353
ALE Accept ALL Call on page 355
ALE Accept ANY Call on page 355
ALE Accept Wildcard Call on page 356
ALE AMD Position on page 356
ALE BER on page 357
ALE Call Scan on page 357
ALE Scan Cycles on page 358
ALE Call Threshold on page 358
ALE Call Weighting on page 359
ALE Golay on page 360
ALE Hangup ALL Call on page 360
ALE Hangup Phone Call on page 361
ALE Hangup Voice Call on page 361
ALE LQA Exchange on page 362
ALE LQA Mapping on page 362
ALE Retries on page 363
ALE Selective Message on page 363
ALE Silent Mode on page 363
ALE Soundings on page 364

ALE LQA Average

NOTE: This entry is available if you have the FED-STD-1045 ALE or MIL-STD-188-141B ALE option installed.

The **ALE LQA Average** entry selects the way that LQA information is used when recording signal quality.

When the transceiver periodically tests the quality of the channels in an HF network, it stores the results for future use. The transceiver uses an averaging method to reduce the effect that the new reading may have on the current channel values. The **ALE LQA Average** entry enables you to select the averaging method used.

If you want to:

- disable the averaging feature and replace the old results with the new results, select **New**
- replace the old results with the average of the old and new results, select **Both**
- retain 75% of the old results and use 25% of the new, select **Mostly old**
- retain 87.5% of the old results and use 12.5% of the new, select **Old**

Default value: Both

CAUTION: LQA information gathered by the calling station during a Channel Test call in an ALE/CALM HF network (MIL-STD-188-141B ALE option) *replaces* any information stored for the channels and stations detected during the call.

ALE LQA Decay

NOTE: This entry is available if you have the FED-STD-1045 ALE or MIL-STD-188-141B ALE option installed.

The **ALE LQA Decay** entry sets the length of time it takes for LQA information to artificially decay, or switches off this feature.

When your transceiver periodically records the quality of the channels in an HF network, it stores the results for future use. Several factors can affect the accuracy of these results including:

- an insufficient number of ALE sounding transmissions being made in the HF network
- an insufficient number of ALE calls being made, which prevents the transceiver from exchanging channel quality information with other transceivers
- stations moving their location
- antenna loading, nearby physical structures, and local noise for stations mounted in vehicles

These factors can lead to the deterioration of good channels going unnoticed. To avoid this, the **ALE LQA Decay** entry artificially decays channel quality information over time. This forces the transceiver to continually work against the artificial decay to maintain an accurate picture of channel quality that does not overestimate actual conditions.

For mobile stations, the recommended decay period is 1 to 4 days. For fixed base stations, the recommended decay period is 15 to 30 days.

Default value: 15 day

ALE Site Manager

NOTE: This entry is available if you have the FED-STD-1045 ALE or MIL-STD-188-141B ALE option installed.

The **ALE Site Manager** entry enables the transceiver to collect information on other transceivers with which it communicates. The following information may be gathered, depending on the value set for the **ALE Site Manager** entry:

- the ESN of the remote transceiver
- any other self addresses in the remote transceiver that are associated with ALE/CALM HF networks
- the tuning time of the remote transceiver's antenna

It requests this information up to three times when the **ALE Site Manager** entry is set to **Auto**, and only Codan HF transceivers in which the FED-STD-1045 ALE/CALM or MIL-STD-188-141B ALE option is installed can respond.

NOTE: If the **ALE Silent Mode** entry is set to **Enabled**, the transceiver does not respond *automatically* to requests from other stations for site information.

If you want the transceiver to:

- only accept site information that is broadcast by other stations, select **Disabled**
- accept, respond to, and automatically initiate requests for site information, select **Auto**
- accept site information, respond to requests for site information, and allow manually initiated Broadcast Site and Request Site Get Status calls to other stations, select **Manual**
- accept site information and allow manually initiated Broadcast Site and Request Site Get Status calls to other stations, but not respond to requests for site information, select **Restricted**

Default value: Auto

CAUTION: If more than one self address is available at a remote site, for example, one for the control point and another for a MIL/STANAG 2G Data module and the **ALE Site Manager** entry is set to **Manual**, it is recommended that you make a Request Site Get Status call to update the LQA site information correctly.

The information collected:

- enables your transceiver to optimise calls to the other transceiver by adjusting the time taken to wait for the antenna to tune
- enables you to set a longer sounding interval

NOTE: Regardless of the value set, your transceiver always updates the site manager information that is broadcast from other stations.

Details of each value are provided in the table below.

Table 13: Values for the ALE Site Manager entry

Value	Description
Disabled	Your transceiver accepts site manager information that is broadcast from other stations. Your transceiver does not respond to requests for site manager information. You cannot broadcast your site manager information to other stations. You cannot request site manager information from other stations.
Auto	Your transceiver accepts site manager information that is broadcast from other stations. Your transceiver *automatically* initiates requests for site manager information from unknown addresses with which it links. Your transceiver broadcasts its self addresses *automatically* in response to requests from other stations. Your transceiver broadcasts its self addresses when it receives a Request Site Get Status call from another station. Your transceiver broadcasts its self addresses when you make a Broadcast Site Get Status call. Your transceiver requests site information from other stations when you make a Request Site Get Status call.
Manual	Your transceiver accepts site manager information that is broadcast from other stations. Your transceiver broadcasts its self addresses *automatically* in response to requests from other stations. Your transceiver broadcasts its self addresses when it receives a Request Site Get Status call from another station. Your transceiver broadcasts its self addresses when you make a Broadcast Site Get Status call. Your transceiver requests site information from other stations when you make a Request Site Get Status call.
Restricted	Your transceiver accepts site manager information that is broadcast from other stations. Your transceiver broadcasts its self addresses when you make a Broadcast Site Get Status call. Your transceiver requests site information from other stations when you make a Request Site Get Status call.

NOTE: If your HF network consists of only a few Codan HF transceivers with the FED-STD-1045 ALE/CALM option installed and many other transceivers, you may want to set the **ALE Site Manager** entry to **Disabled** or **Manual** to reduce HF network traffic.

ALE Accept ALL Call

NOTE: This entry is available if you have the FED-STD-1045 ALE or MIL-STD-188-141B ALE option installed.

The **ALE Accept ALL Call** entry sets whether or not your transceiver accepts ALL calls that it detects.

ALL calls are not addressed to a specific station. If your station detects a call with a matching ALL address syntax, it enters the linked state and alerts the operator. If you do not want to receive either global or selective ALL calls, disable this feature.

Default value: Enabled

Related links:

ALE address syntax on page 585
ALL call on page 585

ALE Accept ANY Call

NOTE: This entry is available if you have the MIL-STD-188-141B ALE option installed.

The **ALE Accept ANY Call** entry sets whether or not your transceiver accepts and responds to ANY calls that it detects.

ANY calls are not addressed to a specific station. If your station detects a call with a matching ANY address syntax, it sends a response in a random slot to the calling station. Your station enters a link when it receives an acknowledgement from the calling station. If you do not want to receive either global or selective ANY calls, disable this feature.

Default value: Enabled

Related links:

ALE address syntax on page 585
ANY call on page 586

ALE Accept Wildcard Call

NOTE: This entry is available if you have the MIL-STD-188-141B ALE option installed.

The **ALE Accept Wildcard Call** entry sets whether or not your transceiver accepts and responds to Wildcard calls that it detects.

Wildcard calls are not addressed to a specific station. If your station detects a call with a matching Wildcard address syntax, it sends a response in a random slot to the calling station. Your station enters a link when it receives an acknowledgement from the calling station. If you do not want to receive Wildcard calls, disable this feature.

Default value: Enabled

Related links:

ALE address syntax on page 585
Wildcard call on page 589

ALE AMD Position

NOTE: This entry is available if you have the MIL-STD-188-141B ALE option installed.

The **ALE AMD Position** entry sets the position in which the transceiver transmits AMD information.

For:

- compatibility with other transceivers, select **Leading**
- the shortest possible call duration, select **Auto**

Default value: Auto

With ALE calling, the transceiver may cycle through several channels before a link is established. If you select **Leading**, the AMD information is always positioned in the leading part of the call. The data is transmitted prior to any response from the called station. If the transceiver abandons this channel and moves to the next best channel, it sends the AMD information again prior to any response being received.

NOTE: The leading position is required for interoperability with older Codan HF transceivers, and may be required for interoperability with transceivers from other vendors.

If you select **Auto**, the transceiver determines the best position for the AMD information in the call. It may move the AMD information from the leading part of the call, sending it after a response is received from the other station. **Auto** is the recommended value.

NOTE: When the **Auto** value is selected, the HF networks used to make the call must have the privacy mode set to **Plain**.

Related links:

Privacy mode on page 200

ALE BER

NOTE: This entry is available if you have the FED-STD-1045 ALE or MIL-STD-188-141B ALE option installed.

The **ALE BER** entry increases or decreases the value of the BER threshold used in BER testing.

ALE control information is sent and received in blocks of data called ALE words. Each word is sent three times to reduce the effects of fading, interference and noise. When the words are decoded, the transceiver records the number of errors that occurred in the transmission.

The number of errors indicates the quality of the channel used. A BER of 0 indicates perfect reception. A BER of 48 indicates that all bits of the ALE word were bad.

The **ALE BER** entry enables you to specify the number of errors that will be tolerated in this test, which indicates the quality of the channels on which you are prepared to accept calls.

Range: 0 to 48

Default value: 12

CAUTION: It is recommended that this entry is not altered from the default value.

Related links:

ALE Golay on page 360

ALE Call Scan

NOTE: This entry is available if you have the FED-STD-1045 ALE or MIL-STD-188-141B ALE option installed.

The **ALE Call Scan** entry sets whether or not your transceiver scans channels for incoming calls between a call attempt on each channel.

If you want the transceiver to:

- make outgoing calls without any scanning cycles between call attempts, select **Disabled**
- only scan the channels in the HF network through which the outgoing call is being made, select **Outgoing HF network**
- scan all the channels in the HF networks that are set to be scanned, select **Scanned HF networks**

Default value: Disabled

When this entry is set to **Disabled**, the normal ALE calling sequence is used, that is, the transceiver attempts a call on the first channel in accordance with its settings for LBT and number of retries, then tries the next channel, and so on until the call is successful. The transceiver may miss incoming calls during this outgoing call activity.

When this entry is set to **Outgoing HF networks** or **Scanned HF networks** the transceiver performs a scan cycle, then checks if the channel for the call attempt is unoccupied, and if so, attempts the call. If the call is not successful, the transceiver performs another scan cycle, then either retries the same channel (depending on the value set in the **ALE Retries** entry), or moves to the next channel.

Related links:

ALE Retries on page 363

ALE Scan Cycles

NOTE: This entry is available if you have the FED-STD-1045 ALE or MIL-STD-188-141B ALE option installed.

The **ALE Scan Cycles** entry sets the number of scan cycles that the transceiver performs between call attempts when the **ALE Call Scan** entry is set to **Outgoing HF network** or **Scanned HF networks**.

Range: 1 to 5

Default value: 1

ALE Call Threshold

NOTE: This entry is available if you have the FED-STD-1045 ALE or MIL-STD-188-141B ALE option installed.

The **ALE Call Threshold** entry sets the minimum score for a channel to be tried in ALE calls.

When the quality of a channel is tested it is given an LQA score. This score is based on the results of local and remote measurements for BER and SINAD, and on the call weighting value set in the **ALE Call Weighting** entry.

NOTE: If the **ALE LQA Exchange** entry is set to **Disabled**, remote measurements are not used.

The **ALE Call Threshold** entry enables you to set:

- the minimum score a channel must achieve for it to be tried in ALE calls
- the minimum acceptable standard for the channel at the time when a link is being established

Generally, a score of 15% indicates a channel that an experienced radio operator can use. A score of 25% indicates the minimum acceptable standard for voice communication. A score of 50% indicates a good voice channel. A score of 80% provides a very good voice channel.

The transceiver attempts to make calls on channels for which there is no score, but only after channels with a score above the threshold have been tried. If there are no channels that meet the ALE call threshold, the call is retried on the channels that provided the best response during the first attempt.

Range: 0 to 100

Default value: 25

Related links:

ALE Call Weighting on page 359
ALE LQA Exchange on page 362

ALE Call Weighting

NOTE: This entry is available if you have the FED-STD-1045 ALE or MIL-STD-188-141B ALE option installed.

The **ALE Call Weighting** entry weights the LQA score of ALE channels for data or voice.

When the quality of a channel is tested it is given an LQA score. The **ALE Call Weighting** entry enables you to weight the scoring process according to the use of the transceiver for voice and data communication. For example, if the transceiver is used to make voice calls, you would select **Mostly voice**.

When **Lowest acceptable** is selected, the transceiver attempts a call on the channel with the lowest frequency (with an LQA score above the set threshold), then attempts the channel with the next higher frequency and LQA score etc, until a link is established. In some situations where propagation distances may be less than a few hundred kilometres, weighting the LQA scores in this way increases their effectiveness.

Available values: Data only, Mostly data, Data and voice, Mostly voice, Voice only, Lowest acceptable

Default value: Mostly voice

ALE Golay

NOTE: This entry is available if you have the FED-STD-1045 ALE or MIL-STD-188-141B ALE option installed.

The **ALE Golay** entry sets the value of the Golay threshold used in Golay testing.

ALE control information is sent and received in blocks of data called ALE words. After a word is received, BER tested and accepted, the transceiver performs a Golay test to check it for errors, and correct it if necessary.

The number of error bits per word indicates the quality of the channel used to transmit the word. Golay testing can detect and correct up to three error bits per ALE word. It can also detect four error bits, but is not guaranteed to correct all four. Note that excessive errors can sometimes create false readings.

The **ALE Golay** entry enables you to specify the number of errors that will be tolerated and corrected in this test, which indicates the quality of the channels on which you are prepared to accept calls.

Range: 0 to 4

Default value: 2

CAUTION: It is recommended that this entry is not altered from the default setting.

ALE Hangup ALL Call

NOTE: This entry is available if you have the FED-STD-1045 ALE or MIL-STD-188-141B ALE option installed.

NOTE: You must switch the transceiver off then on again to activate the new value.

The **ALE Hangup ALL Call** entry sets whether or not the initiator of an ALL call can hang up the call to all linked stations.

During an ALL call, a link is established implicitly without the called stations responding to the calling station. When the **ALE Hangup ALL Call** entry is set to **Enabled**, the calling station sends a link termination sequence when **SCAN** is pressed. All stations that entered the link hang up the link and return to scanning when they receive this sequence.

Default value: Enabled

ALE Hangup Phone Call

NOTE: This entry is available if you have the FED-STD-1045 ALE or MIL-STD-188-141B ALE option installed.

NOTE: You must switch the transceiver off then on again to activate the new value.

The **ALE Hangup Phone Call** entry sets whether or not a member of an ALE link to an automated radio/telephone interconnect unit sends a link termination sequence when **SCAN** is pressed.

During any ALE Phone call, a link is established between the calling station and the telephone station that has an automated radio/telephone interconnect unit, for example, a Codan 3033 Telephone Interconnect. When the **ALE Hangup Phone Call** entry is set to **Enabled**, all stations receive a link termination sequence when **SCAN** is pressed at one of the stations. All stations that entered the link hang up the link and return to scanning when they receive this sequence. This value may be required in ALE/CALM HF networks with an automatic interconnect unit.

If the **ALE Hangup Phone Call** entry is set to **Disabled**, a link termination sequence is not sent when **SCAN** is pressed at any of the stations in the link. In this case, a hangup sequence must be sent separately to the radio/telephone interconnect unit to clear the telephone line, or the radio/telephone interconnect unit hangs up after a timeout period.

Default value: Enabled

ALE Hangup Voice Call

NOTE: This entry is available if you have the FED-STD-1045 ALE or MIL-STD-188-141B ALE option installed.

NOTE: You must switch the transceiver off then on again to activate the new value.

The **ALE Hangup Voice Call** entry sets whether or not a member of an ALE link sends a link termination sequence when **SCAN** is pressed.

During any ALE call, a link is established between the calling and called stations. When the **ALE Hangup Voice Call** entry is set to **Enabled**, all stations receive a link termination sequence when **SCAN** is pressed at one of the stations. All stations that entered the link hang up the link and return to scanning when they receive this sequence.

If the **ALE Hangup Voice Call** entry is set to **Disabled**, a link termination sequence is not sent when **SCAN** is pressed at any of the stations in the link. In this case, only this station ends its link.

Default value: Enabled

ALE LQA Exchange

NOTE: This entry is available if you have the FED-STD-1045 ALE or MIL-STD-188-141B ALE option installed.

The **ALE LQA Exchange** entry sets whether or not LQA information is exchanged between stations during each call so that the link quality can be assessed in both directions.

If you want the transceiver to:

- receive any LQA information sent from the other station, but not request this information, select **Disabled**
- send and receive LQA information to and from other stations during calls, select **Enabled**

Default value: Enabled

NOTE: When the **ALE LQA Exchange** entry is set to **Enabled**, it increases the length of time it takes to establish a call by approximately 4 seconds for every 10 channels on which the call is tried.

NOTE: LQA information is always exchanged during a Channel Test call in an ALE/CALM HF network (MIL-STD-188-141B ALE option), regardless of the setting in the **ALE LQA Exchange** entry.

NOTE: Exchange of LQA information may affect interoperability with non-Codan HF transceivers. If interoperability is affected, set the **ALE LQA Exchange** entry to **Disabled**.

ALE LQA Mapping

NOTE: This entry is available if you have the FED-STD-1045 ALE or MIL-STD-188-141B ALE option installed.

The **ALE LQA Mapping** entry determines the method by which the LQA information is stored within the transceiver, that is, according to frequency or channel number.

Available values: Frequency, Number

Default value: Frequency

ALE Retries

NOTE: This entry is available if you have the FED-STD-1045 ALE or MIL-STD-188-141B ALE option installed.

The **ALE Retries** entry sets the number of times the transceiver retries a channel when attempting to establish an ALE link before trying the next best channel in the HF network.

If you do not want the transceiver to retry channels, set the **ALE Retries** entry to zero.

Range: 0 to 5

Default value: 0

ALE Selective Message

NOTE: This entry is available if you have the MIL-STD-188-141B ALE option installed.

The **ALE Selective Message** entry sets whether or not you can send a message with a Selective call made in an ALE/CALM HF network.

If the **ALE Selective Message** entry is set to **Enabled**, you are prompted to include a message with a Selective call in an ALE/CALM HF network.

Default value: Disabled

ALE Silent Mode

NOTE: This entry is available if you have the FED-STD-1045 ALE or MIL-STD-188-141B ALE option installed.

The **ALE Silent Mode** entry prevents automatic ALE transmissions from the transceiver.

If you want the transceiver to:

- operate as a normal ALE station, select **Disabled**
- be able to make ALE calls but not receive them, and receive sounding signals but not transmit them, select **Enabled**

Default value: Disabled

ALE Soundings

NOTE: This entry is available if you have the MIL-STD-188-141B ALE option installed.

The **ALE Soundings** entry sets the conclusion that the transceiver sends with a sounding.

If you want the transceiver to:

- switch off all sounding activity regardless of the **Sounding Interval** entry, select **Disabled**
- send a TWAS conclusion to the sounding, that is, not remain in a state that accepts a link, select **Default**
- send a TIS conclusion to the sounding, that is, pause at the end of the sounding ready to accept a link, select **Invite link**

Default value: Default

Related links:

Sounding interval on page 200

Settings > GPS

The GPS settings enable you to set up how the transceiver handles GPS information.

Related links:

GPS Detection Timeout on page 365
GPS Show Options on page 365
GPS Format Options on page 366
My Position on page 366
GPS Plotter Contexts on page 368
Output Local GPS on page 369

GPS Detection Timeout

The **GPS Detection Timeout** entry sets the time the transceiver waits to receive updated GPS information before it shows an error message. The **GPS Detection Timeout** entry is only active when the GPS Call option is installed.

NOTE: You cannot make Send Position calls until the transceiver receives valid GPS information. If you send an Emergency call before valid GPS information is received, the last known position is sent with the call. If you receive a Get Position call, the last known position is returned to the caller.

When valid GPS data is received, a message is shown on the screen to inform you of this.

If your transceiver is using static GPS information in the **My Position** entry, set the **GPS Detection Timeout** entry to **Disabled**.

Available values: Disabled, range specified below

Range: 5 to 30 min

Default value: 10 min

GPS Show Options

The **GPS Show Options** entry sets whether or not altitude and speed information is shown on the GPS screen and user-status area. By default, altitude and speed data are hidden.

Available values: Show altitude, Show speed

Default value: no selection

GPS Format Options

The **GPS Format Options** entry sets how GPS information is formatted on the GPS screen, entry fields for GPS information, call pop-ups, and in the user-status areas.

Table 14: GPS formats

Format	Latitude/Northing	Longitude/Easting
Degrees and Minutes (MinDec)	34° 52.847’ S	E 138° 41.257’ E
Decimal Degrees (DegDec)	34.88078° S	138.68762° E
Degrees, Minutes, Seconds (DMS)	34°52’50.8” S	138°41’15.4” E
Universal Transverse Mercator (UTM)	Zone: 54 South 6137738 m	288645 m

If you want to show GPS information as:

- degrees and decimal minutes, select **Degrees and Minutes (MinDec)**
- decimal degrees, select **Decimal Degrees (DegDec)**
- degrees, minutes and seconds, select **Degrees, Minutes, Seconds (DMS)**
- a UTM grid reference, select **Universal Transverse Mercator (UTM)**

Default value: Degrees and Minutes (MinDec)

NOTE: When GPS information is sent via a Selcall HF network, the altitude is shown as --.

My Position

The **My Position** entry enables you to enter static GPS information for a fixed station, which typically does not have a GPS receiver attached. The transceiver uses this reference information to perform automatic distance and bearing calculations to a waypoint.

NOTE: If you are entering GPS information into this field in TPS, you can clear the field by clicking on the **Clear** button

NOTE: Automatic distance and bearing calculations only occur when the GPS Call option is installed.

NOTE: If you are using the **My Position** entry as your source of GPS information, you should set the **GPS Detection Timeout** entry to **Disabled**.

NOTE: The format of the GPS information is set in **Settings** > **GPS** > **GPS Format Options**.

CAUTION: If a GPS receiver is connected as a peripheral device, the live GPS information overrides the GPS information stored in the **My Position** entry.

NOTE: If you are entering text into a field in the control point, you may use characters from any of the supported languages.

Default value: no selection

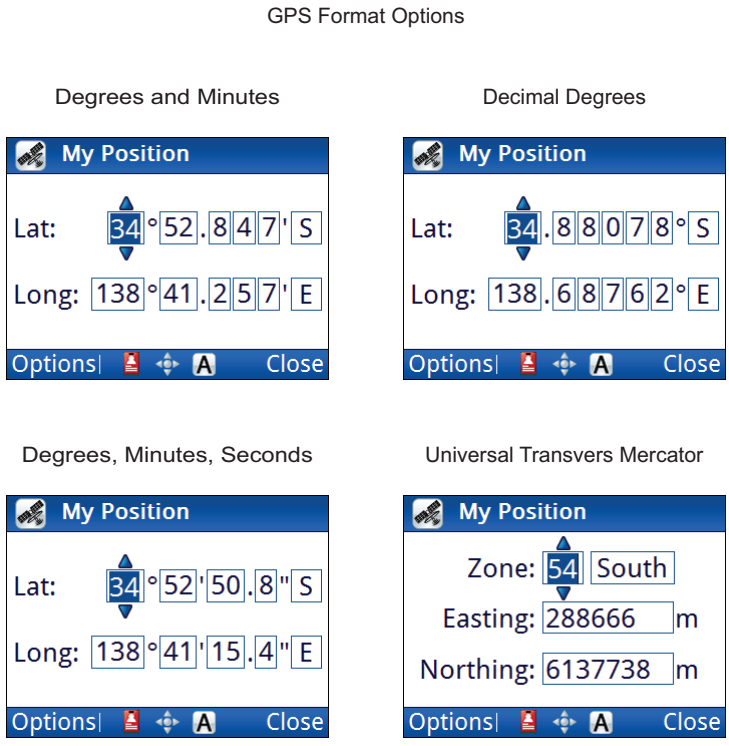
Related links:

GPS Format Options on page 366
GPS Detection Timeout on page 365

Entering GPS information

GPS information may be entered into the **My Position** entry in a number of formats. The format that is shown in the entry fields is dependent on the value set in **Settings** > **GPS** > **GPS Format Options**.

Figure 75: Possible GPS entry screens for My Position



To enter GPS information:

- Do *one* of the following:
  - Press ▲ or ▼ to scroll to the value that you want to set.
  - Type the value in the field using the keypad.
- Press ◀ or ▶ to select the next field in which you want to enter a value.
- Enter the value.
- Press (**Options**), scroll to **Save**, then press (**Select**).
- Press (**Save**) to save the information.

Related links:

GPS Format Options on page 366

Clearing GPS information

To clear the GPS information stored in the **My Position** entry:

- Press (**Options**), scroll to **Clear**, then press (**Select**).

NOTE: The **Clear** option is available only when **My Position** entry is not empty

GPS Plotter Contexts

The **GPS Plotter Contexts** entry sets which position information sources are sent to an external GPS plotter device. Position information may be stored in the Envoy transceiver in:

- call logs and call pop-ups for Get Position, Send Position, and Emergency calls
- the **My Position** entry in **Settings** > **GPS**
- waypoints
- distance and bearing

If you want an external GPS plotter device to receive position information that is derived from:

- relevant call types that have been received but not acknowledged, select **Call pop-ups**
- all relevant call types that have been received, select **Incoming calls**
- all relevant call types that have been sent, select **Outgoing calls**
- an attached GPS receiver or **My Position** entry, select **Local position**
- all waypoints, select **Waypoints**
- the currently selected waypoint on the **Distance and bearing** tab, select **Distance and bearing**

Default value: all available position information sources selected

Output Local GPS

The **Output Local GPS** entry sets whether or not the current position information for your transceiver is sent to an external GPS plotter device.

Default value: Enabled

Settings > Audio

The audio settings enable you to set up how the transceiver handles sidetone volumes. Some audio settings are set automatically according to the requirements of the peripheral device connected.

Related links:

Ring Sidetone Volume on page 370
Call Sidetone Volume on page 370
Peripherals on page 233

Ring Sidetone Volume

The **Ring Sidetone Volume** entry sets the volume of the ring tones heard at the local speaker, relative to the volume setting for the speaker, as adjusted by the and keys.

Range: –16 to 16

Default value: 0

Call Sidetone Volume

The **Call Sidetone Volume** entry sets the volume of the calling tones heard at the local speaker, relative to the volume setting for the speaker, as adjusted by the and keys.

Range: –16 to 16

Default value: –4

Settings > Security

The security settings enable you to set up how the encryptor modules in the transceiver behave, and how you may select, edit or delete secure keys.

Related links:

CES-128 Mode on page 371
Privacy Code on page 372
Standby After Selcall on page 372
Secure User Access on page 372
General Options on page 373
Secure Start State on page 373
CES Options on page 374
CES Key Prefix on page 374
Digital Key Prefix on page 374
Digital Voice Options on page 375
Digital Mute Start State on page 375
Vocoder Type on page 376
Grant Tone on page 376
Secure After ALE Call on page 376

CES-128 Mode

NOTE: This entry is available if you have the CES-128 Encryptor option installed.

The **CES-128 Mode** entry sets the default secure mode of the CES-128 voice encryptor. This mode is used each time you press SEC to go secure using the Global key, or the selected Corp-xx key.

NOTE: You can change the secure mode during a secure session. This does not change the value that you set for the **CES-128 Mode** entry.

If you want to:

- use a secure key for encryption that is common to all Codan CES-128 voice encryptors, select **Global**
- use a secure key for encryption that has been created for use in your organisation, select **Corporate**

Default value: Global

Related links:

Creating a macro to toggle a setting on page 279

Privacy Code

NOTE: This entry is available if you have the CIVS Voice Scrambler option installed.

The **Privacy Code** entry sets the level at which the CIVS scrambler operates when you press SEC.

NOTE: You may change the level during a secure session, if permitted, by *holding* SEC.

Range: 1 to 32

Default value: 21

Related links:

Changing the privacy code on page 446

Standby After Selcall

The **Standby After Selcall** entry sets the length of clear audio time after a secure call is made using a Codan Selcall HF network.

If your HF communication network operates with a Codan Selcall HF network, you will not hear revertives from the called station when secure mode is active. You can set a brief period following a secure call made in a Codan Selcall HF network during which the transceiver enters secure standby, listens for revertives, then returns to secure mode after any one of the following:

- the end of the period is reached
- you press PTT to begin transmission
- you receive encrypted audio from another station

The time required depends on the length of time the called station takes to tune the antenna, typically 12 to 15 seconds.

Range: 0 to 30 sec

Default value: 12 sec

Secure User Access

The **Secure User Access** entry sets the actions that can be performed at user level. You may select multiple actions.

If you want the user to be able to:

- change the secure index that is used for encryption or the privacy code that is used for voice scrambling, select **Select key**
- edit the key in a secure index, select **Edit key**
- erase the key in a secure index, select **Erase key**
- edit the first key only in the list, select **Edit first key**

Default value: Select key

General Options

The **General Options** entry sets options for all encryptors.

If you want to:

- enable the user to select the encryptor type via *hold* SEC (2220/2230), or the **Secure Info** function (2221), select **Allow user to select encryptor type**
- enable the user to erase CES secure keys and AES secure keys using the ⏻ + SEC hot-key sequence (2220/2230) or **Functions** > **Power Plus Macros** > **Secure Erase** (2221), select **Hot-key sequence to erase keys**
- prevent the user from exiting secure mode, select **Always secure**

Default value: Allow user to select encryptor type

Secure Start State

The **Secure Start State** entry sets the secure state of the transceiver at power up.

If you want the transceiver to:

- return to the secure state it was in prior to the transceiver being switched off then on again, select **Leave as is**
- go secure at power up, select **Secure on**
- remain clear at power up, select **Secure off**

Default value: Leave as is

CES Options

NOTE: This entry is available if you have the CES-128 Encryptor option installed.

The **CES Options** entry sets the operational settings for the CES voice encryptor. You may select multiple actions.

If you want to:

- enable the use of a PIN for private communication within an organisation, select **Session PIN entry**
- hear all communications in clear mode, but switch to secure mode when an encrypted transmission is detected from another station that is in secure mode, or you press PTT, select **Secure standby**
- enable secure standby mode and allow transmissions in clear, select **Clear Tx during standby**

NOTE: If you select **Clear Tx during standby**, you must also select **Secure standby**.

Default value: no selection

CES Key Prefix

NOTE: This entry is available if you have the CES-128 Encryptor option installed.

The **CES Key Prefix** entry is used to set a common prefix for all CES secure keys. You may enter up to 4 alphanumeric characters.

Default value: Corp

Digital Key Prefix

The **Digital Key Prefix** entry is used to set a common prefix for secure keys used by digital encryptors. You may enter up to 4 alphanumeric characters.

Default value: TEK

Digital Voice Options

The **Digital Voice Options** entry sets whether or not the digital voice rate (data rate) and digital voice mute options are locked at user level. You can also suppress any temporary channel noise burst on a connected or built-in loudspeaker during an operational event (for example, changing a channel or mode) unless digital voice is present.

The digital voice rate sets the speed with which digital voice transmissions are sent. The digital voice rate is shown in status area 1 of the screen. Use the lowest digital voice rate in the first instance, then if good HF propagation conditions exist, a higher rate may be selected. Before choosing to lock the digital voice rate, you must select the rate that you want to use. A higher digital voice rate provides a better quality of transmitted voice.

NOTE: The digital voice rate may be changed by *holding* SEC, then selecting the rate that you want to use. Alternatively, you may assign the **Next Digital Voice Rate** macro to a hot key.

When digital voice is active, you have the option of selecting voice mute (**V**), selcall mute (**S**), or digital voice mute (**D**). Digital voice mute enables digital voice to be processed through to the user when scanning is off or paused. Voice mute enables all analogue and digital voice detected at your station to be processed, and selcall mute enables analogue and digital voice that is directed to your station to be processed. You can lock the digital voice mute so that it is always on at user level.

To suppress any analogue noise burst on the loudspeaker during an operational event (for example, changing a channel, volume or a mode) when digital voice mute (**D**) is turned on, you need to choose the **Muted unless digital voice** option.

Available values: Lock data rate, Lock digital voice mute, Muted unless digital voice

Default value: no selection

Digital Mute Start State

The **Digital Mute Start State** entry sets the digital mute state of the transceiver at power up.

If you want the transceiver to:

- return to the mute state it was in prior to the transceiver being switched off then on again, select **Leave as is**
- use digital mute at power up, select **Mute on**
- remain unmuted at power up, select **Mute off**

Default value: Leave as is

Vocoder Type

The **Vocoder Type** entry sets the vocoder type used by the DV option during transmission.

NOTE: You must switch encryption off then on again for this value to be activated.

NOTE: Receiving DV stations, which have both MELPe and TWELP vocoders available by default, automatically switch to the appropriate rate and vocoder type when a signal is detected.

Available values: MELPe, TWELP

Default value: TWELP

Grant Tone

The **Grant Tone** entry sets whether or not the Grant tone is played when PTT is pressed for digital voice transmission. The Grant tone can be enabled for the latest second generation Codan Digital Voice technology to help P25 users with the transition to fully digital HF systems. If the tone is enabled, the caller is advised by a grant tone "beep" to start talking.

Default value: Disabled

Secure After ALE Call

The **Secure After ALE Call** entry sets the secure state of the transceiver when an ALE Selective, Emergency or Phone call ends.

If you want to ensure:

- secure is turned on at the end of these types of calls, set the value to **Secure on**.
- secure is turned off, set the value to **Secure off**.
- secure state of the transceiver isn't changed at the end of these types of calls, set the value to **Leave as is**

This setting applies for both control point and CICS calls.

NOTE: Both secure voice and data are transitioned, if both capabilities are available.

Default value: Leave as is

Settings > Connectivity

The connectivity settings enable you to modify the network connectivity settings for non-standard or complex Envoy transceiver installations.

NOTE: If you are entering text into a field in the control point, you may use characters from any of the supported languages.

Related links:

Control Point IP Address on page 377
Control Point Alias on page 378
Network Mask on page 378
DHCP Client on page 378
Default Gateway on page 379
USB IP Address on page 379
USB Network Mask on page 379
USB DHCP Server on page 379
RFU IP Address on page 380
RFU Alias on page 382
RFU Network Mask on page 382
RFU DHCP Client on page 382
RFU Default Gateway on page 383

Control Point IP Address

The **Control Point IP Address** entry sets the IPv4 address for the control point. If you have multiple control points for an RFU, you must set a different IP address for each control point, or enable the DHCP clients in the control point and RFU. Typically, the RFU remains on a static IP address.

CAUTION: *Do not* enable the DHCP client in a control point unless a DHCP server is active in your network or Envoy SmartLink.

If you have set the **DHCP Client** entry to **Enabled**, this entry is ignored and greyed out.

Default value: 192.168.0.249 (handset), 192.168.0.247 (desk console)

Related links:

DHCP Client on page 378
RFU DHCP Client on page 382

Control Point Alias

The **Control Point Alias** entry sets the network alias for this control point. If you have multiple control points connected to an RFU, you can identify each control point with a meaningful name.

Default value: CP

Related links:

Changing the alias of a control point on page 497

Network Mask

The **Network Mask** entry sets the network mask for the control point.

If you have set the **DHCP Client** entry to **Enabled**, this entry is ignored and greyed out.

Default value: 255.255.255.0

Related links:

DHCP Client on page 378

DHCP Client

The **DHCP Client** entry sets whether or not there is a DHCP client active on this control point. Typically, the DHCP client is enabled if the control point is connected to a computer network that has a DHCP server enabled.

CAUTION: *Do not* enable the DHCP client in a control point unless a DHCP server is active in your network or Envoy SmartLink.

NOTE: When the control point is starting up, if **DHCP Client** is set to **Enabled** and the control point is still acquiring an IP address, it will display "Waiting for IP address..." pop-up. This usually occurs if the DHCP server (or Envoy SmartLink) is slow to respond, unavailable or still booting up.

If you have set the **DHCP Client** entry to **Enabled**, it overrides any IP address, network mask or gateway value that may have been entered manually.

Default value: Disabled

Default Gateway

The **Default Gateway** entry sets the IPv4 address of the default gateway for the control point.

If you have set the **DHCP Client** entry to **Enabled**, this entry is ignored and greyed out.

Default value: 192.168.0.1

USB IP Address

The **USB IP Address** entry sets the IPv4 address for the USB interface on the control point. The USB interface on the control point can also act as a DHCP server.

CAUTION: It is recommended that this setting is not changed.

Default value: 192.168.234.1

USB Network Mask

The **USB Network Mask** entry sets the network mask for the USB interface on the control point.

CAUTION: It is recommended that this setting is not changed.

Default value: 255.255.255.0

USB DHCP Server

The **USB DHCP Server** entry sets whether or not there is a DHCP server active on the USB interface for this control point. The server provides IP addresses to any IP-based USB devices that have a DHCP client enabled.

CAUTION: It is recommended that this setting is not changed.

Default value: Enabled

RFU IP Address

The **RFU IP Address** entry sets the IPv4 address for the RFU. If you have multiple RFUs on a computer network, you must set a different IP address for each RFU, or enable the DHCP client in the RFU.

CAUTION: *Do not* enable the DHCP client in an RFU unless a DHCP server is active in your network or Envoy SmartLink.

If you have set the **RFU DHCP Client** entry is set to **Enabled**, this entry is ignored and greyed out.

NOTE: You must switch the transceiver off then on again for this value to be activated.

CAUTION: If you are using VCOM to communicate over a USB or Ethernet connection to the RFU in a system that has a DHCP server enabled, you must use a static IP address for the RFU. Ensure that the **RFU DHCP Client** entry is set to **Disabled**.

Default value: 192.168.0.248

Related links:

RFU DHCP Client on page 382
Resetting the RFU network settings to the factory-default settings on page 380

Resetting the RFU network settings to the factory-default settings

If your control point cannot find an RFU, and you have checked power supplies and cabling, it may be that you have inadvertently set the **RFU DHCP Client** to **Enabled** when a DHCP server is not available in the IP network. You have to reset the RFU network settings to the factory-default settings.

The factory-default RFU network settings are:

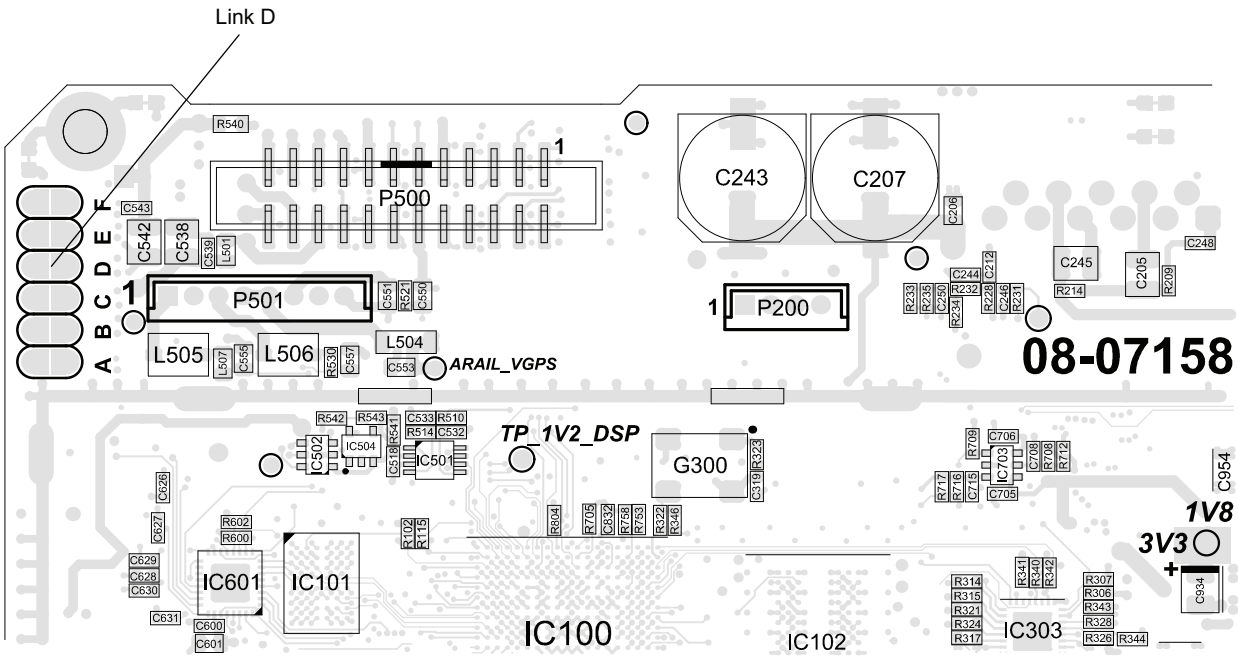
- RFU IP address: 192.168.0.248
- RFU network mask: 255.255.255.0
- RFU DHCP Client: Disabled

To reset the RFU network settings to the factory-default settings:

- ❑ Remove the top cover of the RFU.
- ❑ Locate the printed circuit board with the number 08-07158.

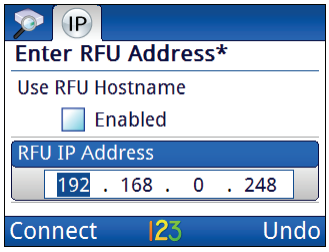
  This is the Control and Audio PCB.
- ❑ Place a piece of wire or the tips of metal tweezers across link D.

Figure 76: Location of link D



- Switch the power to the transceiver off then on again.

  If the IP address of the control point is set within the range 192.168.0.1 to 192.168.0.254, it should connect automatically to the RFU. If the IP address is set outside of this range, the Find RFU screen is shown.



- Enter the default RFU IP address of 192.168.0.248, if required.
- Press (**Connect**).
- Remove the wire or tweezers from across link D.
- Position the top cover onto the chassis, ensuring that the gasket is in place, then screw into position.

CAUTION: If you want the RFU to accept an IP address from a DHCP server in the network, ensure that this server is enabled *before* setting the **RFU DHCP Client** entry to **Enabled**.

RFU Alias

The **RFU Alias** entry sets the network alias for the RFU. If you have multiple RFUs connected to a computer network, you can identify each RFU with a meaningful name.

Default value: RFU

RFU Network Mask

The **RFU Network Mask** entry sets the network mask for the RFU.

If you have set the **RFU DHCP Client** entry to **Enabled**, this entry is ignored and greyed out.

NOTE: You must switch the transceiver off then on again for this value to be activated.

Default value: 255.255.255.0

RFU DHCP Client

The **RFU DHCP Client** entry sets whether or not there is a DHCP client active on the RFU. Typically, the DHCP client is enabled if the RFU is connected to a computer network that has a DHCP server enabled.

CAUTION: *Do not* enable the DHCP client in an RFU unless a DHCP server is active on your computer or Envoy SmartLink.

If you have set the **RFU DHCP Client** entry to **Enabled**, it overrides any IP address, network mask or gateway value that may have been entered manually. If you set the **RFU DHCP Client** entry to **Disabled** after being **Enabled**, it reverts to the previously used IP address, network mask and default gateway values.

CAUTION: If you are using VCOM to communicate over a USB or Ethernet connection to the RFU in a system that has a DHCP server enabled, you must use a static IP address for the RFU. Set the **RFU DHCP Client** entry to **Disabled**.

Default value: Disabled

Related links:

Resetting the RFU network settings to the factory-default settings on page 380

RFU Default Gateway

The **RFU Default Gateway** entry sets the IPv4 address of the default gateway for the RFU. If you have set the **RFU DHCP Client** entry to **Enabled**, this entry is ignored and greyed out.

NOTE: You must switch the transceiver off then on again for this value to be activated.

Default value: 192.168.0.1

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18 Access rights

This section contains the following topics:

Overview of access rights

Access to information in the transceiver can be restricted in two ways: locked and/or hidden. Using TPS System Programmer, you can lock entries to prevent them from being edited, and you can hide them to prevent them from being shown, and therefore edited, at user level. You may also lock and/or hide individual entries, or you can lock and/or hide each top-level menu (Channels, Scan Tables, etc). This access information is saved in the profile, and the profile is programmed to the transceiver.

NOTE: You cannot change these access rights from the control point of the transceiver.

The access rights that are set at admin level affect how an item is viewed and edited at user level. Access rights may also be applied at the factory level. You do not have access to factory level.

Table 15: Access rights

Access right	Description
AL	Items locked at admin level may be viewed at user level, but not edited. These items may be viewed and edited at admin level.
AH	Items hidden at admin level cannot be viewed at user level, and although not locked, cannot be edited. These items may be viewed and edited at admin level.
FL	Items locked at factory level may be viewed at admin and user levels, but not edited.

NOTE: Items that are locked from editing at the current level have a padlock indicator ().

Related links:

Menu structure on page 138
Logging in to admin level on page 146
Overview of basic and advanced views on page 143

19 Digital Voice options

This section contains the following topics:

Overview of digital voice options

Digital voice is now offered through two distinct methods. The latest method offers digital voice with or without MIL/STANAG 2G Data, and with or without an AES-256 Encryption upgrade; these are referred to as the DV options with/without an AES-256 Encryption upgrade. The earlier method offers AES-encrypted digital voice only, and is referred to as the AES-256 DV Encryptor. Stations must have the same digital voice method activated for successful communication.

NOTE: DV options with/without an AES-256 Encryption upgrade are implemented by the RM50 encryptor module. You must have the RM50 module fitted to use these features.

NOTE: The RM50 module can be upgraded from TPS System Programmer or from a USB stick. See *Upgrading the transceiver via a USB stick* on page 125 for more information.

CAUTION: A permit from the Australian government is required if you want to upgrade the RM50 module with an export controlled version firmware package, which enables AES-256 Encryption and Low Rate DV capabilities.

Table 16: Digital voice options

Sales option	Encryptor type	Tab Icon	When the digital voice option is inactive...	When the digital voice option is active...
DV (15-10591)	–		Analogue voice	Digital voice
DV (15-10591) Upgrade, AES-256 Encryption (15-10595)	AES-256		Analogue voice	Secure digital voice
MIL/STANAG 2G Data + DV (15-10590)	–		Analogue voice Clear data	Digital voice Clear data
MIL/STANAG 2G Data + DV (15-10590) Upgrade, AES-256 Encryption (15-10595)	AES-256		Analogue voice Clear data	Secure digital voice Secure data
AES-256 DV Encryptor (15-10565)	AES-256		Analogue voice	Secure digital voice

Related links:

AES-256 encryption for digital voice on page 460

Digital voice rate

The digital voice rate sets the speed with which digital voice transmissions are sent. The digital voice rate is shown in status area 1 of the screen. Use the lowest digital voice rate in the first instance, then if good HF propagation conditions exist, a higher rate may be selected.

NOTE: Receiving DV stations, which have both MELPe and TWELP vocoders available by default, automatically switch to the appropriate rate and vocoder type when a signal is detected.

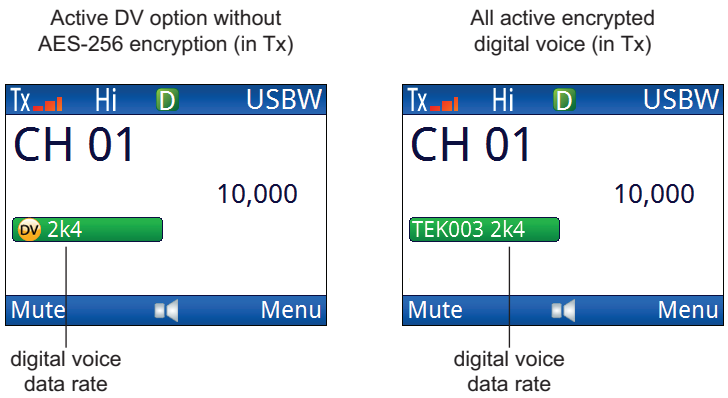
Table 17: Digital voice rates

Digital voice option	Vocoder type	Available voice rates (bit/s)
DV DV with AES-256 Encryption upgrade MIL/STANAG 2G Data + DV MIL/STANAG 2G Data + DV with AES-256 Encryption upgrade	MELPe	1200, 2400
	TWELP	600, 1200, 2400
AES-256 DV Encryptor	–	1200, 2400

NOTE: The 600 bit/s and 1200 bit/s rates are available as sales options for the DV options (with or without encryption). The AES-256 DV Encryptor has standard data rates of 1200 bit/s and 2400 bit/s.

NOTE: 600 bit/s and 1200 bit/s rates are not available if the RM50 module has non-export controlled version firmware.

Figure 77: Channel screen showing the digital voice rate



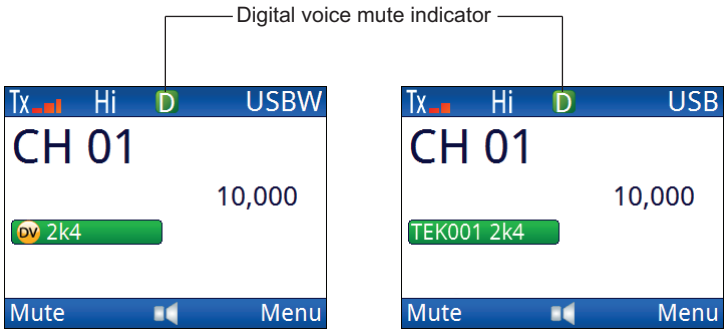
Related links:

Overview of digital voice options on page 388
Selecting the digital voice rate on page 394

Digital voice mute

When any digital voice is active, you have the option of selecting voice mute (**V**), selcall mute (**S**), or digital voice mute (**D**). Digital voice mute enables only secure digital voice or clear digital voice to be processed through to the user when scanning is switched off or paused. Voice mute enables all clear and secure voice detected at your station to be heard by the user, and selcall mute blocks all signals except for calls specifically addressed to your station.

Figure 78: Digital voice mute indicator



DV option without AES-256 Encryption upgrade (in Tx)

All encrypted digital voice (in Tx)

Related links:

Selecting digital voice mute on page 395

Using digital voice

Switching the digital voice feature on or off

To switch the digital voice feature on or off:

- If you are using a 2220 Handset or 2230 Desk Console, press SEC.
- If you are using a 2221 Handset:
  - Press (**Options**).
  - Press ▲ or ▼ to scroll to the **Secure On**|**Secure Off** option.
  - Press (**Select**).

  Digital voice is toggled on or off.

Figure 79: Channel screen showing on/off status for a DV option (without encryption)

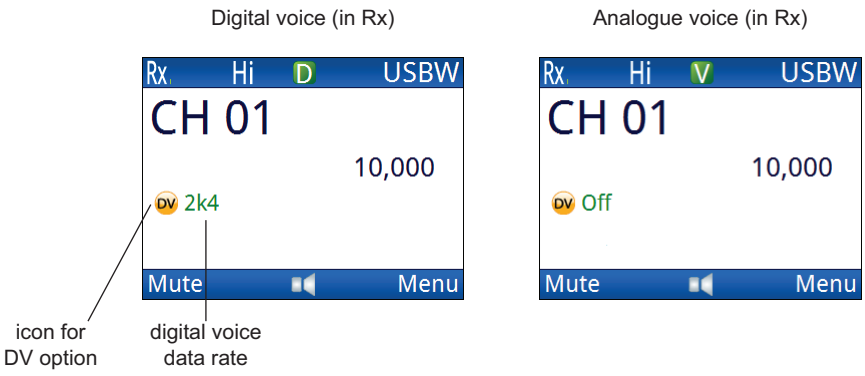
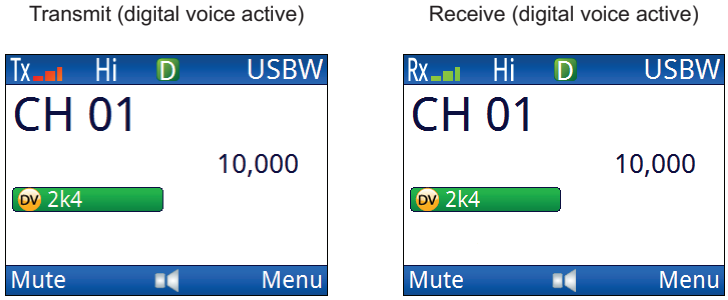


Figure 80: Channel screen showing transmit/receive status for a DV option (without encryption)



CAUTION: If RC50-C is active in a data link and you enable voice mode or press PTT, wait for up to 25 sec before continuing with the digital voice transmission. The receiving station needs this time to regain digital voice synchronisation.

NOTE: When transmitting via a DV option, listen for the Tx ready beep after you have released PTT before you *hold* PTT again.

CAUTION: When transmitting with the AES-256 DV Encryptor, you should *hold* PTT, wait 2 sec, speak, wait 2 sec, then release PTT.

If you have a DV option with the AES-256 Encryption upgrade installed, or you have the AES-256 DV Encryptor installed, the transceiver will also go secure/clear when **SEC** is pressed.

Figure 81: Channel screen showing secure/clear status for all encrypted digital voice

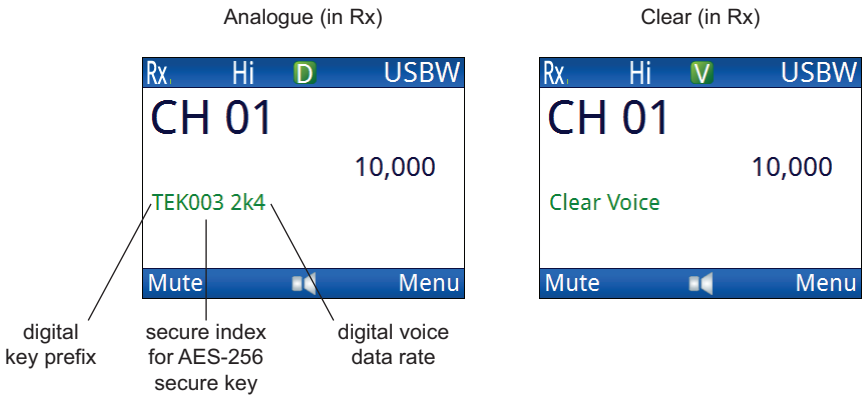
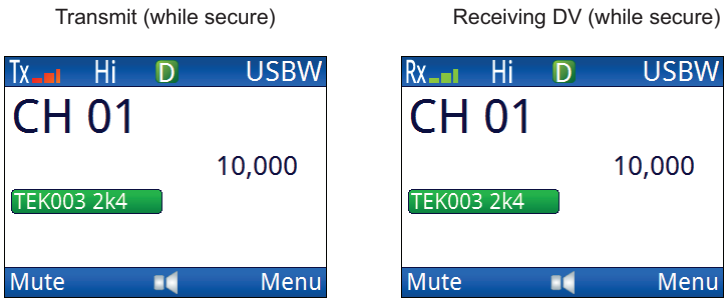


Figure 82: Channel screen showing transmit/receive status for all encrypted digital voice



Selecting the digital voice rate

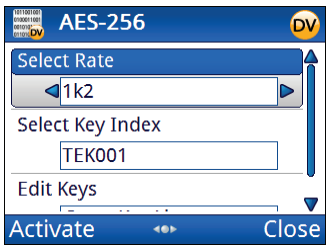
The digital voice rate sets the speed with which digital voice transmissions are sent. The digital voice rate is shown in status area 1 of the screen. Use the lowest digital voice rate in the first instance, then if good HF propagation conditions exist, a higher rate may be selected. The rates from which you can select depend on the vocoder options that you have installed.

NOTE: Receiving DV stations, which have both MELPe and TWELP vocoders available by default, automatically switch to the appropriate rate and vocoder type when a signal is detected.

NOTE: If you change the digital voice rate frequently, you should consider assigning the **Next Digital Voice Rate** macro from **Unassigned** to a hot key.

To select a different digital voice rate:

- If you are using a 2220 Handset or 2230 Desk Console, do *one* of the following:
  - From the main menu,select (**General**), then (**Secure**).
  - *Hold* SEC.
- If you are using a 2221 Handset:
  - From the main menu, select (**Functions**).
  - Press ▲ or ▼ to scroll to the **Secure Info** function.
  - Press (**Select**).



- Press ◀ or ▶ to select the digital voice rate that you want to use.
- Press (**OK**).

Related links:

Digital voice rate on page 389

Selecting digital voice mute

NOTE: Digital voice mute is available when a DV option (with or without the AES-256 Encryption upgrade) or the AES-256 DV Encryptor is active, and scanning is switched off or paused.

NOTE: If you want to suppress any noise burst on a connected or built-in loudspeaker during an operational event (for example, changing a channel or mode) select the **Muted unless digital voice** check box in **Settings** > **Security** > **Digital Voice Options**.

To select digital voice mute:

- Switch off scanning.
- If you are using a 2220 Handset or 2230 Desk Console, press SEC, then press V/S until **D** is shown in the centre of the status bar on the channel screen.
- If you are using a 2221 Handset:
  - Press (**Options**).
  - Press ▲ or ▼ to scroll to the **Secure On** option.
  - Press (**Select**).
  - Press (**Options**).
  - Press ▲ or ▼ to scroll to the **V/S/D** option.
  - Press (**Select**).
  - Repeat these steps until **D** is shown in the centre of the status bar on the channel screen.

DV option without AES-256 Encryption upgrade (in Tx)

All encrypted digital voice (in Tx)

Related links:

Digital voice mute on page 391

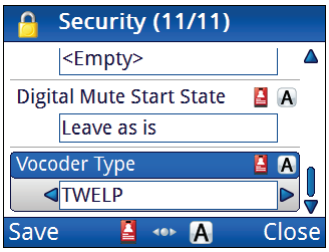
Selecting the vocoder type for transmission

The vocoder is used for transmission of digital voice signals. The vocoder type does not have to be the same across all stations that communicate using a DV option.

NOTE: Receiving DV stations, which have both MELPe and TWELP vocoders available by default, automatically switch to the appropriate rate and vocoder type when a signal is detected.

To select the vocoder type:

- From the main menu,select (**Settings**), then (**Security**).
- Press ▲ or ▼ to scroll to the **Vocoder Type** entry.



- Press ◀ or ▶ to select the vocoder type that you want to use for digital voice communications.
- Press (**Save**) to save the information.
- Press (**Close**).

Related links:

Digital voice rate on page 389

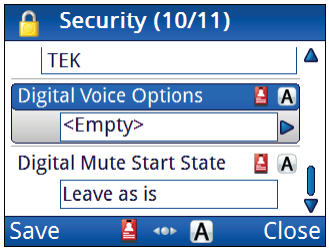
Setting up digital voice

Locking the digital voice rate

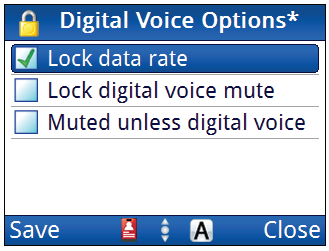
The data rate for digital voice can be locked so that the user cannot change it. You must select the rate that you want to use before locking it.

To lock the digital voice rate:

- Select the digital voice rate that you want to use.
- From the main menu, select (**Settings**), then (**Security**).
- Press ▲ or ▼ to scroll to the **Digital Voice Options** entry.



- Press ▶.
- Ensure that the **Lock data rate** value is highlighted.
- Press (**Select**) to select the check box.



When the check box is selected, the item is enabled. When the check box is clear, the item is disabled.

- Press (**Save**) to save the information.
- Press (**Close**).

Related links:

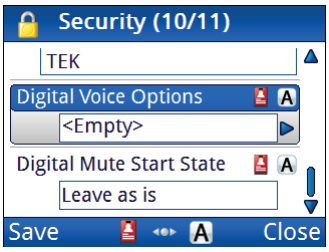
Selecting the digital voice rate on page 394

Suppressing analogue noise bursts with digital voice

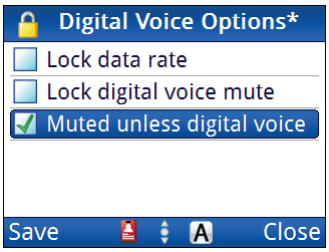
Normal operational events, such as changing a channel or mode, cause mute to switched off temporarily. You can select a digital voice option to suppress this analogue noise burst.

To suppress a noise burst unless digital voice is present:

- From the main menu, select (**Settings**), then (**Security**).
- Press ▲ or ▼ to scroll to the **Digital Voice Options** entry.



- Press ▶.
- Ensure that the **Muted unless digital voice** value is highlighted.
- Press (**Select**) to select the check box.



When the check box is selected, the item is enabled. When the check box is clear, the item is disabled.

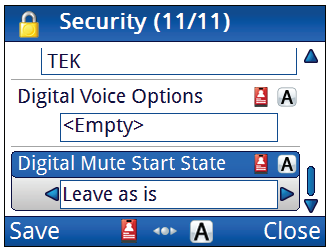
- Press (**Save**) to save the information.
- Press (**Close**).

Setting the start state of digital voice mute

You can set the initial state that digital voice mute uses when you go secure with AES-256 digital voice encryption.

To set the start state of digital voice mute:

- From the main menu,select (**Settings**), then (**Security**).
- Press ▲ or ▼ to scroll to the **Digital Mute Start State** entry.

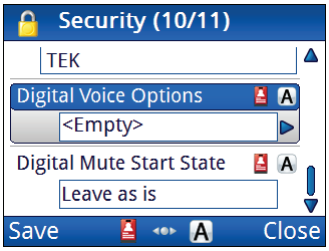


- Press ◀ or ▶ to select the valuethat you want to usefrom the following:
  - If you want digital mute to be on when you enter secure mode, select **Mute on**.
  - If you want digital mute to be off when you enter secure mode, select **Mute off**.
  - If you want digital mute to be in the same state as when secure mode was last used, select **Leave as is**.
- Press (**Save**) to save the information.
- Press (**Close**).

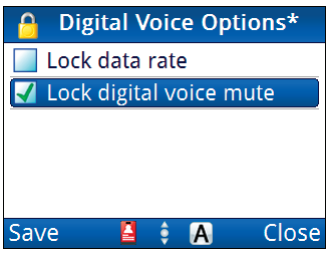
Locking the state of digital voice mute

To lock the state of digital voice mute:

- Select the digital voice mute statethat you want to use.
- From the main menu,select (**Settings**), then (**Security**).
- Press ▲ or ▼ to scroll to the **Digital Voice Options** entry.



- Press ▶.
- Press ▲ or ▼ to scroll to the **Lock digital voice mute** value.
- Press (**Select**) to select the check box.



When the check box is selected, the item is enabled. When the check box is clear, the item is disabled.

- Press (**Save**) to save the information.
- Press (**Close**).

20 Data options

This section contains the following topics:

Overview of data options

A range of data options are available, some providing compatibility with older Codan HF modems, and some providing compatibility with MIL/STANAG waveforms. The MIL/STANAG 2G modem may operate with and without AES data encryption.

When a data application is connected, an icon appears in the status bar of the channel screen.

Related links:

AES-256 data encryption on page 461
The channel screen on page 27
Restrictions on peripheral use on page 256

2.4 kbit/s Data Modem

NOTE: The 2.4 kbit/s Data Modem option must be enabled in your Envoy X2 transceiver.

This internal data modem provides an extremely robust, field-proven HF waveform that is interoperable with Codan's proprietary 3012 protocol and 3212 HF Data Modem (operating in compatibility mode). It is particularly useful for long-range communications in remote areas where existing communications are poor or non-existent. It incorporates data compression to boost effective throughput and is easily integrated with Codan voice and signalling networks.

NOTE: When a data application is connected, an icon appears in the status bar of the channel screen ().

This modem can be used with ALE and Selcall call systems. Voice links may be established first, then a data exchange may be performed.

The modem is controlled by the connected computer using the UUPlus©/Codan Chat© HF data applications. Email is sent and received via your chosen email client, for example Microsoft® Office Outlook®. For information on using UUPlus©/Codan Chat©, please see the documentation provided with the product.

Related links:

Slow Scan - Chirp Data on page 186
The channel screen on page 27
Restrictions on peripheral use on page 256

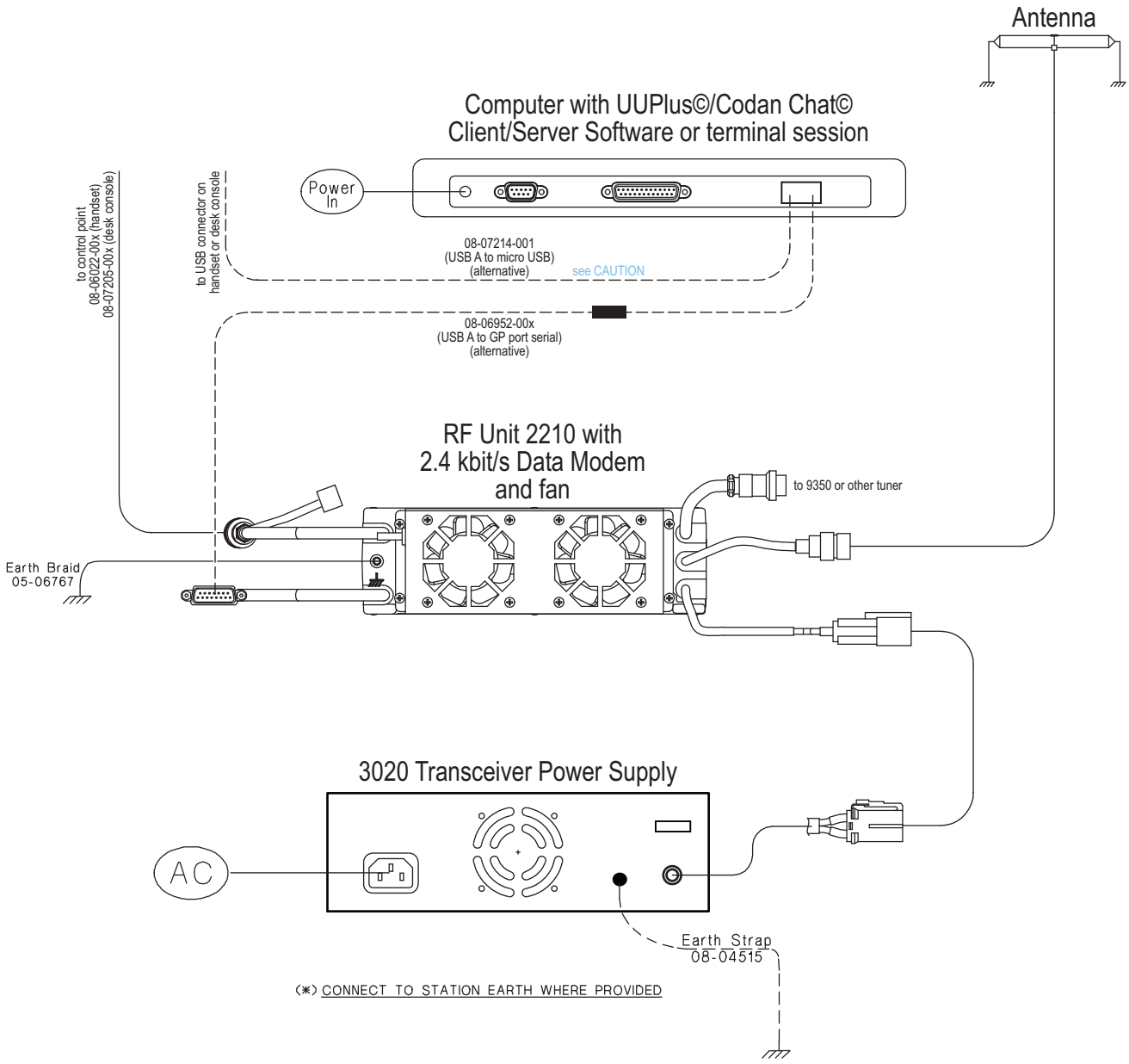
Typical 2.4 kbit/s data station

A typical data station comprises:

- an Envoy X2 transceiver with the 2.4 kbit/s Data Modem option enabled (Codan part number 15-10559)
- a suitable 12 V DC power supply
- an antenna system
- a PC running UUPlus©/Codan Chat© or suitable terminal program
- appropriate connecting cables

NOTE: Software that operates on standard telephone modems should operate over HF via the AT commands.

Figure 83: Envoy X2 transceiver with 2.4 kbit/s Data Modem option and computer



CAUTION: If VCOM is used over a USB–USB connection between the Envoy Transceiver with the internal data modem interface and the computer running the UUPlus/Codan Chat applications, the **2.4 kbit/s Modem Interface** peripheral device must not be selected on the RFU GP port.

CAUTION: The USB–USB connection may be used with 2220/2221 Handsets and 2230 Desk Consoles in stations that are not exposed to excessive local HF interference.

CAUTION: Data transmitted via a VCOM session over a USB–USB connection may be affected by your computer's power-saving activities. Either disable the power-saving mode while data is being transmitted, or verify that the data has been sent correctly when the computer wakes from power-saving mode.

Setting up the serial connection

Installing the driver for the cable

The USB–serial cable requires a specific driver to be installed on the computer. It is available from www.ftdichip.com/Drivers/VCP.htm. Select the latest Windows®-certified driver that is suitable for your computer.

To install the driver for the cable:

- Download a suitable Windows®-certified driver from www.ftdichip.com/Drivers/VCP.htm.
- Double-click on the self-extracting .exe file.

  NOTE: Some older drivers are delivered as a zip file. Extract the files (using folder names) from the zip file. Right-click on the **ftdibus.inf** file, then select **Install**.

Identifying the COM ports used by a USB–serial connection

When you connect the computer to the device via a USB–serial cable, the computer recognises this as two COM ports. You must use the higher of the recognised COM ports when selecting a COM port for the email client.

To identify the numbers of the COM ports used by the USB port:

- On the desktop of the computer, right-click on the **My Computer** icon, select **Properties**—[**Hardware**]—**Device Manager**.
- Connect the USB cable between the device and the computer.
- Wait for two new ports to appear in the Device Manager under **Ports (COM & LPT)**.

  The higher COM port is used by the email client.

Setting the COM port in UUPlus©/Codan Chat©

The COM port used by UUPlus©/Codan Chat© to communicate with the modem must be the same as the COM port used by the computer.

To set up the COM port in UUPlus©/Codan Chat©:

- Launch UUPlus©/Codan Chat© Server/Client.
- Click **Setup**, then select the **Modem Settings** tab.
- Click on the drop arrow in the **Com Port** field, then select the COM port used by the computer.

Selecting the 2.4 kbit/s Data Modem as a peripheral device

The 2.4 kbit/s Data Modem may be connected to a computer via the GP port connector on the RFU, or the GP port connector on the Console, using cable 08-06952-00x. You must select the modem as a peripheral device for the connector.

CAUTION: The 2.4kbit/s Data Modem may only be used via one connector at a time. When using the modem via the Console GP port connector, ensure the RFU GP port connector is not configured to **2.4 kbit/s Data Modem Interface**, as the RFU GP port connector takes precedence for the modem (meaning the modem will not function via the Console GP port).

To select the peripheral device on either the RFU GP port connector or Console GP port connector:

- From the main menu, select (**User Data**), then (**Peripherals**).
- Press ◀ or ▶ to select (**RFU GP Port**), or (**Console GP Port**).
- Press ▲ or ▼ to scroll to the **2.4 kbit/s Data Modem Interface** option, then press **OK**.
- Press (**Save**) to save the information.
- Restart the transceiver (if prompted), to activate the new settings.

Setting up the USB connection

CAUTION: The USB–USB connection may be used with 2220/2221 Handsets and 2230 Desk Consoles in stations that are not exposed to excessive local HF interference.

CAUTION: Ensure that the peripheral device on the RFU GP port is not set to **2.4 kbit/s Data Modem Interface**.

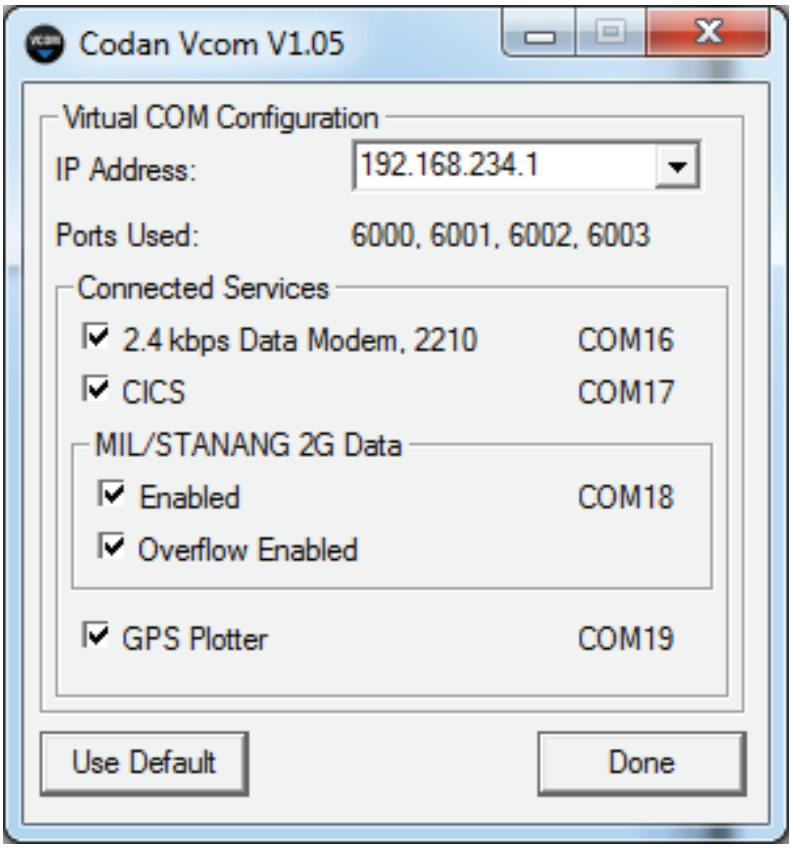
Viewing the COM port setting in VCOM

VCOM provides virtual serial COM ports to enable serial protocols to be used over other protocols, for example, USB and Ethernet. VCOM operates on Windows® 7.

When VCOM launches, it assigns a virtual COM port for use by internal devices in the Envoy transceiver. This port number must be set up in other programs used for data communication over HF and secure key programming.

To view the virtual COM port setting:

- Launch **VCOM Configuration** from **Start** > **All Programs** > **Codan** > **VCOM**.



- Record the value of the COM port used for the device in the **Connected Services** frame.

  This value is entered as the COM port in the relevant application communicating with the Envoy transceiver.

  NOTE: CICS is used for secure key programming via KMS and KFS.

- Click **Done** to close the VCOM Configuration utility.

Pinging the modem from the computer

To ping the modem:

- Connect the computer to the USB connector on the control point and ensure that the transceiver is switched on.
- Start a Command Prompt session on the computer.
- Type **ping** followed by the IP address of the connected control point.

  For example, type **ping 192.168.234.1**

  If the ping is OK, the modem is ready for use.

  If the ping times out:

  - check the cable between the computer and the control point
  - check the IP address of the USB interface on the control point
- Check the communication between the computer and modem at each station in the data network using a terminal session on the COM port used by this modem in VCOM.

Related links:

Using VCOM services on page 135
Viewing the COM port setting in VCOM on page 407
Settings > Connectivity on page 377

Setting the COM port in UUPlus©/Codan Chat©

The COM port used by UUPlus©/Codan Chat© to communicate with the modem must be the same as the COM port set in the Virtual COM PC Application.

To set up the COM port in UUPlus©/Codan Chat©:

- Launch UUPlus©/Codan Chat© Server/Client.
- Click **Setup**, then select the **Modem Settings** tab.
- Click on the drop arrow in the **Com Port** field, then select the COM port used by VCOM.

Related links:

Using VCOM services on page 135
Viewing the COM port setting in VCOM on page 407

Using the 2.4 kbit/s data station

Making a data call

Data calls are made in the background when you send an email via UUPlus©/Codan Chat© (or similar), or when transferring a file between terminal sessions.

NOTE: For information on sending an email via UUPlus©/Codan Chat©, please see the documentation provided with the software.

To make a data call:

- Compose your email in UUPlus©/Codan Chat© (or similar).
- Do *one* of the following:
  - If you want to make the call using a specific channel, switch off scanning on the transceiver's control point, then scroll to the channel that you want to use for the call.
  - If you want to make the call using an ALE/CALM HF network, switch on scanning on the transceiver's control point.

  NOTE: If a channel is common to both HF networks, the type of HF network used for the call is determined by the scanning status when the call is made.
- In UUPlus©/Codan Chat©, press **Send**.

  NOTE: If you are already in an existing Selcall or ALE/CALM link, you will be asked to confirm if you want to override the lock on the system from the existing link.

Viewing the performance of the 2.4 kbit/s Data Modem

You can set one of the status areas to show the link status and throughput of the internal data modem.

To view the performance of the modem:

- Go to the channel screen.
- Use the information in Table 18 to determine the status of the 2.4 kbit/s Data Modem.

Table 18: Status of the 2.4 kbit/s Data Modem

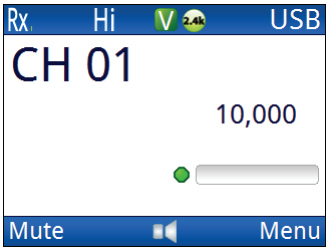
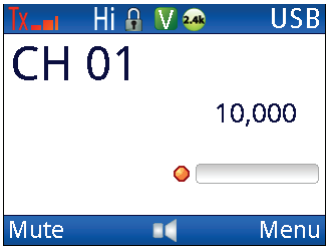
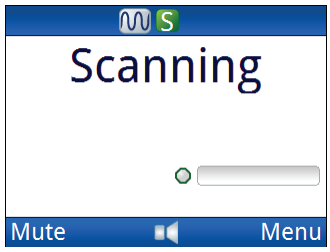
Colour of LED	State	Description
Green	Solid	The transceiver has the modem enabled as a peripheral device on the GP port. The modem is enabled and a computer is communicating with it via VCOM over the USB–USB connection. 
Green	Flashing	The station is establishing a link, or in a link, with another station. This station is the receiver of the link. 
Red	Flashing	The station is establishing a link, or in a link, with another station. This station is the initiator of the link. 

Table 18: Status of the 2.4 kbit/s Data Modem (cont.)

Colour of LED	State	Description
Red (bar)	Variable length	Red bar is indicative of the data throughput rate for the link. 
Grey	Solid	The modem is enabled in the firmware, but a computer is not connected and/or not communicating with it.  Check that VCOM is running as a background task.

CAUTION: Data transmitted via a VCOM session over a USB–USB connection may be affected by your computer's power-saving activities. Either disable the power-saving mode while data is being transmitted, or verify that the data has been sent correctly when the computer wakes from power-saving mode.

Related links:

Selecting information to be shown in a status area on page 31

MIL/STANAG 2G Data

MIL/STANAG 2G Data provides data communications. It may also be used to provide high-grade AES-256 digital encryption. It must be used in conjunction with the RC50-C HF Email software. The data modem is capable of high-speed data transfer at speeds of up to 9600 bit/s using STANAG 4539 waveforms. This modem also supports MIL-STD-188-110A/B (including Appendix F), STANAG 4285, STANAG 4529, and STANAG 4415 waveforms.

NOTE: When a data application is connected, an icon appears in the status bar of the channel screen (2G).

NOTE: MIL/STANAG 2G Data is implemented by the RM50 encryptor module. You must have the RM50 module fitted to use this feature.

NOTE: The RM50 module can be upgraded from TPS System Programmer or from a USB stick. See *Upgrading the transceiver via a USB stick* on page 125 for more information.

CAUTION: A permit from the Australian government is required if you want to upgrade the RM50 module with an export controlled version firmware package, which enables AES-256 Encryption and Low Rate DV capabilities.

Related links:

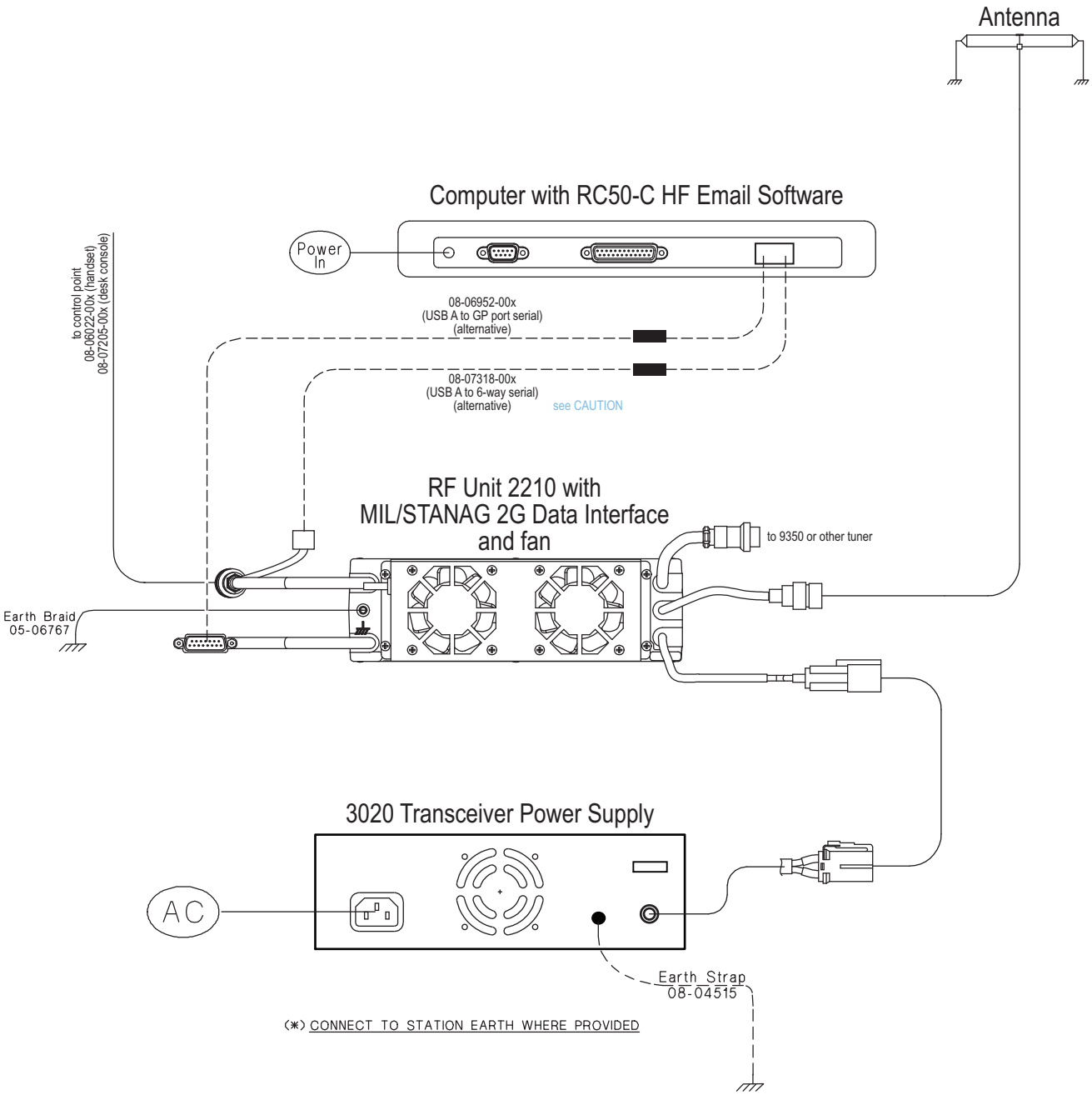
AES-256 data encryption on page 461
The channel screen on page 27
Restrictions on peripheral use on page 256

Typical MIL/STANAG 2G data station

A typical MIL/STANAG 2G data station comprises:

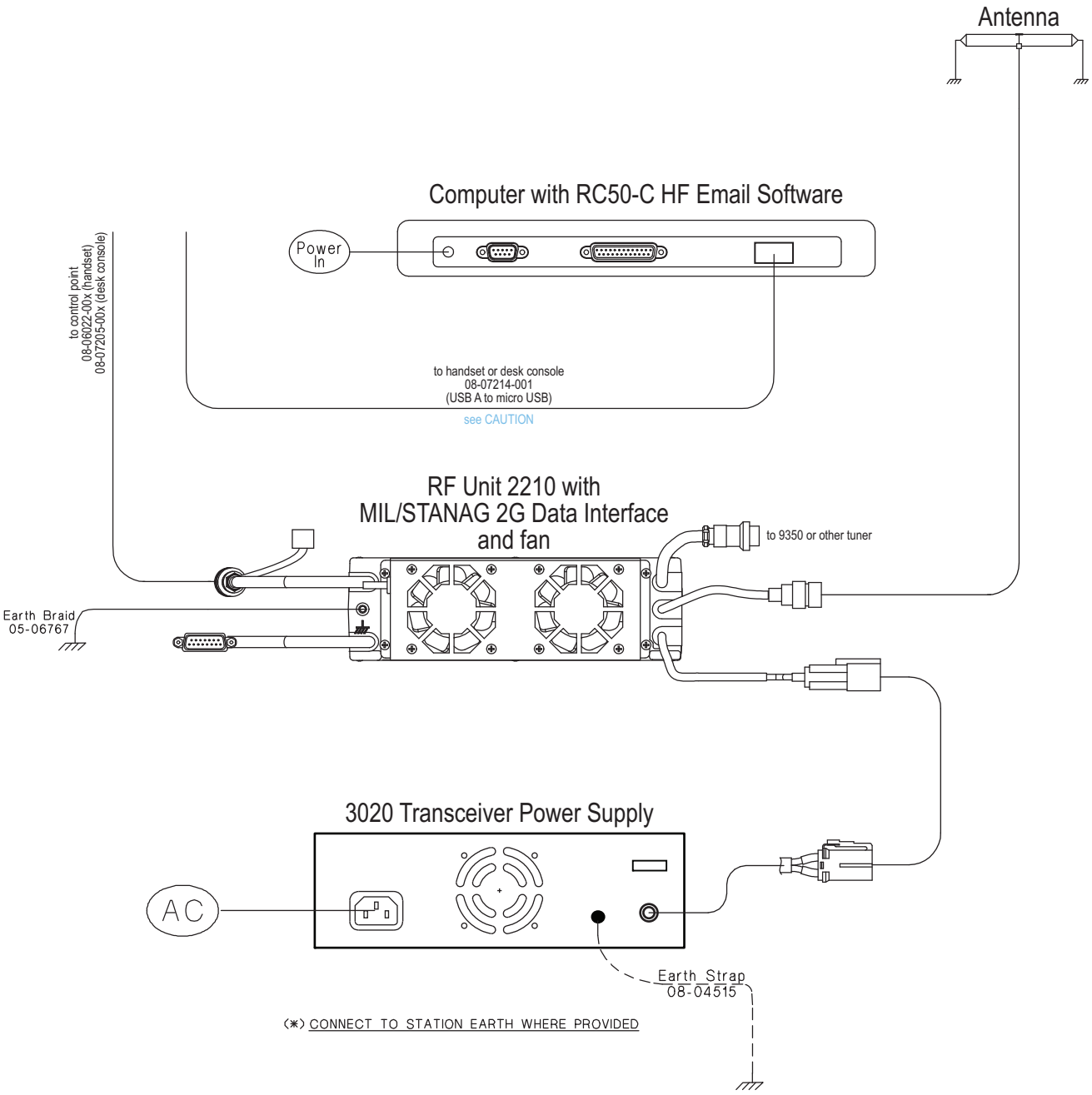
- an Envoy X2 transceiver with MIL/STANAG 2G Data option
- an antenna system
- an appropriate 12 V DC power supply
- a computer with RC50-C HF Email software
- appropriate connecting cables

Figure 84: Envoy X2 transceiver with MIL/STANAG 2G Data via serial cable



CAUTION: If the 6-way port is used with serial cable 08-07318-00x, the **RFU GP Port MIL/STANAG 2G Data** peripheral device must not be selected on the RFU GP port.

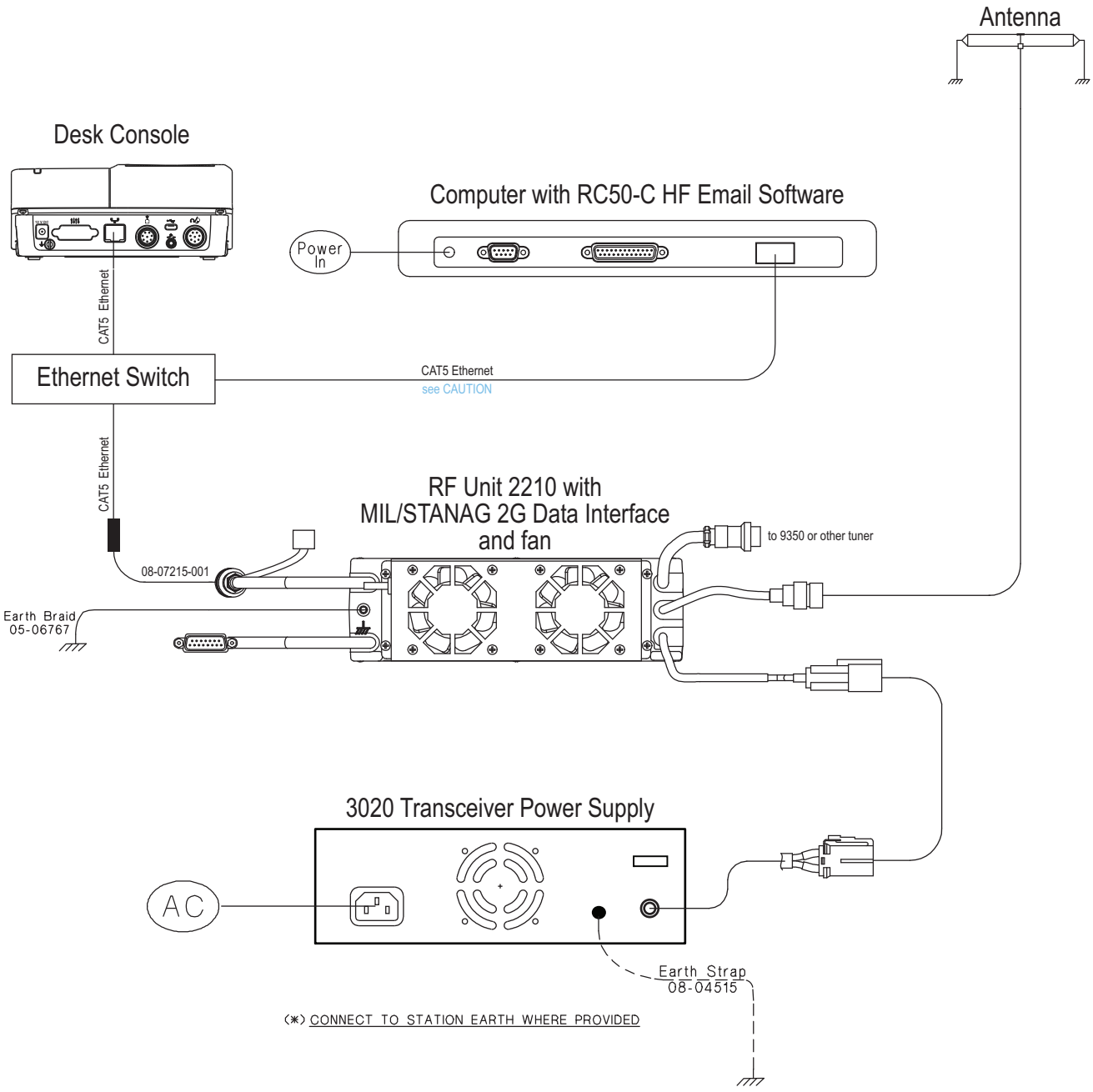
Figure 85: Envoy X2 transceiver with MIL/STANAG 2G Data via VCOM over USB cable



CAUTION: When VCOM is used over the USB cable (08-07214-001), the **RFU 6way MIL/STANAG 2G Data** and **RFU GP Port MIL/STANAG 2G Data** peripheral devices must not be selected on the respective ports.

CAUTION: Data transmitted via a VCOM session over a USB–USB connection may be affected by your computer's power-saving activities. Either disable the power-saving mode while data is being transmitted, or verify that the data has been sent correctly when the computer wakes from power-saving mode.

Figure 86: Envoy X2 transceiver with MIL/STANAG 2G Data via VCOM over Ethernet cable



CAUTION: When VCOM is used over an Ethernet cable, the **RFU 6way MIL/STANAG 2G Data** and **RFU GP Port MIL/STANAG 2G Data** peripheral devices must not be selected on the respective ports.

Setting up the serial connection

Installing the driver for the cable

The USB–serial cable requires a specific driver to be installed on the computer. It is available on the RC50-C Installation CD or from www.ftdichip.com/Drivers/VCP.htm. Select the latest Windows®-certified driver that is suitable for your computer.

To install the driver for the cable:

- Insert the RC50-C Installation CD into the CD drive of the computer to which the cable is connected.
- Click on **Install RC50-C**.

  The driver comes packaged with the software. It remains present even if RC50-C is uninstalled.
- If the driver provided on the RC50-C Installation CD is not suitable for your computer, do the following:
  - Download a suitable Windows®-certified driver from www.ftdichip.com/Drivers/VCP.htm.
  - Double-click on the self-extracting .exe file.

  NOTE: Some older drivers are delivered as a zip file. Extract the files (using folder names) from the zip file. Right-click on the **ftdibus.inf** file, then select **Install**.

Identifying the COM ports used by a USB–serial connection

When you connect the computer to the device via a USB–serial cable, the computer recognises this as two COM ports. You must use the higher of the recognised COM ports when selecting a COM port for the email client.

To identify the numbers of the COM ports used by the USB port:

- On the desktop of the computer, right-click on the **My Computer** icon, select **Properties**—[**Hardware**]—**Device Manager**.
- Connect the USB cable between the device and the computer.
- Wait for two new ports to appear in the Device Manager under **Ports (COM & LPT)**.

  The higher COM port is used by the email client.

Selecting MIL/STANAG 2G Data as a peripheral device

MIL/STANAG 2G Data may be connected your computer via the RFU 6-way or RFU GP port connector using cable 08-07318-00x or 08-06952-00x respectively. You may also connect it to your computer using the Console GP port connector using cable 08-06952-00x. You must select the MIL/STANAG 2G Data Interface as a peripheral device for the connector.

CAUTION: The **MIL/STANAG 2G Data Interface** may only be used via one connector at a time. When using the modem via the Console GP port connector, ensure both the RFU GP port connector and RFU 6-way connector are not configured to **MIL/STANAG 2G Data Interface**, as the RFU GP port and RFU 6-way connectors take precedence for the modem interface (meaning the modem interface will not function via the Console GP port).

CAUTION: If the RFU 6-way port is used with serial cable 08-07318-00x, ensure that the **RFU GP Port MIL/STANAG 2G Data** peripheral device is not selected.

To select the peripheral device on either the RFU GP port connector, RFU 6-way connector or Console GP port connector:

- From the main menu, select (**User Data**), then (**Peripherals**).
- Press ◀ or ▶ to select (**RFU 6way**), (**RFU GP Port**), or (**Console GP Port**).
- Press ▲ or ▼ to scroll to the **MIL/STANAG 2G Data Interface** option, then press **OK**.
- Press (**Save**) to save the information.
- Restart the transceiver (if prompted), to activate the new settings.

Related links:

Overview of peripherals on page 234
Using VCOM services on page 135

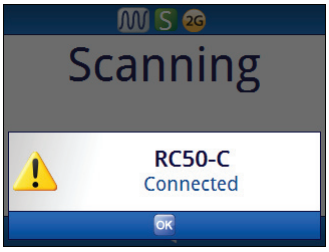
Sending email via RC50-C

An email message is sent via your email client to the RC50-C HF Email software, which passes it to the MIL/STANAG 2G Data processor. The processor passes the message to the transceiver, which transmits it over the air.

To send an email message:

- Launch the RC50-C HF Email software, then click **Go Online** to activate the MIL/STANAG 2G Data processor.

  The transceiver responds with a beep.

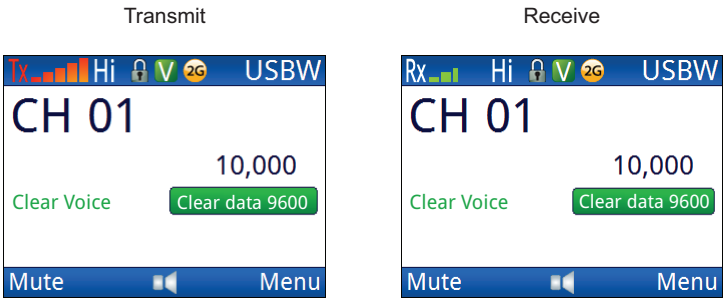


- Compose your email message in your email client software, for example Microsoft® Outlook®, then send it to the recipient.

  When a signal is transferred between the data modems across the link established by the transceivers, the current transmit or receive data rate is indicated on the right-hand side of the **Clear Data** indicator.

  While the message is being sent between the transceivers, activity is reported on the screen of the control point.

Figure 87: Transmit and receive screens during a MIL/STANAG 2G data call



NOTE: An AES-256 data encryption upgrade is available for use with the MIL/STANAG 2G Data interface.

NOTE: If you go off line in RC50-C, the modem may disconnect for 15 sec, then reconnect.

Related links:

AES-256 data encryption on page 461

RM50e HF Data Modem

The RM50e HF Data Modem provides data communications. It may also be used to provide high-grade AES-256 digital encryption. It may be used with any data-capable Codan HF transceiver. It must be used in conjunction with the RC50-C HF Email software. The data modem is capable of high-speed data transfer at speeds of up to 9600 bit/s using STANAG 4539 waveforms. The data modem also supports MIL-STD-188-110A/B (including Appendix F), STANAG 4285, STANAG 4529, and STANAG 4415 waveforms.

NOTE: When a data application is connected, an icon appears in the status bar of the channel screen ().

NOTE: The RM50e HF Data Modem may only be used via the RFU GP port connector.

Related links:

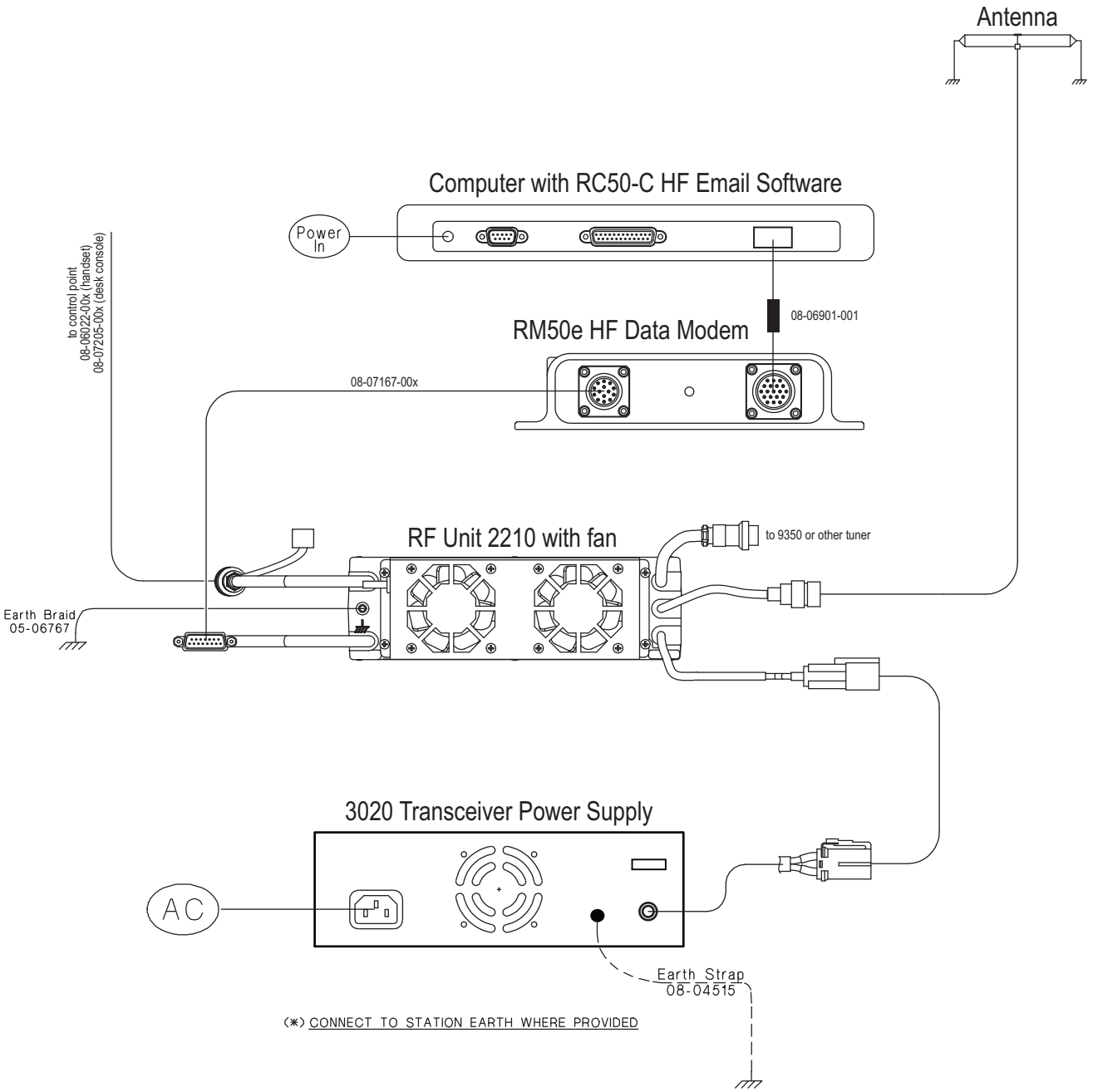
AES-256 data encryption on page 461
The channel screen on page 27

Typical RM50e data station

A typical RM50e data station comprises:

- any data-capable Codan HF transceiver
- an antenna system
- an appropriate 12 V DC power supply
- an RM50e HF Data Modem, selected as a peripheral device
- a computer with RC50-C HF Email software

Figure 88: Envoy X2 transceiver with RM50e HF Data Modem



NOTE: For more information on setting up and using an RM50e email station, please see the documentation provided with the modem and the RC50-C on-line help.

NOTE: To uninstall the RM50e modem, disconnect it from the transceiver, then use the CICS command (`dem uninstall`) to uninstall it from the transceiver's configuration data.

Related links:

Selecting a peripheral device on page 238

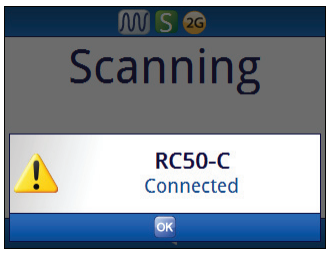
Sending email via RC50-C

An email message is sent via your email client to the RC50-C HF Email software, which passes it to the RM50e. The RM50e passes the message to the transceiver, which transmits it over the air. The RM50e can operate in clear or secure mode.

To send an email message:

- Launch the RC50-C HF Email software, then click **Go Online** to activate the RM50e HF Data Modem.

  The transceiver responds with a beep.

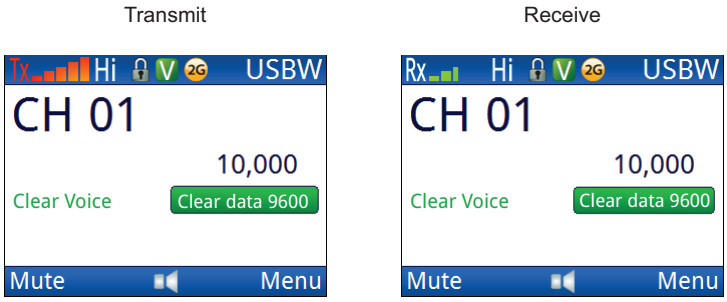


- Compose your email message in your email client software, for example Microsoft® Outlook®, then send it to the recipient.

  When a signal is transferred between the data modems across the link established by the transceivers, the current transmit or receive data rate is indicated on the right-hand side of the **Clear Data** indicator.

  While the message is being sent between the transceivers, activity is reported on the screen of the control point.

Figure 89: Transmit and receive screens during an RM50e data call



Related links:

AES-256 data encryption on page 461

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21 Encryption options

This section contains the following topics:

Overview of encryption

NOTE: You must have the CES or AES hardware option fitted and the option enabled in the transceiver's firmware to use these methods of encryption.

NOTE: You must have the CIVS option enabled in the transceiver's firmware to use this method of voice scrambling.

In order to communicate securely between two stations, both stations must use the same channel frequency and secure key or code. The CES and AES encryptors may be programmed with multiple secure keys, any one of which may be selected. For secure communications within your organisation you must set up secure keys that are common to all transceivers in your organisation. CIVS uses standard codes that provide a basic level of voice scrambling. You can select a different code for the scrambling, but you cannot change the codes to make them unique to your organisation.

When you switch on secure mode, all encryptors/scramblers that are activated in your transceiver go secure.

NOTE: Codan's KMS may be used to generate secure keys and to fill the CES and AES DV and data encryptors. KFS may be used to fill keys to these encryptors.

NOTE: VCOM is used to provide virtual COM ports for programming secure keys via KMS/KFS over the USB connector on the control point.

You can pre-set:

- the tasks that an operator may perform at user level
- the status of encryption at power up and when scanning is switched off
- the secure key prefixes
- whether or not encryption can be switched off

Table 19: Summary of the encryption options

Sales Option	Encryptor Type	Tab Icon	When encryptor is switched off...	When encryptor is switched on...
Voice Scrambler (15-10551)	CIVS		Clear analogue voice	Scrambled analogue voice
CES-128 Encryptor (15-10564)	CES-128		Clear analogue voice	Secure (scrambled) analogue voice
AES-256 DV Encryptor (15-10565)	AES-256		Clear analogue voice	Secure digital voice

Table 19: Summary of the encryption options (cont.)

Sales Option	Encryptor Type	Tab Icon	When encryptor is switched off...	When encryptor is switched on...
MIL/STANAG 2G Data (15-10589) Upgrade, AES-256 Encryption (15-10595)	AES-256		Clear data	Secure data
DV (15-10591) Upgrade, AES-256 Encryption (15-10595)	AES-256		Clear analogue voice	Secure digital voice
MIL/STANAG 2G Data + DV (15-10590) Upgrade, AES-256 Encryption (15-10595)	AES-256		Clear analogue voice Clear data	Secure digital voice Secure data
–	AES-256 (RM50e)		Clear data	Secure data
–	DVP-200		Clear analogue voice	Secure digital voice

The scrambler/encryptors have some common features and some module-specific features.

Table 20: Features available with CIVS scrambling, and CES and AES encryption

Feature	CIVS Voice	CES-128 Voice	AES-256 DV	AES-256 Data	DVP-200 Voice
Secure mode	N/A	Global/Corporate	N/A	N/A	N/A
Base key	N/A	Yes	N/A	N/A	N/A
PIN for secure session	N/A	Optional	N/A	N/A	N/A
Standby mode (including clear Tx)	N/A	Yes	N/A	N/A	N/A

Table 20: Features available with CIVS scrambling, and CES and AES encryption (cont.)

Feature	CIVS Voice	CES-128 Voice	AES-256 DV	AES-256 Data	DVP-200 Voice
Setting secure status at power up	Yes	Yes	Yes	Yes	Yes
Selecting secure key/code	Yes	Yes	Yes	Yes	Yes
Editing secure key	N/A	Yes	Yes	Yes	No
Erasing secure key	N/A	Yes (individual or all)	Yes (all)	Yes (all)	Yes (all)
Setting/Locking digital voice data rate	N/A	N/A	Yes	N/A	Yes
Setting/Locking digital voice mute	N/A	N/A	Yes	N/A	Yes
Setting digital mute status at power up	N/A	N/A	Yes	N/A	Yes

Related links:

Viewing the COM port setting in VCOM on page 407

Secure key

A secure key is a sequence of characters that is used by a CES-128 encryption algorithm to encrypt voice, or an AES-256 encryption algorithm to encrypt voice or data. The secure key is contained in an index. The index provides a means of identifying the key, for example **Corp-01** or **TEK001**. The prefix of the key index can be set in **Settings** > **Security** > **CES Key Prefix** and **Settings** > **Security** > **Digital Key Prefix**.

Typically, each station is programmed with the same key set so that when a particular index is selected at any station, the key stored within is the same. Stations need to use the same key to provide end-to-end secure communication.

The format of a secure key depends upon the encryptor with which it is used.

Table 21: Properties of a secure key in CES-128 and AES-256 encryption

Properties	CES-128 Voice Encryption	AES-256 DV/Data Encryption
Length of key	Index 1: 8 digits Index 2 to 98: 16 digits	64 characters
Characters	Numeric	Hexadecimal (A–F, 0–9)

NOTE: Codan's KMS may be used to generate secure keys and to fill the CES and AES DV and data encryptors. KFS may be used to fill keys to these encryptors.

NOTE: VCOM is used to provide virtual COM ports for programming secure keys via KMS/KFS over the USB connector on the control point.

Secure keys may also be entered via the user interface of the control point, if permitted. You can also replace a secure key with a new string of characters. You cannot read existing secure keys.

CAUTION: If you edit a key, you must make the same change to the same key in all other transceivers that want to communicate securely with this station.

NOTE: To program encryption key sets into the Envoy transceiver, it is recommended to use a FAT32 formatted USB thumb drive and a USB OTG adaptor (Codan part number: 67-90406).

Related links:

Adding a secure key on page 433
Selecting a secure key on page 434
Editing a secure key on page 435
Setting the CES key prefix on page 450
Setting the digital key prefix on page 459
Viewing the COM port setting in VCOM on page 407

Using encryption

Related links:

Switching the secure feature on or off on page 428
Selecting an encryptor on page 432
Adding a secure key on page 433
Selecting a secure key on page 434
Editing a secure key on page 435
Deleting a secure key on page 436

Switching the secure feature on or off

The 2220 Handset and 2230 Desk Console have a hot key that accesses the secure feature directly. With the 2221 Handset, you access the secure feature by pressing (**Options**), or via (**Functions**) on the main menu screen. When you switch on secure mode, all encryptors/scramblers that are activated in your transceiver go secure. When AES-256 DV and data encryptors are used at the same time, they use the same secure key.

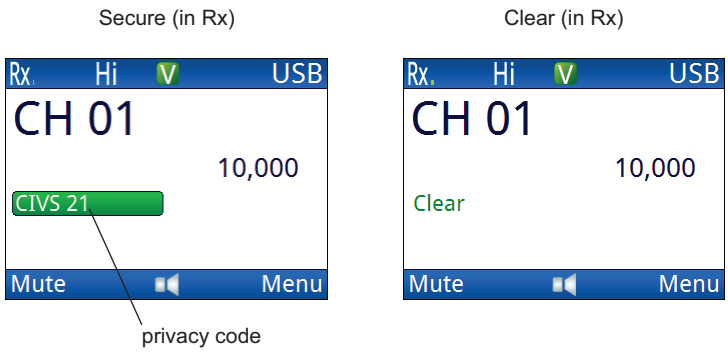
If you want secure to remain on at all times, you set this in **Settings** > **Security** > **Secure Start State**.

To switch the secure feature on or off:

- If you are using a 2220 Handset or 2230 Desk Console, press SEC.
- If you are using a 2221 Handset:
  - Press (**Options**).
  - Press ▲ or ▼ to scroll to the **Secure On** | **Secure Off** option.
  - Press (**Select**).

  Secure is toggled on or off across all active encryptors/scramblers.

  For CIVS voice scrambling you will see:

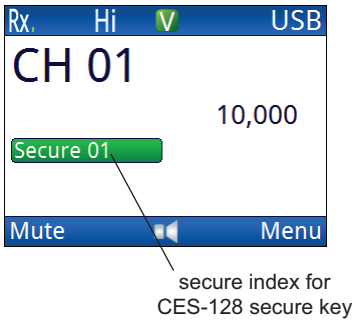


Transmit (while secure)

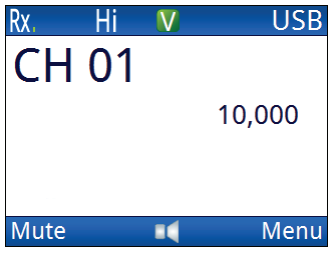
Receive (while secure)

For CES-128 voice encryption you will see:

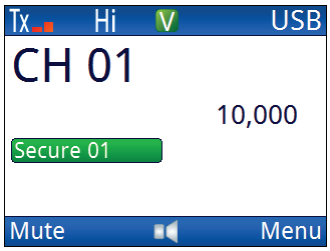
Secure (in Rx)



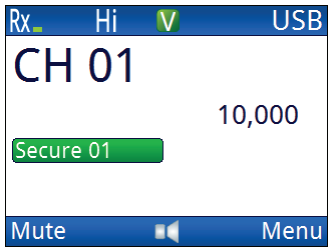
Clear (in Rx)



Transmit (while secure)

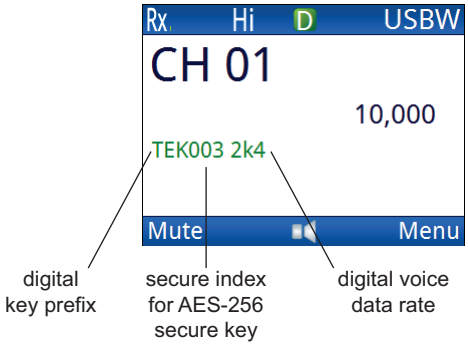


Receive (while secure)

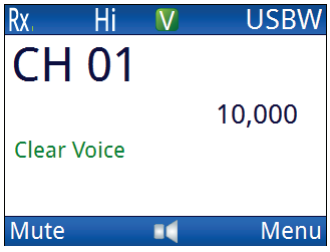


For AES-256 digital voice you will see:

Analogue (in Rx)



Clear (in Rx)

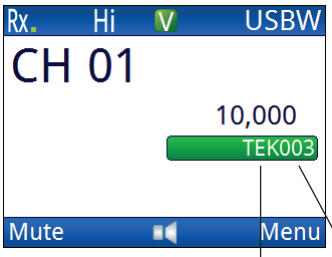


Transmit (while secure)

Receiving DV (while secure)

For AES-256 data encryption you will see:

Secure (in Rx)

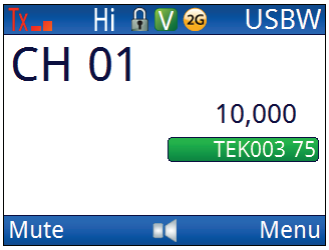


Clear (in Rx)

digital key prefix

secure index for AES-256 data secure key

Transmit (while secure)



Receive (while secure)

For DVP-200 you will see:

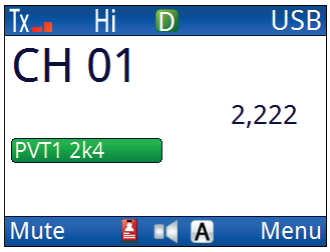
Secure (in Rx)

Clear (in Rx)

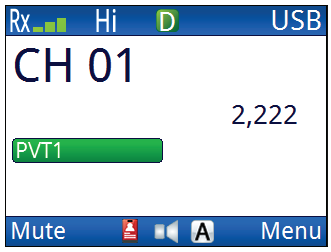
secure index for DVP-200 secure key

DVP-200 data rate

Transmit (while secure)



Receive (while secure)



NOTE: If you have more than one encryptor/scrambler available for activation, you can change to another encryptor/scrambler, if permitted.

- If you are using CES-128 voice encryption with a 2220 Handset or 2230 Desk Console, press ✱to go to secure standby mode, if enabled and required.

Standby

- If you are using CES-128 voice encryption with a 2221 Handset, do the following to go to secure standby mode:
  - Press (**Options**).
  - Press ▲ or ▼ to scroll to the **Standby On** option.
  - Press (**Select**).

Related links:

Selecting an encryptor on page 432
CIVS voice scrambler on page 445
CES-128 voice encryption on page 448
AES-256 encryption for digital voice on page 460
AES-256 data encryption on page 461
Secure Start State on page 373
Setting the secure state of scrambler/encryptors at power up on page 442
Standby mode on page 453
Entering a PIN for a secure session on page 452

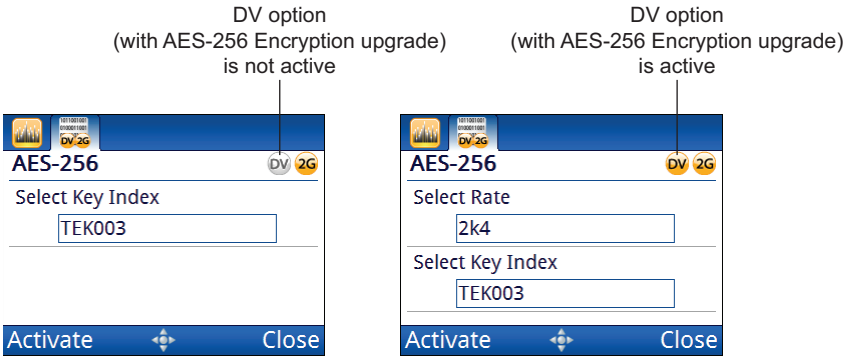
Selecting an encryptor

You can select the type of encryptor or scrambler that you want to use. This selection can be made across available voice encryptors/scramblers, and across data encryptors.

NOTE: The ability to select an encryptor or scrambler at user level is set in **Settings** > **Security** > **General Options** > **Allow user to select encryptor type**.

To select an encryptor:

- If you are using a 2220 Handset or 2230 Desk Console, do *one* of the following:
  - From the main menu,select (**General**), then (**Secure**).
  - *Hold* SEC.
- If you are using a 2221 Handset:
  - From the main menu, select (**Functions**).
  - Press ▲ or ▼ to scroll to the **Secure Info** function.
  - Press (**Select**).
- Press ▲ to move from the list of entries to select the tab.
- Press ◄ or ► to select the scrambler/encryptor tab that you want to use.



- Press (**Activate**).

  If you are changing the voice encryptor/scrambler, you are prompted to confirm this change.

Related links:

Enabling encryptor selection on page 439

Adding a secure key

NOTE: Codan's KMS may be used to generate secure keys and to fill the CES and AES DV and data encryptors. KFS may be used to fill keys to these encryptors.

NOTE: VCOM is used to provide virtual COM ports for programming secure keys via KMS/KFS over the USB connector on the control point.

NOTE: Only one application connected via VCOM may be serviced by the RFU at a time. Refer to *Using VCOM services* on page 135 for further details on this limitation.

NOTE: Secure keys can also be programmed from the Codan Convoy Web Portal or from a USB stick. Refer to *Upgrading the transceiver via a USB stick* on page 125 for more information about programming secure keys from a USB stick.

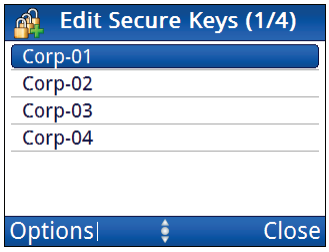
If you are permitted to add a secure key for a CES-128 or AES-256 encryptor via the user interface of the control point, the transceiver automatically selects the next empty secure index into which you can enter a secure key. You cannot select the secure key index.

NOTE: AES-256 DV and data encryptors use the same secure key.

NOTE: You cannot add keys for the DVP-200 via the control point, KMS/KFS or Codan Convoy.

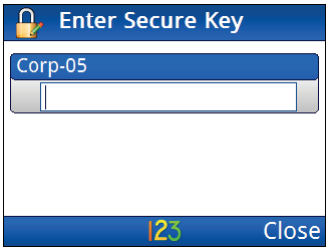
To add a secure key:

- If you are using a 2220 Handset or 2230 Desk Console, do *one* of the following:
  - From the main menu,select (**General**), then (**Secure**).
  - *Hold* SEC.
- If you are using a 2221 Handset:
  - From the main menu, select (**Functions**).
  - Press ▲ or ▼ to scroll to the **Secure Info** function.
  - Press (**Select**).
- Press ▲ or ▼ to scroll to the **Edit Keys** entry.
- Press ▶.



- Press (**Options**), scroll to **Add** , then press (**Select**).

NOTE: If all secure key indexes contain a key, **Add** is not shown as an option.



- Enter the charactersthat you want to usefor the secure key.
- Press (**Save**) to save the information.
- Press (**Close**).

Related links:

Setting user access to encryptor features on page 438
Editing a secure key on page 435
Entering text in a field on page 152
Entering text with the 2221 Handset on page 155
Entering text with a USB keyboard on page 156
Viewing the COM port setting in VCOM on page 407
Using VCOM services on page 135

Selecting a secure key

If an encryptor contains two or more keys, you have the option of selecting a different key for encryption, if permitted. When AES-256 DV and data encryptors are used together, the selected key is common to both.

NOTE: Secure keys can also be selected from the Codan Convoy Web Portal.

NOTE: With DVP-200, all 8 private keys will always be available for selection, and the public key will also be available if a successful public key exchange has been performed. However, these private keys may not be valid. In this case, the text in the status area will indicate the selected key, but it will flash in a similar manner as the DVP-200 front panel.

To select a secure key:

- If you are using a 2220 Handset or 2230 Desk Console, do *one* of the following:
  - From the main menu,select (**General**), then (**Secure**).
  - *Hold* SEC.

- If you are using a 2221 Handset:
  - From the main menu, select (**Functions**).
  - Press ▲ or ▼ to scroll to the **Secure Info** function.
  - Press (**Select**).
- Press ▲ or ▼ to scroll to the **Select Key Index** entry.

- Press ◀ or ▶ to select thesecure key indexthat you want to use.

  Hold the key to scroll rapidly through the secure key indexes.
- Press (**Activate**).

  The transceiver goes secure on the selected key.

Related links:

Setting user access to encryptor features on page 438
Changing the privacy code on page 446

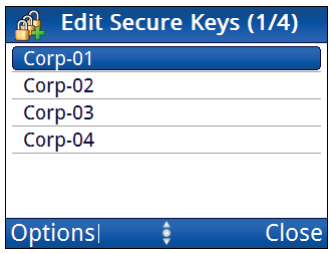
Editing a secure key

If permitted, you can replace the content of a secure key index with a new key.

To edit a secure key:

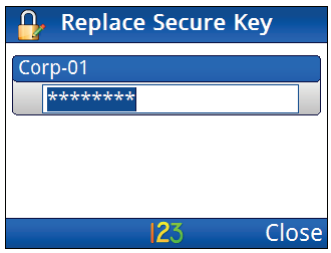
- If you are using a 2220 Handset or 2230 Desk Console, do *one* of the following:
  - From the main menu, select (**General**), then (**Secure**).
  - *Hold* SEC.
- If you are using a 2221 Handset:
  - From the main menu, select (**Functions**).
  - Press ▲ or ▼ to scroll to the **Secure Info** function.
  - Press (**Select**).
- Press ▲ or ▼ to scroll to the **Edit Keys** entry or **Edit First Key** entry.

- Press ▶.



- If you can edit more than the first key:
  - Press ▲ or ▼ to scroll to the secure key index that you want to edit.

    Hold the key to scroll rapidly through the secure key indexes.
  - Press (**Options**), scroll to **Edit**, then press (**Select**).



- Enter the characters that you want to use for the secure key.
- Press (**Save**) to save the information.
- Press (**Close**).

Related links:

Setting user access to encryptor features on page 438
Secure key on page 426
Entering text in a field on page 152
Entering text with the 2221 Handset on page 155

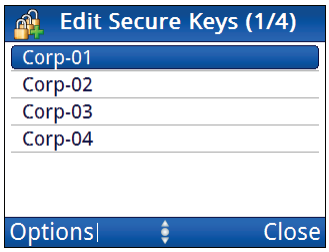
Deleting a secure key

If permitted, you can delete a secure key. Depending on the encryptor, you can delete a single secure key, or all of the secure keys.

NOTE: If permitted, you can delete all of the secure keys using the ⏻ + SEC hot-key sequence.

To delete a secure key:

- If you are using a 2220 Handset or 2230 Desk Console, do *one* of the following:
  - From the main menu, select (**General**), then (**Secure**).
  - *Hold* SEC.
- If you are using a 2221 Handset:
  - From the main menu, select (**Functions**).
  - Press ▲ or ▼ to scroll to the **Secure Info** function.
  - Press (**Select**).
- Press ▲ or ▼ to scroll to the **Edit Keys** entry.
- Press ▶.



- If you are able to delete a single secure key:
  - Press ▲ or ▼ to scroll to the secure key index that you want to delete.
  - Press (**Options**), scroll to **Delete**, then press (**Select**).
- If you are able to delete all secure keys, press (**Delete All**).
- Confirm that you want to delete the secure key(s).
- Press (**Close**).

Related links:

Setting user access to encryptor features on page 438
Enabling a hot-key sequence for erasing secure keys on page 440

Setting up encryption

Related links:

Setting user access to encryptor features on page 438
Enabling encryptor selection on page 439
Enabling a hot-key sequence for erasing secure keys on page 440
Setting the encryptor to be secure at all times on page 441
Setting the secure state of scrambler/encryptors at power up on page 442
Programming secure keys on page 443

Setting user access to encryptor features

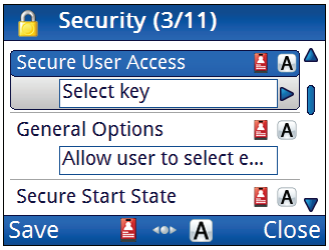
You can select the features that you want to allow the user to perform, or you can prevent access to these features.

The user may be given access to:

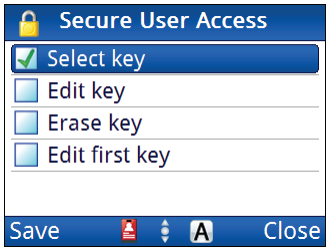
- select a secure index that contains a key, or a select a code
- edit just the first key, or any of the keys in the secure indexes
- erase one or all of the secure keys and indexes

To select the features that you want the user to be able to perform:

- From the main menu, select (**Settings**), then (**Security**).
- Press ▲ or ▼ to scroll to the **Secure User Access** entry.



- Press ▶.
- Press ▲ or ▼ to scroll to the value that you want to set, then press **OK** to select the check box.



When the check box is selected, the item is enabled. When the check box is clear, the item is disabled.

You can select multiple values.

- Press (**Save**) to save the information.
- Press (**Close**).

Related links:

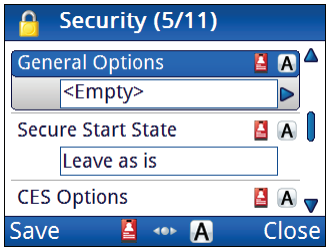
Logging in to admin level on page 146
Secure User Access on page 372

Enabling encryptor selection

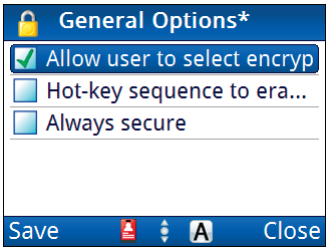
If you want the user to be able to select the type of encryptor at the time of use, enable this feature. When enabled, the user will be able to select the encryptor by *holding* SEC, or via **Functions** > **Secure Info** (2221 only).

To enable encryptor selection:

- From the main menu, select (**Settings**), then (**Security**).
- Press or to scroll to the **General Options** entry.



- Press .
- Press or to scroll to the **Allow user to select encryptor type** value, then press **OK** to select the check box.



When the check box is selected, the item is enabled. When the check box is clear, the item is disabled.

- Press (**Save**) to save the information.
- Press (**Close**).

Related links:

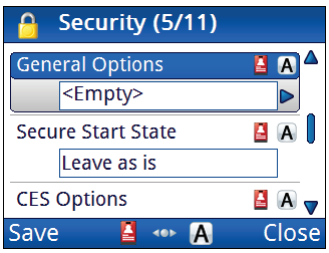
Selecting an encryptor on page 432
Logging in to admin level on page 146
General Options on page 373

Enabling a hot-key sequence for erasing secure keys

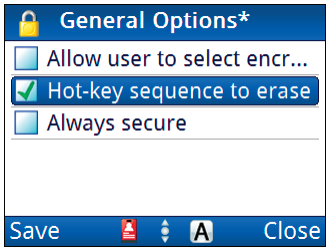
If you want the user to be able to erase all secure keys quickly, enable the + SEC hot-key sequence.

To enable the hot-key sequence:

- From the main menu, select (**Settings**), then (**Security**).
- Press or to scroll to the **General Options** entry.



- Press .
- Press or to scroll to the **Hot-key sequence to erase keys** value, then press **OK** to select the check box.



When the check box is selected, the item is enabled. When the check box is clear, the item is disabled.

- Press (**Save**) to save the information.
- Press (**Close**).

Related links:

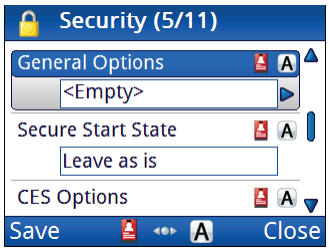
Deleting a secure key on page 436
Logging in to admin level on page 146
General Options on page 373

Setting the encryptor to be secure at all times

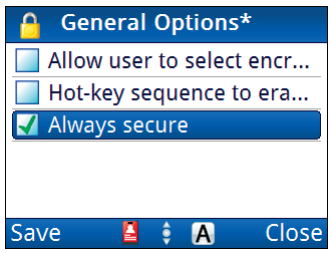
If you want the encryptor to be in secure mode at all times, enable this feature.

To set the encryptor to constant secure mode:

- From the main menu, select (**Settings**), then (**Security**).
- Press or to scroll to the **General Options** entry.



- Press .
- Press or to scroll to the **Always secure** value, then press **OK** to select the check box.



When the check box is selected, the item is enabled. When the check box is clear, the item is disabled.

- Press (**Save**) to save the information.
- Press (**Close**).

Related links:

Logging in to admin level on page 146
General Options on page 373

Setting the secure state of scrambler/encryptors at power up

You can set the state of the active scrambler/encryptors when the transceiver is powered up.

To set the secure state of the scrambler/encryptors at power up:

- From the main menu, select (**Settings**), then (**Security**).
- Press or to scroll to the **Secure Start State** entry.

- Press or to select the value that you want to use from the following:
  - To return to the secure state that the scrambler/encryptor was in prior to the transceiver being switched off, select **Leave as is**.
  - To always enter secure mode at power up, select **Secure on**.
  - To remain clear at power up, select **Secure off**.

- Press (**Save**) to save the information.
- Press (**Close**).

Related links:

Logging in to admin level on page 146
Secure Start State on page 373

Programming secure keys

Secure keys may be programmed to the CES or AES encryptor using KMS or KFS. These programs connect to the transceiver via a serial, USB, or Ethernet cable. If a USB or Ethernet cable is used, VCOM is required to provide the virtual COM port for the transfer of keys. If you have more than one encryptor module fitted in your transceiver, it is recommended that you use a USB storage device for programming secure keys.

For information on how to generate (KMS only) and program secure keys, see the on-line help provided with KMS/KFS.

NOTE: If you are programming secure keys for the AES-256 data encryptor only (that is, without digital voice), you must restart the transceiver after programming the keys.

NOTE: If you are programming secure keys for the AES-256 data encryptor only (that is, without digital voice), you must restart the transceiver after programming the keys.

NOTE: Secure keys can also be programmed from the Codan Convoy Web Portal or from a USB stick. Refer to *Upgrading the transceiver via a USB stick* on page 125 for more information about programming secure keys from a USB stick.

Related links:

Upgrading the transceiver via a USB stick on page 125

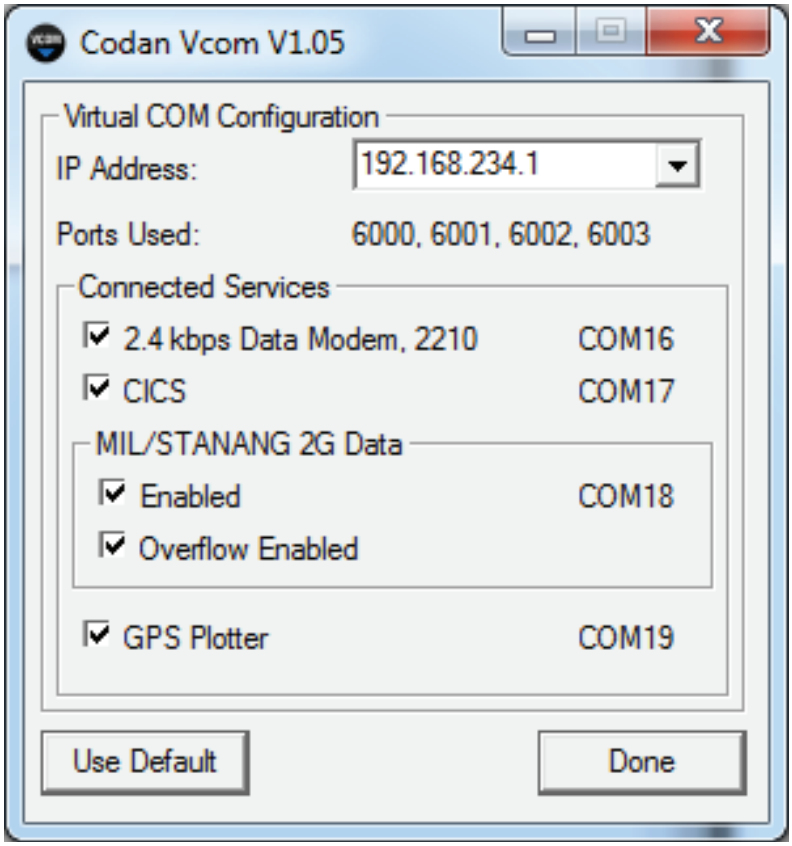
Viewing the COM port setting in VCOM

VCOM provides virtual serial COM ports to enable serial protocols to be used over other protocols, for example, USB and Ethernet. VCOM operates on Windows® 7.

When VCOM launches, it assigns a virtual COM port for use by internal devices in the Envoy transceiver. This port number must be set up in other programs used for data communication over HF and secure key programming.

To view the virtual COM port setting:

- Launch **VCOM Configuration** from **Start** > **All Programs** > **Codan** > **VCOM**.



- Record the value of the COM port used for the device in the **Connected Services** frame.

  This value is entered as the COM port in the relevant application communicating with the Envoy transceiver.

  NOTE: CICS is used for secure key programming via KMS and KFS.

- Click **Done** to close the VCOM Configuration utility.

CIVS voice scrambler

NOTE: The CIVS option may be installed with CES and AES encryptors.

NOTE: The use of the CIVS voice scrambler is not recommended across VHF/UHF to HF communication links.

CIVS provides cost-effective, software-enabled voice scrambling. It is simple to use, and provides a basic level of voice security. You can select from one of 32 fixed codes that offer different levels of security. Lower CIVS code levels are more secure than higher CIVS code levels.

Figure 90: Channel screen showing secure/clear status for CIVS voice scrambler

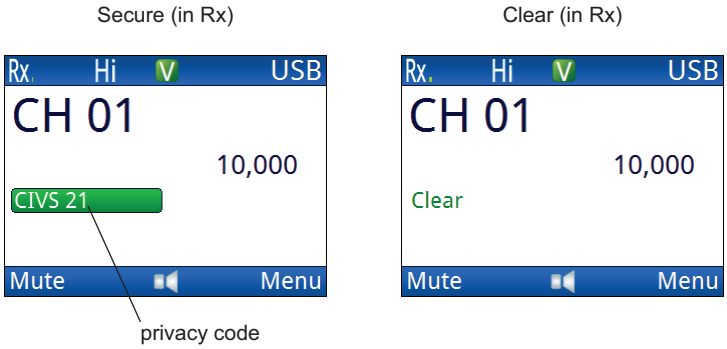
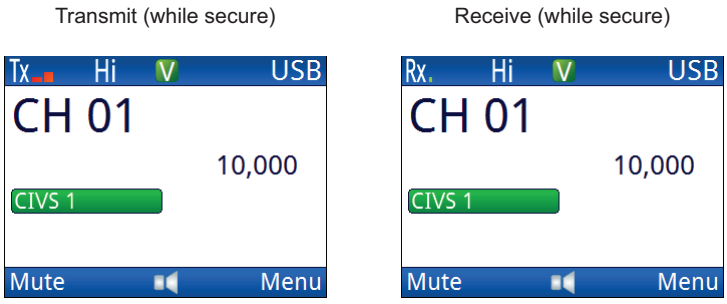


Figure 91: Channel screen showing transmit/receive status for CIVS voice scrambler



Related links:

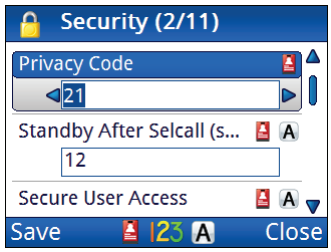
Switching the secure feature on or off on page 428

Setting the privacy code for CIVS

The privacy code is used when CIVS is activated. This can be changed while CIVS is active.

To set the privacy code:

- From the main menu, select (**Settings**), then (**Security**).
- Press ▲ or ▼ to scroll to the **Privacy Code** entry.



- Press ◄ or ► to select the code that you want to use for the CIVS scrambler.
- Press (**Save**) to save the information.
- Press (**Close**).

Related links:

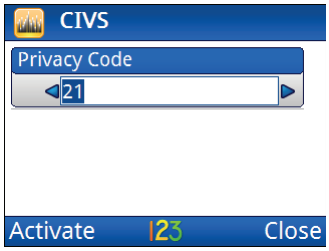
Logging in to admin level on page 146
Privacy Code on page 372
Changing the privacy code on page 446

Changing the privacy code

The CIVS scrambler operates on one of 32 codes. You can change the current privacy code, if permitted.

To change the privacy code:

- If you are using a 2220 Handset or 2230 Desk Console, do *one* of the following:
  - From the main menu, select (**General**), then (**Secure**).
  - *Hold* SEC.
- If you are using a 2221 Handset:
  - From the main menu, select (**Functions**).
  - Press ▲ or ▼ to scroll to the **Secure Info** function.
  - Press (**Select**).
- Press ▲ or ▼ to scroll to the **Privacy Code** entry.



- Press ◀ or ▶ to select the code that you want to use.

  Hold the key to scroll rapidly through the codes.

- Press ⌣ (**Activate**).

  The transceiver goes secure on the selected code.

Related links:

CIVS voice scrambler on page 445
Setting the privacy code for CIVS on page 445
Setting user access to encryptor features on page 438

CES-128 voice encryption

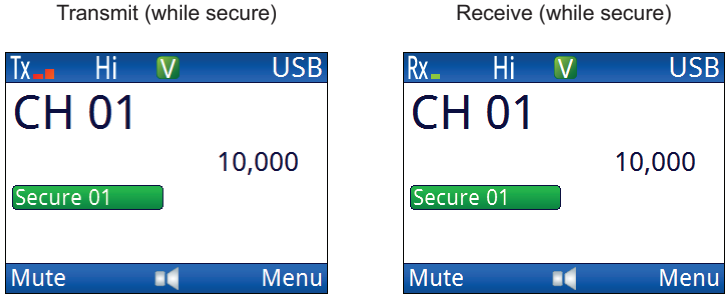
NOTE: CES-128 voice encryption may be used in conjunction with AES-256 data encryption, and the CIVS scrambler.

NOTE: VCOM is used to provide virtual COM ports for programming secure keys via KMS/KFS over the USB connector on the control point.

CES-128 voice encryption is an optional feature that provides high-grade security for voice communications. This feature uses CES-128 secure keys, secure modes, and PINs to provide various levels of secure communications. The CES-128 voice encryptor may be programmed with multiple secure keys, any one of which may be selected. In addition to the secure keys, the CES-128 voice encryptor provides a PIN facility.

Figure 92: Channel screen showing secure/standby/clear status for CES-128 voice encryption

Figure 93: Channel screen showing transmit/receive status for CES-128 voice encryption



Related links:

Secure mode on page 449
Setting the CES key prefix on page 450
PIN for secure session on page 451
Standby mode on page 453
Base key on page 457
Switching the secure feature on or off on page 428
CES Options on page 374
Viewing the COM port setting in VCOM on page 407

Secure mode

CES-128 encryption may operate in one of two modes: Corporate or Global. You can set the secure mode in **Settings** > **Security** > **CES-128 Mode**.

For secure communications within your organisation you must set up secure keys in the Corporate secure indexes. These must be common to all transceivers in your organisation. Corporate secure mode is a secure session that uses a key stored in one of the Corporate secure indexes and the Base key as the seed for the encryption algorithm. The CES-128 voice encryptor can store a secure key in up to 98 Corporate secure indexes. Each key may contain up to 16 digits, except the first key, which accepts only 8 digits.

If you need to have secure communications with other organisations operating the same type of equipment as yours, you can use the fixed Global secure key that is common to all CES-128 voice encryptors shipped from Codan. The Global secure key provides secure communications, however, the security is less than that provided by a secure key in a Corporate secure index. The PIN facility may also be used with the Global secure key to increase the level of security.

NOTE: The Global secure mode does not use the Base secure key in its encryption algorithm.

Related links:

Setting the CES-128 mode on page 449
CES Key Prefix on page 374
Base key on page 457

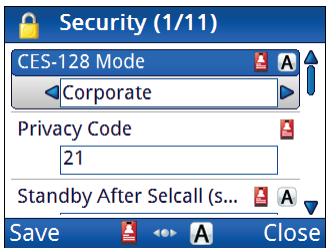
Setting the CES-128 mode

CES-128 voice encryption operates in one of two modes: Corporate or Global.

NOTE: If it is standard operating procedure for users to switch between Global and Corporate modes on-the-fly, set up a macro to toggle the **CES-128 Mode** entry.

To set the CES-128 mode:

- From the main menu, select (**Settings**), then (**Security**).
- Press ▲ or ▼ to scroll to the **CES-128 Mode** entry.



- Press ◀ or ▶ to select the secure mode that you want to use for the CES-128 encryptor.
- Press (**Save**) to save the information.
- Press (**Close**).

Related links:

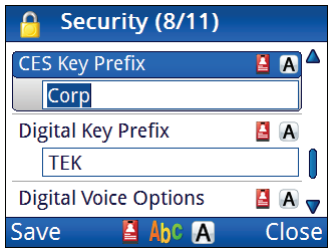
Logging in to admin level on page 146
Secure mode on page 449
Creating a macro to toggle a setting on page 279
CES-128 Mode on page 371

Setting the CES key prefix

A secure key is contained within a secure index. This index has a name that is used to identify it. The name comprises a prefix followed by a sequential number. The CES key prefix applies to all key indexes used by the CES-128 encryptor in the transceiver. The default CES key prefix is Corp.

To set the CES key prefix:

- From the main menu, select (**Settings**), then (**Security**).
- Press ▲ or ▼ to scroll to the **CES Key Prefix** entry.



- Enter the prefix that you want to use.

  You may enter up to 4 alphanumeric characters.
- Press (**Save**) to save the information.
- Press (**Close**).

Related links:

Logging in to admin level on page 146
CES Key Prefix on page 374

PIN for secure session

A PIN temporarily varies the level of privacy for a secure session. The PIN may be up to 4 digits, and is only valid for the current secure session. The same, or a different PIN, may be used at the next secure session. It must be entered for each private session. Every party to the secure session must use the same PIN for successful secure communication. The PIN may be entered at the time of going secure, or it may be entered during a secure session to enable a more private conversation within the Corporate or Global secure mode. Parties must know what PIN they intend to use without mentioning it over the air.

Related links:

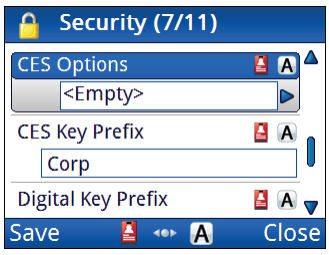
Enabling the use of a PIN for a secure session on page 451
Entering a PIN for a secure session on page 452
CES Options on page 374

Enabling the use of a PIN for a secure session

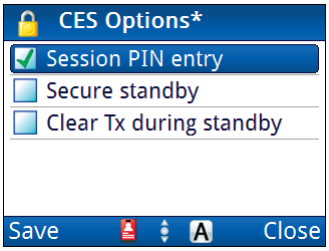
If you want the user to be able enter a PIN so that they may have additional privacy for their conversation, enable this feature.

To enable the use of a session PIN:

- From the main menu, select (**Settings**), then (**Security**).
- Press ▲ or ▼ to scroll to the **CES Options** entry.



- Press ▶.
- Press ▲ or ▼ to scroll to the **Session PIN entry** value, then press **OK** to select the check box.



When the check box is selected, the item is enabled. When the check box is clear, the item is disabled.

- Press (**Save**) to save the information.
- Press (**Close**).

Related links:

Logging in to admin level on page 146
CES Options on page 374
Entering a PIN for a secure session on page 452

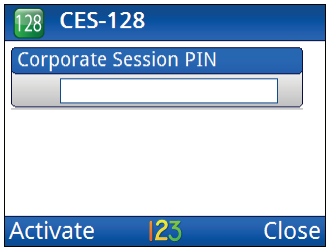
Entering a PIN for a secure session

If you have CES-128 voice encryption, you can enter a PIN for a secure session to provide additional privacy, if permitted. Stations must use the same PIN in the session for successful secure communications. The PIN may be entered as you go secure, or while in a secure session. The PIN is valid for the current secure session only.

CAUTION: You must re-enter a PIN each time you go secure if you want to use this additional privacy.

To enter a PIN for a secure session:

- If you are using a 2220 Handset or 2230 Desk Console, do *one* of the following:
  - From the main menu,select (**General**), then (**Secure**).
  - *Hold* SEC.
- If you are using a 2221 Handset:
  - From the main menu, select (**Functions**).
  - Press or to scroll to the **Secure Info** entry.
  - Press (**Select**).



- Enter up to 4 digits.
- Press (**Activate**).

  The transceiver goes secure on the selected key.

Related links:

CES Options on page 374

Standby mode

CES-128 voice encryption provides a standby mode in which the transceiver receives signals in clear, and automatically switches to secure mode if it detects a secure transmission. When the encryptor is in standby mode, any transmissions that you make will be in secure mode, by default. If you want transmissions to be in clear mode while the encryptor is in standby mode, you can set this in **Settings** > **Security** > **CES Options**.

A brief standby period may be set following a call made in an HF network using a Selcall call system. This period enables you to hear the revertives that are sent from the called station. The encryptor returns to secure mode after the standby period. The standby period is set in **Settings** > **Security** > **Standby After Selcall**.

The encryptor allows secure operation to remain on during scanning. Secure standby mode is permitted and remains on until ✱ is pressed again.

Related links:

Using secure standby on page 455
Enabling access to secure standby on page 454
Enabling clear transmissions during secure standby on page 454
Setting the duration of secure standby for a Selcall HF network on page 456
Standby After Selcall on page 372
CES Options on page 374

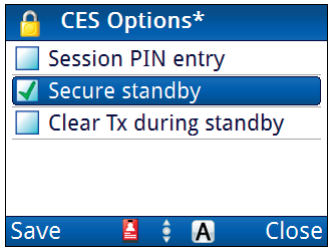
Enabling access to secure standby

Secure standby mode is available for CES-128 voice encryption only.

To enable access to secure standby mode:

- From the main menu, select (**Settings**), then (**Security**).
- Press ▲ or ▼ to scroll to the **CES Options** entry.

- Press ▶.
- Press ▲ or ▼ to scroll to the **Secure standby** value, then press **OK** to select the check box.



When the check box is selected, the item is enabled. When the check box is clear, the item is disabled.

- Press (**Save**) to save the information.
- Press (**Close**).

Related links:

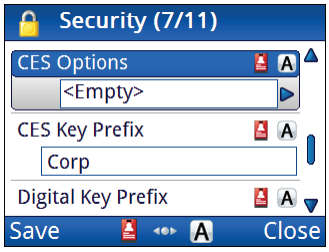
Logging in to admin level on page 146
CES Options on page 374

Enabling clear transmissions during secure standby

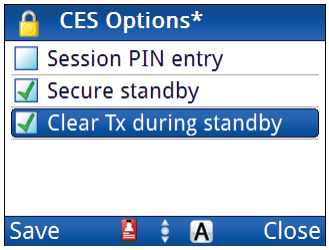
If you want the user to be able to make transmissions that are not secure while the transceiver is in standby mode, enable this feature.

To enable clear transmissions in standby mode:

- From the main menu, select (**Settings**), then (**Security**).
- Press ▲ or ▼ to scroll to the **CES Options** entry.



- Press ▶.
- Press ▲ or ▼ to scroll to the **Clear Tx during standby** value, then press **OK** to select the check box.



When the check box is selected, the item is enabled. When the check box is clear, the item is disabled.

NOTE: If you select **Clear Tx during standby**, you must also select **Secure standby**.

- Press (**Save**) to save the information.
- Press (**Close**).

Related links:

Logging in to admin level on page 146
CES Options on page 374

Using secure standby

Secure standby mode is available with the CES-128 voice encryptor only. It is accessed via secure mode.

To use secure standby mode:

- Switch on secure mode.
- If you are using a 2220 Handset or 2230 Desk Console, press ✱ to go to secure standby mode.
- If you are using a 2221 Handset, do the following to go to secure standby mode:
  - Press (**Options**).
  - Press ▲ or ▼ to scroll to the **Standby On** option.
  - Press (**Select**).

- If you are using a 2220 Handset or 2230 Desk Console, press ✱ to exit secure standby mode and return to secure mode.
- If you are using a 2221 Handset, do the following to exit secure standby mode and return to secure mode:
  - Press (**Options**).
  - Press ▲ or ▼ to scroll to the **Standby Off** option.
  - Press (**Select**).

Related links:

Switching the secure feature on or off on page 428
Enabling access to secure standby on page 454

Setting the duration of secure standby for a Selcall HF network

If your HF communication network operates with the Codan Selcall call system, you will not hear revertives from the called station when secure mode is active. You can set a brief period following a call made in a Codan Selcall HF network during which the transceiver enters secure standby, receives revertives, then returns to secure mode.

NOTE: This feature operates independently of **Settings** > **Security** > **CES Options** > **Secure Standby**.

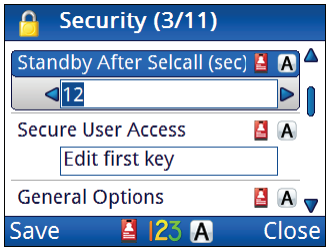
The transceiver returns to secure mode after any one of the following:

- the end of the period is reached
- you press PTT to begin transmission
- you receive encrypted audio from another station

The time required depends on the length of time the called station takes to tune the antenna, typically 12 to 15 seconds.

To set the duration of secure standby after a call in a Codan Selcall HF network:

- From the main menu, select (**Settings**), then (**Security**).
- Press ▲ or ▼ to scroll to the **Standby After Selcall** entry.



- Press ◀ or ▶ to select the value that you want to set, or enter the number directly.
- Press (**Save**) to save the information.
- Press (**Close**).

Related links:

Logging in to admin level on page 146
Standby After Selcall on page 372
Enabling access to secure standby on page 454

Base key

The CES-128 voice encryptor uses a Base secure key in secure index 0. This key, along with the selected secure key in a Corporate secure index, is used as the seed for the encryption algorithm. The Base secure key may be changed using a CICS command (`secure key` #0 *`key`*) or via the control point. Changing the Base secure key changes the seed for the encryption algorithm. Transceivers must use the same Base secure key and secure key in a Corporate secure index for successful secure communication.

NOTE: The Base secure key is combined with a secure key in a Corporate secure index for use in the encryption algorithm. The Global secure key is not used as a seed for the Corporate encryption algorithm.

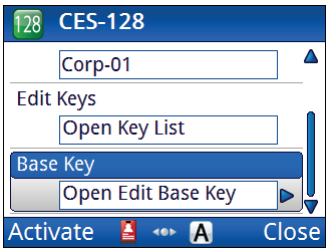
Related links:

Logging in to admin level on page 146

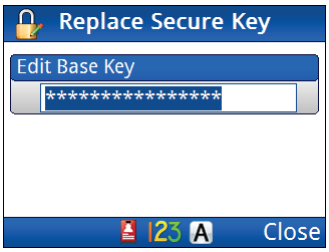
Changing the base key

To change the base key:

- If you are using a 2220 Handset or 2230 Desk Console, do *one* of the following:
  - From the main menu, select (**General**), then (**Secure**).
  - *Hold* SEC.
- If you are using a 2221 Handset:
  - From the main menu, select (**Functions**).
  - Press ▲ or ▼ to scroll to the **Secure Info** entry.
  - Press (**Select**).
- Press ▲ or ▼ to scroll to the **Base Key** entry.



- Press ▶.



- Enter up to 16 digits for the base key.
- Press (**Save**) to save the information.
- Press (**Close**).

AES-256 encryption

Related links:

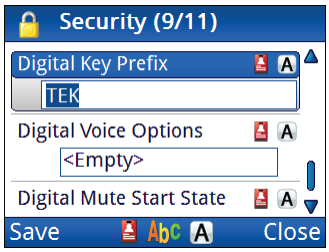
AES-256 encryption for digital voice on page 460
AES-256 data encryption on page 461

Setting the digital key prefix

A secure key is contained within a secure index. This index has a name that is used to identify it. The name comprises a prefix followed by a sequential number. The digital key prefix applies to all digital voice and data encryptors used with the transceiver. The default digital key prefix is TEK.

To set the digital key prefix:

- From the main menu, select (**Settings**), then (**Security**).
- Press ▲ or ▼ to scroll to the **Digital Key Prefix** entry.



- Enter the prefix that you want to use.

  You may enter up to 4 alphanumeric characters.
- Press (**Save**) to save the information.
- Press (**Close**).

Related links:

Logging in to admin level on page 146
Digital Key Prefix on page 374

AES-256 encryption for digital voice

NOTE: A DV option with the AES-256 Encryption upgrade may be used in conjunction with the AES-256 data encryptor and CIVS and/or the CES-128 voice encryptor (from firmware V1.08 or later).

NOTE: The AES-256 DV Encryptor may be used in conjunction with the AES-256 data encryptor and CIVS.

NOTE: VCOM is used to provide virtual COM ports for programming secure keys via KMS/KFS over the USB connector on the control point.

The DV options with the AES-256 Encryption upgrade and the AES-256 DV Encryptor are optional features that provide high-grade security for voice communications. These features use secure keys to provide secure communications. The digital voice rate sets the speed with which digital voice transmissions are sent. The digital voice rate is shown in status area 1 of the screen. Use the lowest digital voice rate in the first instance, then if good HF propagation conditions exist, a higher rate may be selected.

The display on the handset clearly indicates whether the transceiver is secure or clear.

NOTE: You can change the prefix for the AES secure keys in **Settings** > **Security** > **Digital Key Prefix**, using KMS, or via CICS.

Figure 94: Channel screen showing secure/clear status for all encrypted digital voice

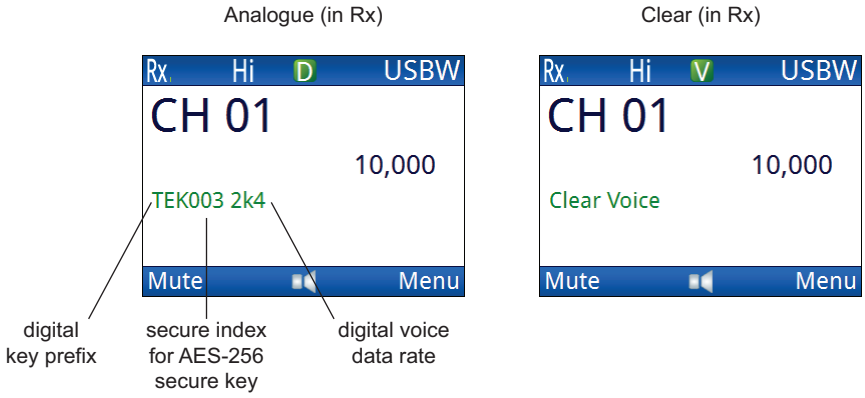
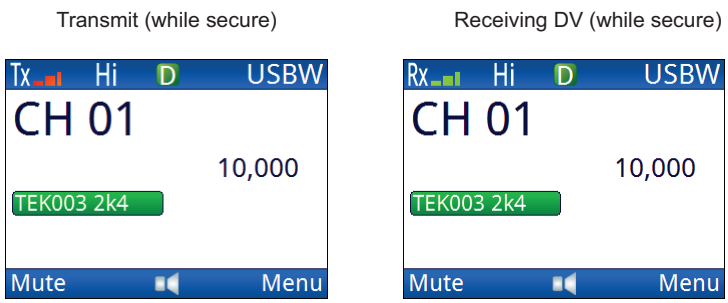


Figure 95: Channel screen showing transmit/receive status for all encrypted digital voice



NOTE: When transmitting via a DV option, listen for the Tx ready beep after you have released PTT before you *hold* PTT again.

CAUTION: When transmitting with the AES-256 DV Encryptor, you should *hold* PTT, wait 2 sec, speak, wait 2 sec, then release PTT.

The DV options with the AES-256 Encryption upgrade and the AES-256 DV Encryptor can use a key in secure index 0. This key may be programmed at any time, by any user. This key cannot be programmed by KMS. If all of the secure keys have been erased, the user can enter a new key into secure index 0 for immediate secure communications.

NOTE: This key must be the same across all transceivers that communicate securely.

Related links:

Digital Key Prefix on page 374
Switching the secure feature on or off on page 428
Overview of digital voice options on page 388
Digital voice rate on page 389
Using encryption on page 428

AES-256 data encryption

NOTE: To use AES-256 data encryption, you must have MIL/STANAG 2G Data fitted in the transceiver, and MIL/STANAG 2G Data option and AES-256 Encryption upgrade enabled in your transceiver's firmware. You may also use an RM50e HF Data Modem installed in your transceiver system and selected as a peripheral device.

NOTE: AES-256 data encryption may be used in conjunction with AES-256 digital voice encryption, CES-128 voice encryption, or CIVS.

NOTE: Codan's KMS may also be used to generate secure keys and to fill the AES-256 data encryptor. If you are programming secure keys for the AES-256 data encryptor only (that is, without digital voice), you must restart the transceiver after programming the keys.

NOTE: When KMS/KFS is used to program secure keys for AES-256 data encryptor, the transceiver must not be connected through 08-06952-00x (USB A to GP port serial) or 08-07318-00x (USB A to 6-way serial) cables.

NOTE: VCOM is used to provide virtual COM ports for programming secure keys via KMS/KFS over the USB connector on the control point.

The internal MIL/STANAG 2G Data or external RM50e HF Data Modem is an optional feature that provides data communications with high-grade AES-256 digital encryption. It must be used in conjunction with the RC50-C HF Email software. The data modem is capable of high-speed data transfer at speeds of up to 9600 bit/s using STANAG 4539 waveforms. The data modem also supports MIL-STD-188-110A/B (including Appendix F), STANAG 4285, STANAG 4529, and STANAG 4415 waveforms.

The AES-256 data encryptor uses secure keys to provide secure communications. The display on the handset clearly indicates whether the transceiver is secure (**TEK*index***) or clear (**Clear Data**).

NOTE: You can change the prefix for the AES secure keys in **Settings** > **Security** > **Digital Key Prefix**, using KMS, or via CICS.

Figure 96: Channel screen showing secure/clear status for AES-256 data encryption

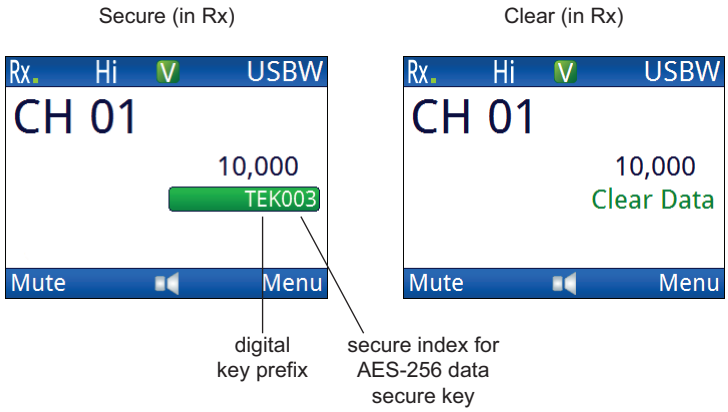
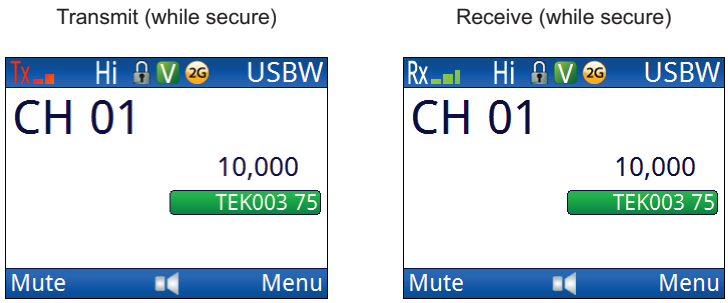


Figure 97: Channel screen showing transmit/receive status for AES-256 data encryption



The AES-256 data encryptor can use a key in secure index 0. This key may be programmed at any time, by any operator. This key cannot be programmed by KMS. If all of the secure keys have been erased, the operator can enter a new key into index 0 for immediate secure communications.

NOTE: For more information on setting up and using RC50-C with your email application, please see the documentation provided on the RC50-C HF Email software CD.

NOTE: For information on connecting the transceiver with MIL/STANAG 2G Data to your computer, please see the related link below.

NOTE: For information on connecting the transceiver, RM50e HF Data Modem and computer, please see the *RM50e HF Data Modem Operator Guide*.

Related links:

MIL/STANAG 2G Data on page 412
RM50e HF Data Modem on page 419
Switching the secure feature on or off on page 428
Viewing the COM port setting in VCOM on page 407

Using AES-256 data encryption

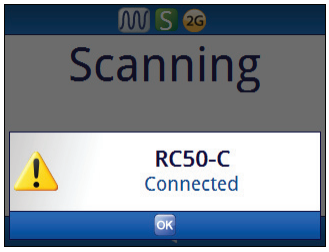
The MIL/STANAG 2G Data or RM50e stores the secure keys, provides the secure encryption and decryption, and provides data encoding and decoding. The transceiver provides the interface to the encryptor and control of key selection and secure status. An email message is sent via your email client to the RC50-C HF email software, which passes it to the encryptor. The encryptor passes the message to the transceiver, which transmits it over the air.

NOTE: VCOM is used to provide virtual COM ports for programming secure keys via KMS/KFS over the USB connector on the control point.

To use AES-256 data encryption:

- Launch the RC50-C HF Email software, then click **Go Online** to activate the encrypted modem.

  The transceiver responds with a beep.

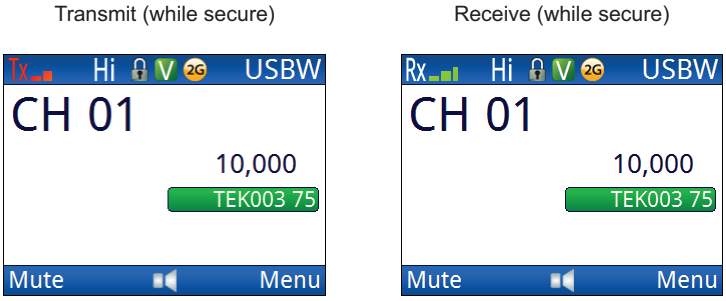


- If you are using a 2220 Handset or 2230 Desk Console, press SEC.
- If you are using a 2221 Handset:
  - Press (**Options**).
  - Press ▲ or ▼ to scroll to the **Secure On** option.
  - Press (**Select**).
- Compose your email message in your email client software, for example Microsoft® Outlook®, then send it to the recipient.

  When a digitally encrypted signal is transferred between the data modems across the link established by the transceivers, the index is highlighted. The current transmit or receive data rate is indicated on the right-hand side of the secure index.

  While the message is being sent between the transceivers, activity is reported on the screen of the control point.

Figure 98: Transmit and receive screens during an AES-256 data call



If the email station is not in secure mode when a signal is transferred between the data modems, **TEK*index*** is replaced by **Clear Data**.

Related links:

Switching the secure feature on or off on page 428
Viewing the COM port setting in VCOM on page 407

DVP-200

This section contains the following topics:

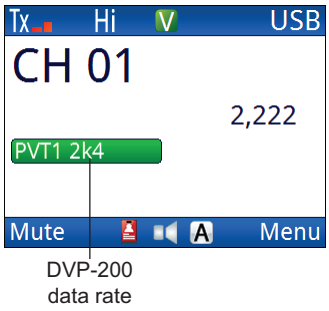
Overview of DVP-200

A DVP-200 unit can be connected to the RFU GP port to provide digital voice functionality, similar to the other digital voice options. You can select from 8 private keys pre-programmed into the unit, or generate a public key at run-time.

DVP-200 rate

The DVP-200 rate sets the speed at which DVP-200 data is transmitted over the air. The digital voice rate is shown in status area 1 of the screen. Use the lowest digital voice rate in the first instance, then if good HF propagation conditions exist, a higher rate may be selected. The available rates are 1200 and 2400 bit/s.

Figure 99: Channel screen showing the DVP-200 rate



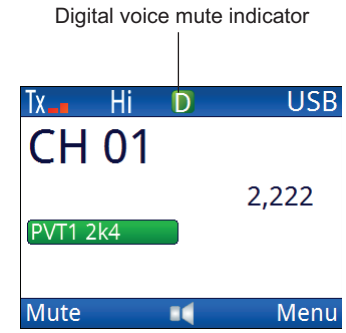
Related links:

Selecting the DVP-200 rate on page 467

Digital voice mute with DVP-200

When DVP-200 is active, you have the option of selecting voice mute (**V**), selcall mute (**S**), or digital voice mute (**D**). Digital voice mute enables only secure digital voice to be processed through to the user when scanning is switched off or paused. Voice mute enables all clear and secure voice detected at your station to be heard by the user, and selcall mute blocks all signals except for calls specifically addressed to your station.

Figure 100: Digital voice mute indicator



DVP-200 encrypted digital voice (in Tx)

Related links:

Selecting digital voice mute with DVP-200 on page 468

Using DVP-200

Switching the DVP-200 feature on or off

To switch the digital voice feature on or off:

- If you are using a 2220 Handset or 2230 Desk Console, press SEC
- If you are using a 2221 Handset:
  - Press (**Options**).
  - Press ▲ or ▼ to scroll to the **Secure On** | **Secure Off** option.
  - Press (**Select**).

  DVP-200 digital voice is toggled on or off.

  NOTE: DVP-200 digital voice can also be toggled on or off from the front panel of the DVP-200 unit.

NOTE: The DVP-200 clear digital mode is not supported when used with an Envoy transceiver. It is not possible to put the DVP-200 in clear digital mode using the handset or desk console. If this mode is selected from the front panel of the DVP-200 unit, the Envoy transceiver will revert to clear analogue mode.

Figure 101: Channel screen showing on/off status for DVP-200

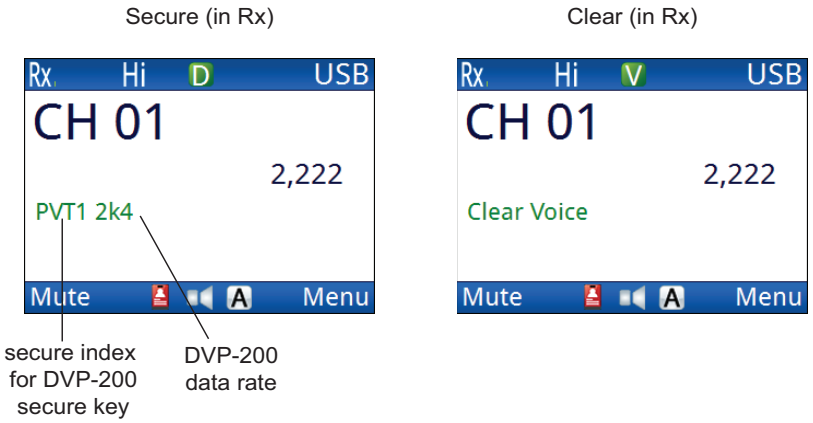
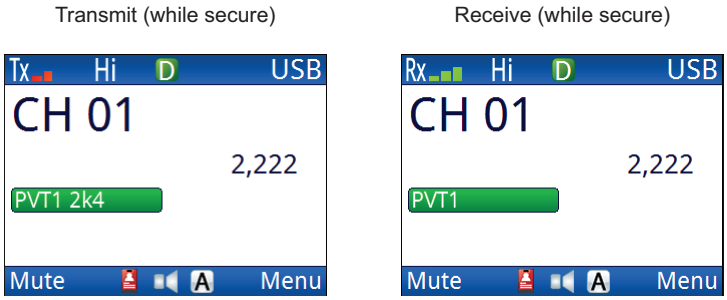


Figure 102: Channel screen showing transmit/receive status for DVP-200



Selecting the DVP-200 rate

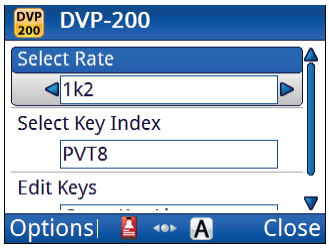
The DVP-200 rate sets the speed at which DVP-200 data is transmitted over the air. The DVP-200 rate is shown in status area 1 of the screen. Use the lowest rate in the first instance, then if good HF propagation conditions exist, a higher rate may be selected. The available rates are 1200 and 2400 bit/s.

NOTE: Receiving DVP-200 stations automatically switch to the appropriate rate when a signal is detected.

NOTE: The DVP-200 rate can also be selected from the front panel of the DVP-200 unit.

To select a different DVP-200 rate:

- If you are using a 2220 Handset or 2230 Desk Console, do *one* of the following:
  - From the main menu, select (**General**), then (**Secure**).
  - *Hold* SEC.
- If you are using a 2221 Handset:
  - From the main menu, select (**Functions**).
  - Press ▲ or ▼ to scroll to the **Secure Info** function.
  - Press (**Select**).



- Press ◀ or ▶ to select the digital voice rate that you want to use.
- Press (**OK**).

Related links:

DVP-200 rate on page 465

Selecting digital voice mute with DVP-200

NOTE: Digital voice mute is available when DVP-200 is active, and scanning is switched off or paused.

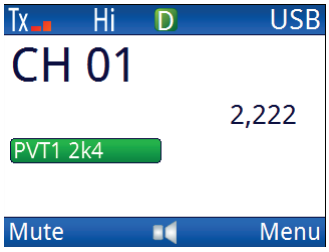
NOTE: If you want to suppress any noise burst on a connected or built-in loudspeaker during an operational event (for example, changing a channel or mode) select the **Muted unless digital voice** check box in **Settings** > **Security** > **Digital Voice Options**.

To select digital voice mute with DVP-200:

- Switch off scanning.
- If you are using a 2220 Handset or 2230 Desk Console, press SEC, then press V/S until **D** is shown in the centre of the status bar on the channel screen.

- If you are using a 2221 Handset:
  - Press (**Options**).
  - Press ▲ or ▼ to scroll to the **Secure On** option.
  - Press (**Select**).
  - Press (**Options**).
  - Press ▲ or ▼ to scroll to the **V/S/D** option.
  - Press (**Select**).
  - Repeat these steps until **D** is shown in the centre of the status bar on the channel screen.

DVP-200 encrypted digital voice (in Tx)

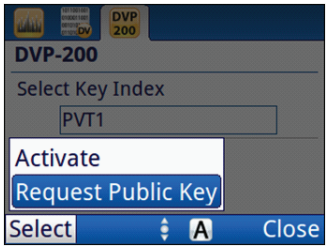


Performing DVP-200 public key exchange over the air

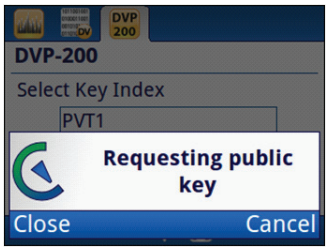
A DVP-200 public key exchange can be performed between two DVP-200 units.

To initiate a public key exchange:

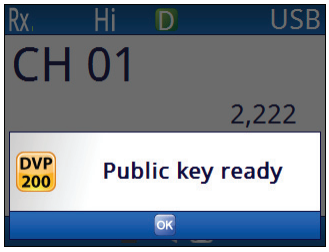
- If you are using a 2220 Handset or 2230 Desk Console, do *one* of the following
  - From the main menu, select (**General**), then (**Secure**).
  - *Hold* SEC
- If you are using a 2221 Handset:
  - From the main menu, select (**Function**).
  - Press ▲ or ▼ to scroll to the **Secure Info** function.
  - Press (**Select**)
- Press ▲ or ▼ to scroll to the **Request Public Key** function.



- Press (**Select**)

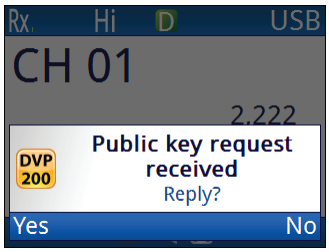


An indication will be shown upon successful public key exchange:



NOTE: A public key exchange can also be initiated from the DVP-200 front panel.

To accept or reject a DVP-200 public key exchange initiated from another DVP-200 unit, simply select **Yes** or **No** when the request popup appears:



NOTE: A DVP-200 public key request can also be accepted or rejected from the DVP-200 front panel.

Figure 103: Channel screen showing status following a successful DVP-200 public key exchange

Indication of DVP-200 public key.
The last letter "P" indicates public key.

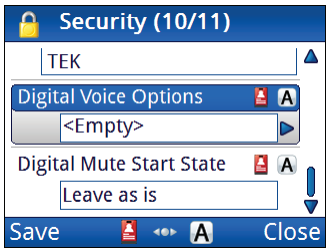
Setting up DVP-200

Locking the DVP-200 rate

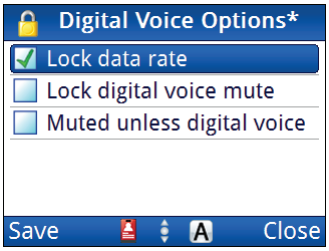
The data rate for DVP-200 can be locked so that the user cannot change it. You must select the rate that you want to use before locking it.

To lock the DVP-200 rate:

- Select the DVP-200 rate that you want to use.
- From the main menu,select (**Settings**), then (**Security**).
- Press ▲ or ▼ to scroll to the **Digital Voice Options** entry.



- Press ▶.
- Ensure that the **Lock data rate** value is highlighted.
- Press (**Select**) to select the check box.



When the check box is selected, the item is enabled. When the check box is clear, the item is disabled.

- Press (**Save**) to save the information.
- Press (**Close**).

Related links:

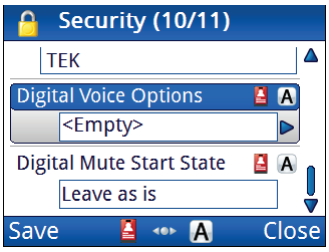
Selecting the DVP-200 rate on page 467

Suppressing analogue noise bursts with DVP-200

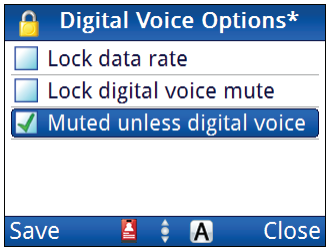
Normal operational events, such as changing a channel or mode, cause mute to switched off temporarily.

To suppress a noise burst unless digital voice is present:

- From the main menu,select (**Settings**), then (**Security**).
- Press or to scroll to the **Digital Voice Options** entry.



- Press .
- Ensure that the **Muted unless digital voice** value is highlighted.
- Press (**Select**) to select the check box.



When the check box is selected, the item is enabled. When the check box is clear, the item is disabled.

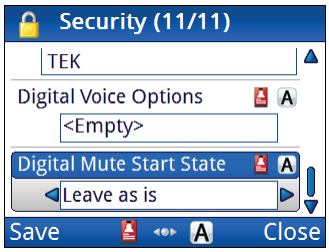
- Press (**Save**) to save the information.
- Press (**Close**).

Setting the start state of digital voice mute with DVP-200

You can set the initial state that digital voice mute uses when you go secure with AES-256 digital voice encryption.

To set the start state of digital voice mute:

- From the main menu,select (**Settings**), then (**Security**).
- Press or to scroll to the **Digital Mute Start State** entry.



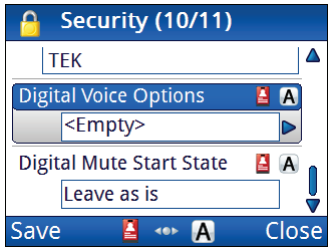
- Press or to select the valuethat you want to usefrom the following:
  - If you want digital mute to be on when you enter secure mode, select **Mute on**.
  - If you want digital mute to be off when you enter secure mode, select **Mute off**.
  - If you want digital mute to be in the same state as when secure mode was last used, select **Leave as is**.

- Press (**Save**) to save the information.
- Press (**Close**).

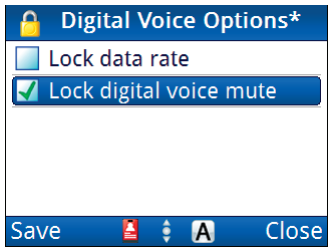
Locking the state of digital voice mute with DVP-200

To lock the state of digital voice mute:

- Select the digital voice mute statethat you want to use.
- From the main menu,select (**Settings**), then (**Security**).
- Press or to scroll to the **Digital Voice Options** entry.



- Press .
- Press or to scroll to the **Lock digital voice mute** value.
- Press (**Select**) to select the check box.



When the check box is selected, the item is enabled. When the check box is clear, the item is disabled.

- Press (**Save**) to save the information.
- Press (**Close**).

22 Free tune

This section contains the following topics:

Overview of free tune

The transceiver can be used as a free-tune receiver. This enables you to tune to any frequency within the transceiver's operating range of 250 kHz to 30 MHz.

In some circumstances, the options installed in your transceiver may enable you to transmit while free tuning, for example, the Amateur Mode option enables you to transmit during free tune when tuned to a frequency in the amateur band.

Table 22: Amateur Band frequencies

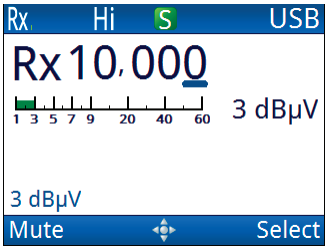
Frequency (MHz)
1.8 to 2.0
3.5 to 4.0
5.06 to 5.45
7.0 to 7.3
10.1 to 10.15
14.0 to 14.35
18.0 to 18.2
21.0 to 21.45
24.8 to 25.0
28.0 to 29.7

Selecting a free-tune frequency

The free-tune function in the transceiver provides the ability to scroll up and down through the frequency range to tune to the frequency that you want, or enter the exact frequency on which you want to tune.

To select a free-tune frequency:

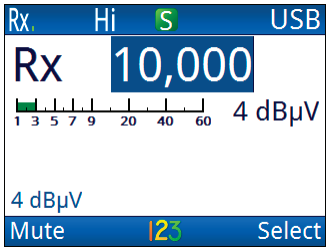
- Go to the channel screen.
- If the transceiver is scanning, press **SCAN** to switch off scanning.
- If you are using a 2220 Handset or 2230 Desk Console, press FREE Rx.
- If you are using a 2221 Handset:
  - Press (**Options**).
  - Press ▲ or ▼ to scroll to the **Free Tune Screen** function.
  - Press (**Select**).
- If you want to listen for traffic on the frequency, ensure that mute is switched off.
- Do *one* of the following:
  - If you want to scroll to a free-tune frequency that is accurate to a fraction of a kilohertz (up to 3 decimal points), use ◀, ▶, ▲ or ▼ to scroll to the frequency.



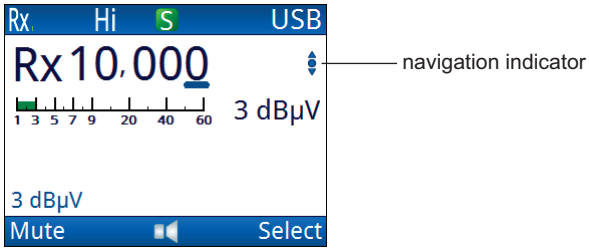
NOTE: You cannot change the volume of the signal that you are receiving.

  - If you want to enter a free-tune frequency, press (**Select**) until the existing frequency is highlighted, then use the numeric keys to enter the frequency that you want to use, up to 2 decimal places.

NOTE: If you are using a 2221 Handset, press **OK** to access the virtual keypad.



- If you want to scroll to a free-tune frequency, and be able to adjust the volume as required, press (**Select**) until the navigation indicator appears next to the frequency, then use ▲ or ▼ to scroll to the frequency.



NOTE: You cannot scroll to a frequency that is a fraction of a kilohertz.

- If you are using a 2220 Handset or 2230 Desk Console, press FREE Rx to exit free tune.
- If you are using a 2221 Handset, press (**Options**), scroll to **Channels**, then press (**Select**).

Related links:

Switching mute on or off on page 39
Adding a channel in free tune on page 479
Entering text with the 2221 Handset on page 155

Adding a channel in free tune

If you want to be able to return to a frequency to which you have free tuned quickly, you may add the frequency as a channel.

NOTE: If you are operating the transceiver in a country that has stringent licensing regulations, you may not be permitted to add channels with transmit frequencies.

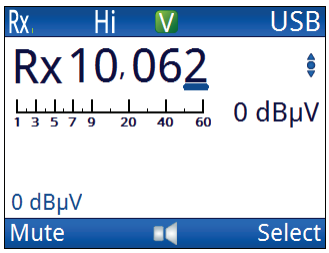
NOTE: If the TxD option is installed in the transceiver, there are restrictions on the frequencies that you can enter.

NOTE: If the TxP option is installed in the transceiver, you cannot add channels.

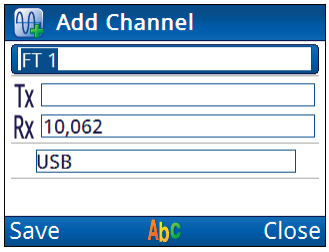
NOTE: If the channel list is locked at admin level, you cannot add channels at user level.

To add a channel in free tune:

- If you are using a 2220 Handset or 2230 Desk Console, press FREE Rx.
- If you are using a 2221 Handset:
  - Press (**Options**).
  - Press ▲ or ▼ to scroll to the **Free Tune Screen** function.
  - Press (**Select**).
- Tune to the frequency that you want to use.



- *Hold* **OK**.



- Enter the name that you want to use for the channel.
- Press ▼ to move to the**Rx** entry.

- Edit the receive frequency (in kHz) that you want to use for this channel.

  NOTE: You can define the frequency to 1 Hz.

- Press (**Save**) to save the information.

Related links:

Selecting a free-tune frequency on page 477
Entering text with the 2221 Handset on page 155

23 IP remote control

This section contains the following topics:

Related links:

IP specifications on page 527

Direct Ethernet connection

A direct Ethernet connection may be used in the following situations:

- The distance between the desk console and the RFU exceeds the maximum allowable length (> 30 m) of the direct 8-way to 10-way cable (08-07205-030).

  CAUTION: Long RF cable runs between the RFU and antenna can be used, but cable losses degrade the signal. RF cable runs should be separated from Ethernet cable runs.

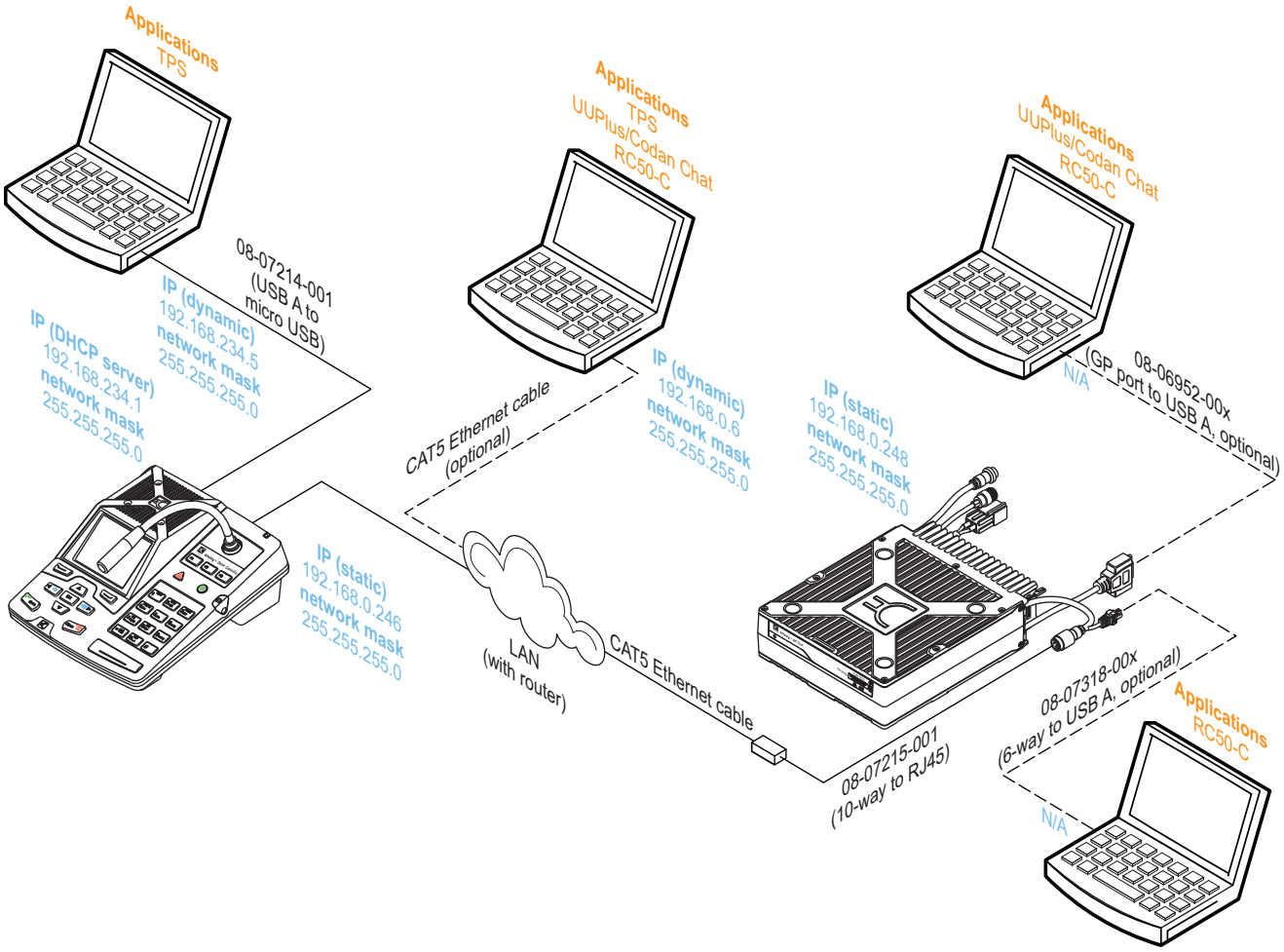
- CAT5 Ethernet cable is already available between the required sites for the desk console and RFU.

  If the Ethernet cable is in situ, it may be cheaper and easier to use this cable when compared with the cost of running a dedicated direct 8-way to 10-way interface cable (08-07205-030).

  CAUTION: The maximum continuous length of CAT5 Ethernet cable is approximately 100 m.

This connection uses the transceiver to Ethernet adaptor cable (08-07215-001).

Figure 104: Direct Ethernet connection



NOTE: IP settings are examples only.

CAUTION: If the desk console is connected to the RFU via an Ethernet cable and cable 08-07215-001, ensure that cable 08-07205-00x is not connected to the 8-way connector (⚷) on the rear of the desk console.

NOTE: You can connect a PC via a CAT5 Ethernet cable into a LAN (with router) using the same subnet mask as the equipment to which you want to connect.

LAN connection

A LAN connection may be used in the following situations:

- The transceiver system, with multiple RFUs, is located at one site where a LAN infrastructure and network access points are available.

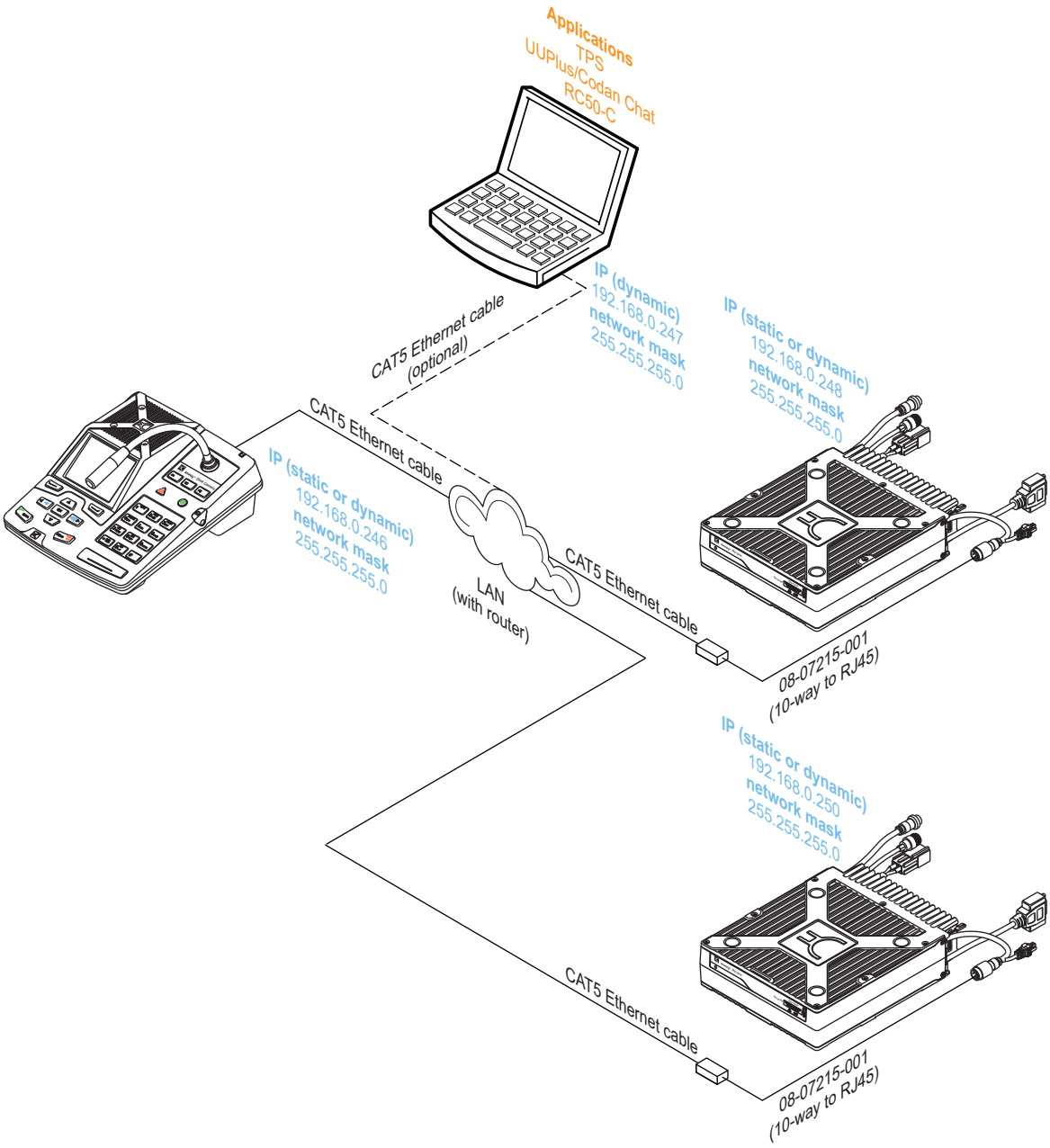
  This installation may be used in multi-storey buildings that are pre-wired for LAN communications.

- The distance between the desk console and the RFU(s) exceeds the maximum allowable length (> 30 m) of the direct 8-way to 10-way cable (08-07205-030).

  CAUTION: Long RF cable runs between the RFU and antenna can be used, but cable losses degrade the signal. RF cable runs should be separated from Ethernet cable runs.

This connection uses the transceiver to Ethernet adaptor cable (08-07215-001).

Figure 105: LAN connection



NOTE: IP settings are examples only.

CAUTION: If the desk console is connected to the RFU via an Ethernet cable and cable 08-07215-001, ensure that cable 08-07205-00x is not connected to the 8-way connector (⏚) on the rear of the desk console.

NOTE: You can connect a PC via a CAT5 Ethernet cable into a LAN (with router) using the same subnet mask as the equipment to which you want to connect.

Point-to-point WAN connection

A point-to-point WAN connection may be used if the operator is in a different geographic location from the antenna installation where the RFU is co-located, and these locations are beyond the reach of standard cabling and LAN access. There are two ways to achieve a point-to-point WAN connection:

- Using VPN.
- Using the port forwarding function in the routers.

LANs are included in the diagrams to indicate the routers that are needed to connect each system. This effectively creates a LAN environment.

This connection uses the transceiver to Ethernet adaptor cable (08-07215-001).

Figure 106: Point-to-point WAN connection using VPN

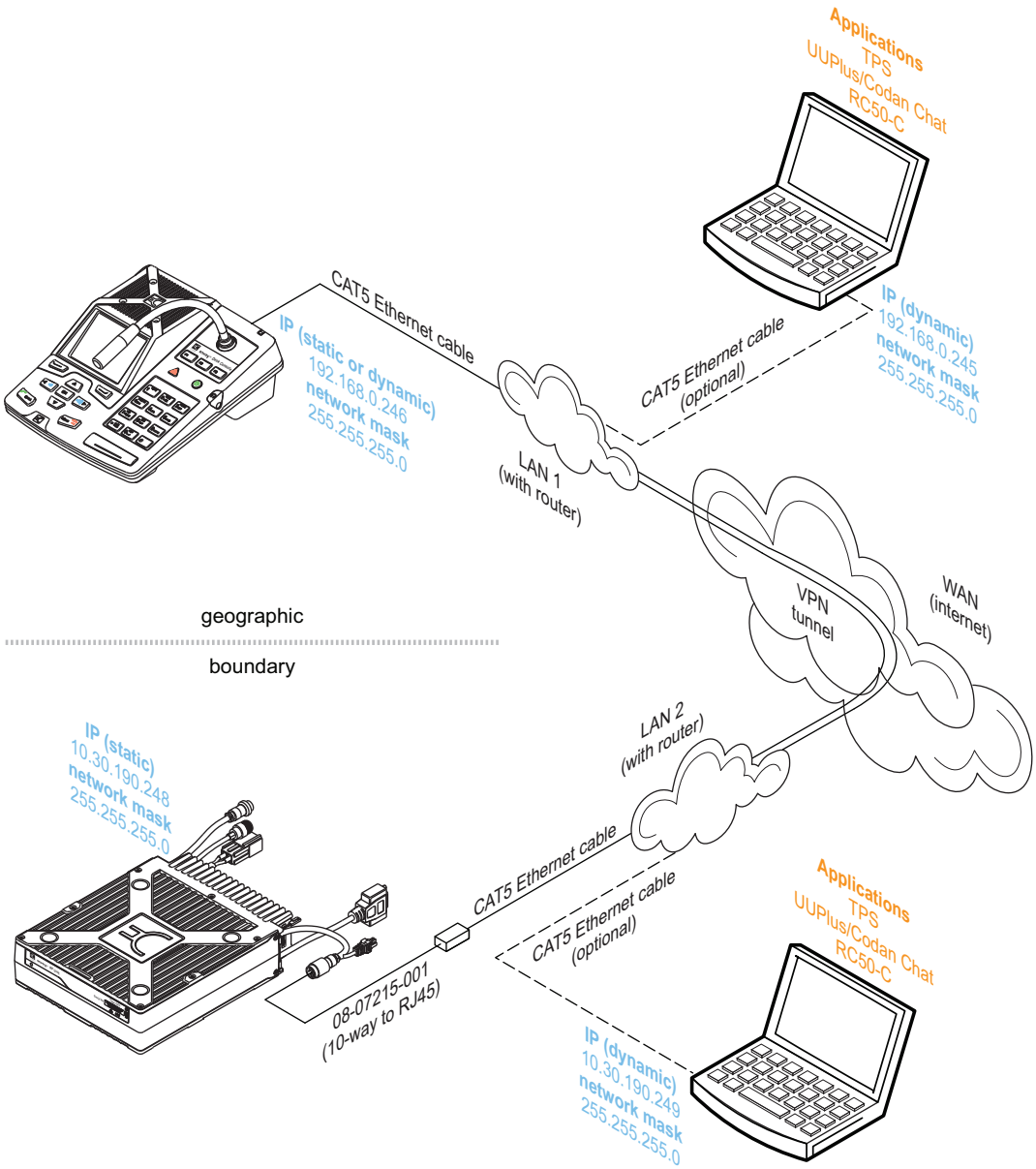
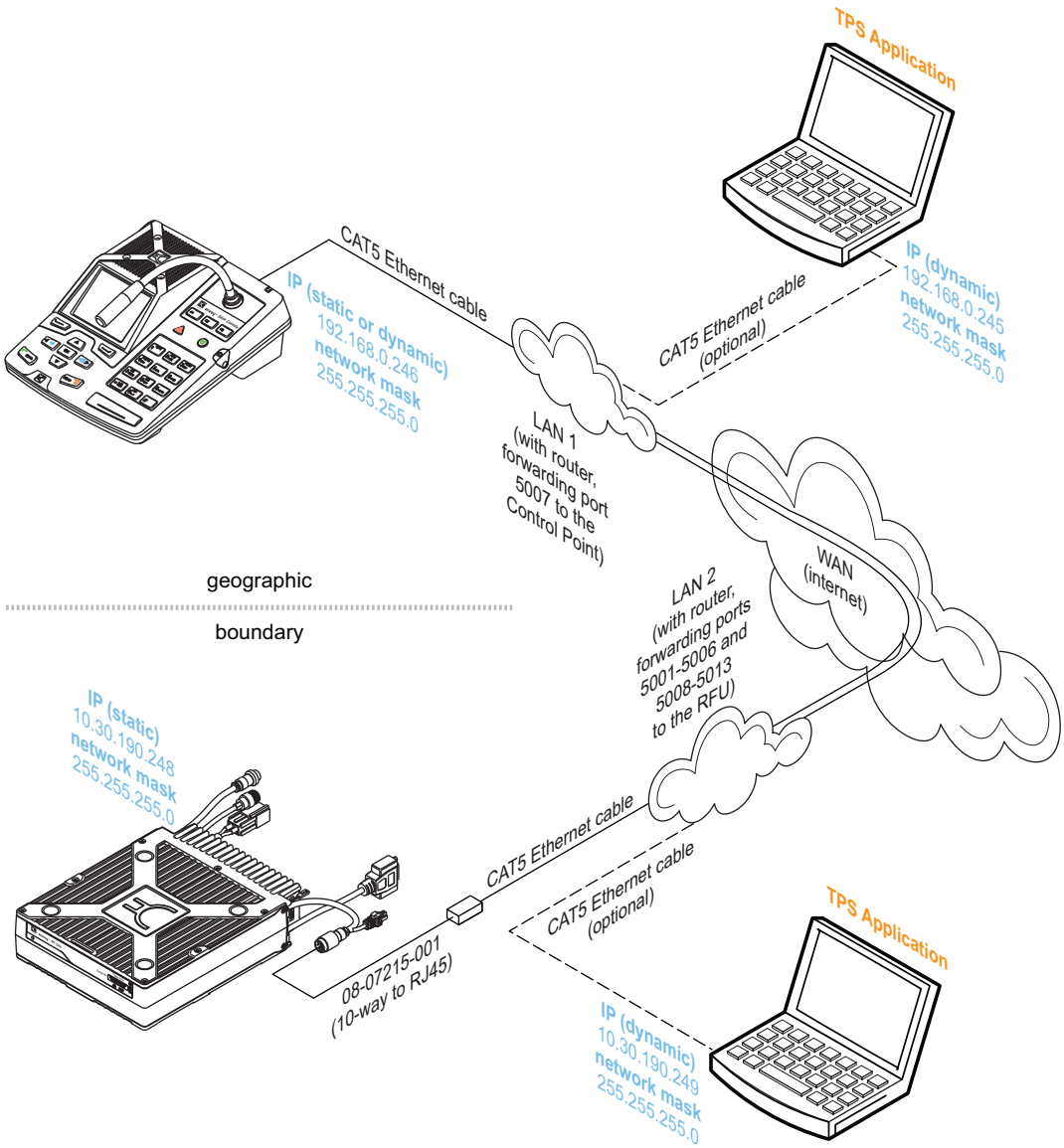


Figure 107: Point-to-point WAN connection using port forwarding



NOTE: IP settings are examples only.

CAUTION: If the desk console is connected to the RFU via an Ethernet cable and cable 08-07215-001, ensure that cable 08-07205-00x is not connected to the 8-way connector ( ) on the rear of the desk console.

NOTE: You can connect a PC via a CAT5 Ethernet cable into a LAN (with router) using the same subnet mask as the equipment to which you want to connect.

24 Multiple control points

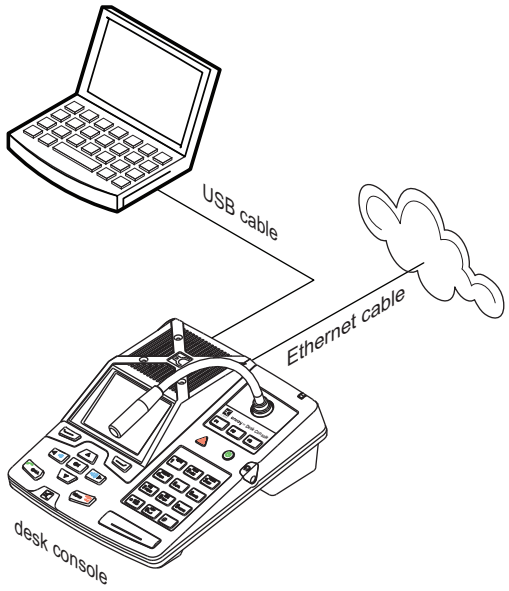
This section contains the following topics:

Overview of multiple control points

Multiple control points for an Envoy transceiver system may comprise up to four control point nodes that may be connected to an Ethernet switch or Envoy SmartLink, depending on the available connectors. These alternatives are represented by the cloud in the diagrams below. Possible node layouts are shown in Figure 108 and Figure 109. The system layout shown in Figure 110 uses an Ethernet switch. System layouts that use an Envoy SmartLink are discussed in the *2240 Envoy SmartLink™ Reference Manual* (Codan part number 15-04168-EN).

The single connection between the nodes and the RFU must have capacity for the number of nodes connected. The upload/download capacity required for one node is 256 kbit/s minimum or 512 kbit/s recommended, so for two nodes, the required capacity is twice this, and so on, up to a maximum of four nodes.

Figure 108: Computer connected via USB to control point



NOTE: A desk console that is connected via Ethernet cabling to the RFU requires a separate power supply.

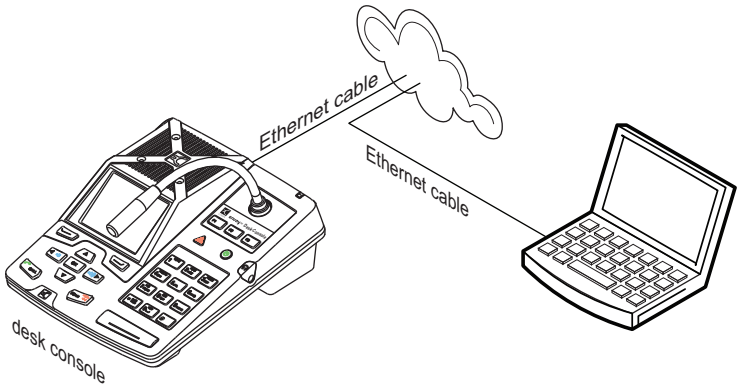
NOTE: The upload/download capacity required for one node is 256 kbit/s minimum or 512 kbit/s recommended.

The following applications may be used on the computer connected to a control point via USB:

- TPS System Programmer
- KMS/KFS/RC50-C/UUPlus/Codan Chat/CICS via VCOM

If the computer connected via USB is removed, a USB storage device may be used to read or program a profile, upgrade the firmware of the transceiver or the RM50 module, or fill secure keys.

Figure 109: Computer and control point connected to Ethernet switch



NOTE: A desk console that is connected via Ethernet cabling to the RFU requires a separate power supply.

NOTE: The upload/download capacity required for one node is 256 kbit/s minimum or 512 kbit/s recommended.

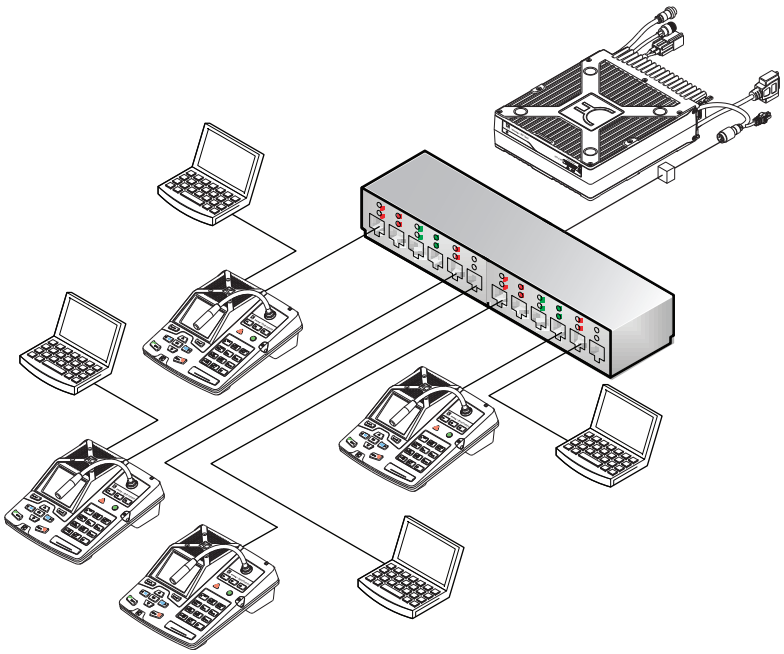
The following applications may be used on the computer connected to a control point via an Ethernet switch:

- TPS System Programmer
- KMS/KFS/RC50-C/UUPlus/Codan Chat via VCOM

NOTE: Only one application connected via VCOM may be serviced by the RFU at a time.

A USB storage device may be connected to the control point to read or program a profile, upgrade the firmware of the transceiver or the RM50 modem, or fill secure keys.

Figure 110: Example of multiple control points connected to an Ethernet switch



NOTE: A desk console that is connected via Ethernet cabling to the RFU requires a separate power supply.

NOTE: The upload/download capacity required for the connection to the RFU is the sum of the upload/download of each connected node, in this case, 4 × 256 kbit/s minimum or 4 × 512 kbit/s recommended.

Related links:

Registering a self address on page 494
Making a call when multiple control points are connected to the same RFU on page 53
Setting the power-down function of a control point on page 47
Control Point IP Address on page 377
Power-down Function on page 311
The channel screen on page 27
Using VCOM services on page 135
Restrictions on peripheral use on page 256

Calling

In a system that uses multiple control points, calling, mute, and display behaviours are determined by whether or not you have control of a call. If your control point has the same self address registered as the control point that initiated or received a call, you will also have control over this call and can view the progress of the call on the screen. If your control point has a different self address registered, you will not have control over this call unless you are able to override it. Your ability to override a call lock is set in **Settings** > **Calling** > **General** > **Calling Lock Override**. You may need to switch off mute and change the mute type if you want to listen to the received signals.

As it may not be possible to know what each control point in a multiple control point system is doing at any one time, the status of the RFU is displayed on the screen if it is busy. If a modem application is connected, an icon appears in the status bar of the channel screen. If the RFU is busy being upgraded or programmed by another control point, a lock icon appears in the status bar of the channel screen and you are informed when the operation is completed. Your ability to override a system lock is set in **Settings** > **Configuration** > **General** > **System Lock Override**.

Related links:

Making a call when multiple control points are connected to the same RFU on page 53
Receiving a call on page 79
The channel screen on page 27
Calling Lock Override on page 349
System Lock Override on page 333

Registering a self address

If there are two or more self addresses programmed for an HF network, you should select one of these for use by your control point for making and receiving calls. The control point detects the self address status when it is initially connected, and may prompt you to register one of the available self addresses, if required. If you are prompted to register a self address, it is similar to the process set out below, however, you will be guided through each step. If you want to register or change the self address for your control point, follow the process below.

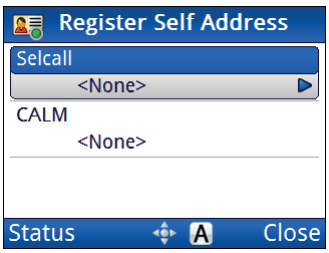
NOTE: A control point must have a registered self address for the HF network in order to send and receive calls via the HF network.

NOTE: As part of this registration process, if the control point still has its default alias of **CP**, you are prompted to personalise this for your control point. The alias of each connected control point is shown in the Register Self Address screen, and also in **Information** > **Control Points**.

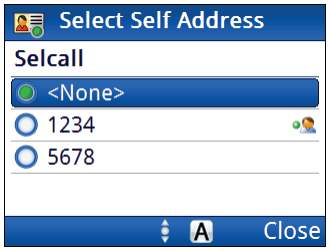
To register a self address for your control point:

- From the main menu, select (**General**), then (**Register Self Address**).
- If you are prompted to personalise the alias for your control point, and you are able to access admin level, do *one* of the following:
  - Press (**Yes**), enter a suitable name that identifies your control point to other users, then press (**Save**).
  - Press (**No**).

  A list of HF networks that have two or more available self addresses is shown. The currently registered self address for an HF network, or **None**, is shown below the name of the HF network.



- If you want to view the other control points that have a self address registered for a particular HF network:
  - Press ▲ or ▼ to scroll to the HF network, then press (**Status**).
  - Press ▲ or ▼ to scroll through the list of connected control points and any self address that may be registered for that HF network.
  - If you want to view the IP address, the type, the ESN, and MAC address for a selected control point, press (**Status**), then press (**Close**).
  - Press (**Close**).
- Press ▲ or ▼ to scroll to the HF network for which you want to register a self address, then press ▶.



- Press ▲ or ▼ to scroll to the self address that you want to use for this control point in this HF network, then press (**Register**).

  NOTE: A self address that has been registered by another control point is indicated by the icon at the end of the line. A self address may be selected by multiple control points, if required.

  NOTE: If you do not want to make or receive calls via this HF network, select **None**, then press (**Deregister**).
- Repeat this process for other HF networks, if required.
- Press (**Close**).

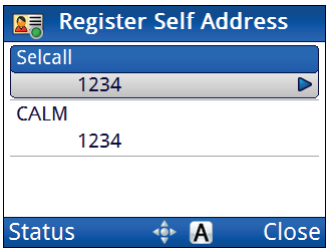
Related links:

Switching between basic and advanced views on page 144
Additional self addresses on page 198
Deregistering a self address on page 496
Deleting additional self addresses on page 205
Changing the alias of a control point on page 497
Viewing information for connected control points on page 499

Deregistering a self address

To deregister a self address:

- From the main menu, select (**General**), then (**Register Self Address**).



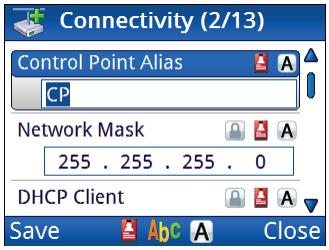
- Press ▲ or ▼ to scroll to the HF network in which you want to deregister a self address.
- Press ▶.
- Press ▲ or ▼ to scroll to **<None>**, then press (**Deregister**).
- Press (**Close**).

Changing the alias of a control point

An alias is a text string that is used to identify a device in a system. When multiple devices of the same type are connected, it is useful to give each device a personalised name.

To change the alias of a control point:

- From the main menu, select (**Settings**), then (**Connectivity**).
- Press ▲ or ▼ to scroll to the **Control Point Alias** entry.



- Enter the personalised name that you want to use for this control point.
- Press (**Save**) to save the information.

Changing the IP address of a control point

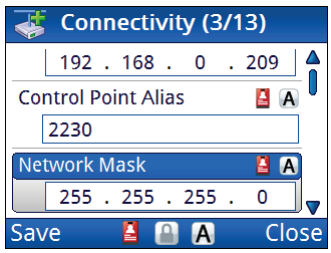
Multiple control points that are connected via the same Ethernet switch must have the same network mask. If the **Network Mask** entry is set to 255.255.255.0, then the first three octets of the IP address must be the same. For example, with this network mask you may use IP addresses similar to 192.168.0.207, 192.168.0.208, and 192.168.0.209.

Each control point may have its IP address automatically assigned by a DHCP server by setting the **Settings** > **Connectivity** > **DHCP Client** entry to **Enabled**. The IP address of the RFU should remain static.

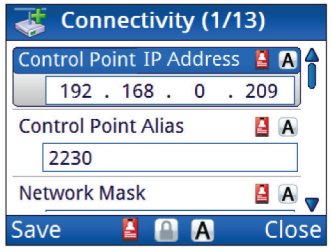
CAUTION: You must activate the DHCP server in your network before setting up each control point to receive an IP address from the server.

To change the IP address of a control point:

- From the main menu, select (**Settings**), then (**Connectivity**).
- Press ▲ or ▼ to scroll to the **Network Mask** entry.



- Enter the network mask that you want to set for your IP addresses.
- Press ▲ or ▼ to scroll to the **Control Point IP Address** entry.



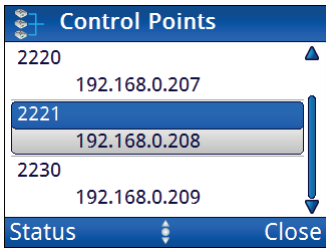
- Enter the IP address that you want to use for this control point.
- Press (**Save**) to save the information.

Viewing information for connected control points

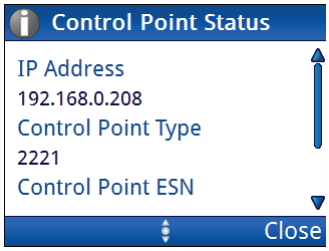
You can view the IP address, the type, the ESN, and MAC address for each control point connected in your system. The control points are listed by their alias.

To view information for a connected control point:

- From the main menu, select (**Information**), then (**Control Points**).



- Press ▲ or ▼ to scroll to the control point for which you want to view the information, then press (**Status**).



- Press (**Close**).

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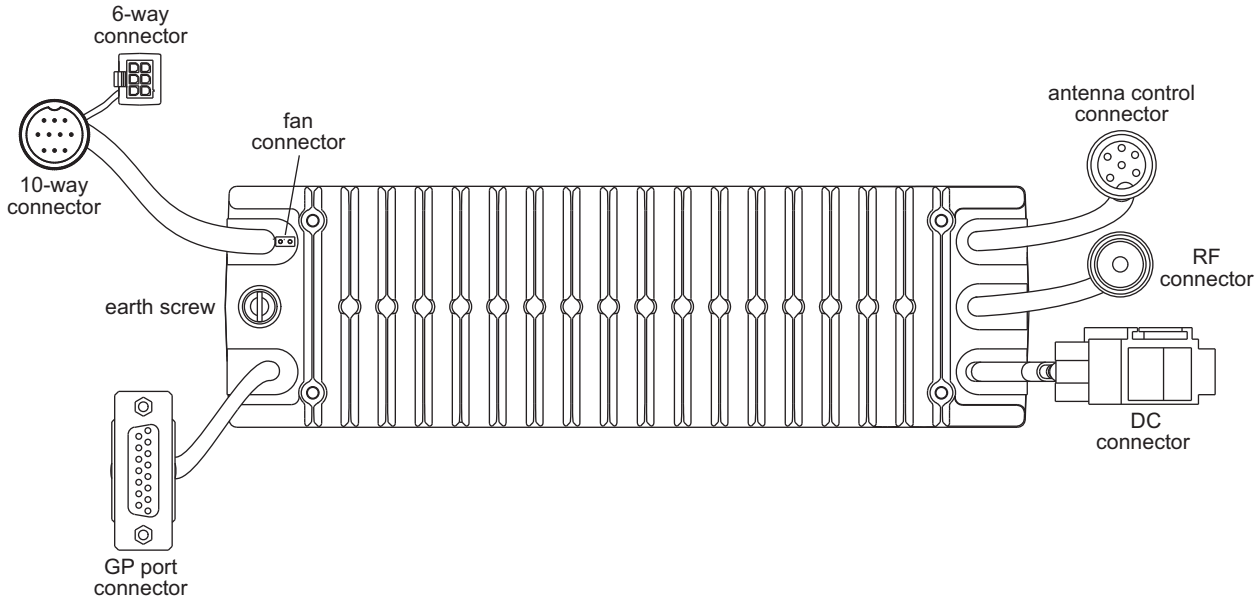
25 Connectors

This section contains the following topics:

Connectors on the RFU

Figure 111: Back panel of the 2210 RFU



NOTE: The 6-way connector is attached to the rear of the 10-way connector.

Related links:

Antenna control connector on page 502
DC supply connector on page 503
RF connector on page 504
Fan connector on page 504
10-way connector on page 504
6-way serial data connector on page 505
Handset and speaker connector on page 506
GP port connector on page 507

Antenna control connector

The antenna control connector is on a flying lead located on the right side of the back panel. The antenna control connector is used to connect to an automatic tuning antenna. It supplies power to the antenna and transmits control signals to and from the antenna.

Figure 112: Front view of the antenna control connector

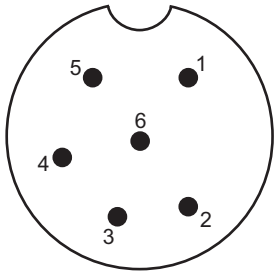


Table 23: Pinouts of the antenna control connector

Pin no.	Function	Input/output	Signal level
1	Tune in/out (Data)	Input/output	5 V logic, active low
2	Scan	Output	12 V logic, active low
3	Tuned in (Data)	Input	5 V logic
4	**A** rail protected (1 A in combination with 6-way connector)	Output	+13.8 V nominal
5	External ALC input	Input	Control at 3.4 V
6	Ground		0 V

DC supply connector

The DC supply connector is on a flying lead located on the right side of the back panel. The DC supply connector is used to power the transceiver system and ancillary products.

Table 24: Pinouts of the DC supply connector

Pin	Function
+	+13.8 V nominal (10.8 V DC to 16 V DC)
–	Ground (0 V)

RF connector

The RF connector is on a flying lead located on the right side of the back panel. It is used to connect to an antenna.

Fan connector

The fan connector is on a flying lead located at the top left of the back panel. The fan connector is used when additional cooling is required for the heatsink, for example, for continuous data communication.

Figure 113: Front view of the fan connector

Table 25: Pinouts of the fan connector

Pin	Function
–	0 V (when fan is activated)
+	+13.8 V nominal

10-way connector

The 10-way connector is on a flying lead located on the top left side of the back panel. It connects to either the handset and speaker cable (Codan part number 08-06022-001), or to the 2230 Desk Console via cable 08-07205-xxx or 08-07215-001.

Figure 114: Front view of the 10-way connector

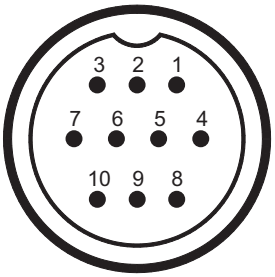


Table 26: Pinouts of the 10-way connector

Pin no.	Function	Input/output	Signal level
1	Speaker audio +	Output	Approx. 12 V p–p at onset of clipping
2	Speaker audio –	Output	0 V
3	Ethernet data Tx–	Output	10Base-T/100Base-Tx
4	Ethernet data Tx+	Output	10Base-T/100Base-Tx
5	Ethernet data Rx–	Input	10Base-T/100Base-Tx
6	Ethernet data Rx+	Input	10Base-T/100Base-Tx
7	N/C		
8	Standby/power/PWR ON for handset	Output	+4.8 V standby power, or +12 V handset power Momentary 120 Ω to 0 V = PWR ON
9	**A** rail protected (2 A nominal)	Output	+13.8 V nominal
10	Ground		0 V

Related links:

Setting the power-down function of a control point on page 47

6-way serial data connector

The 6-way connector is on a flying lead from the back of the 10-way connector.

The serial data (RS232) connector can be used for connecting peripheral devices to the transceiver. By default, it is set up for a GPS receiver.

Figure 115: Front view of the 6-way connector

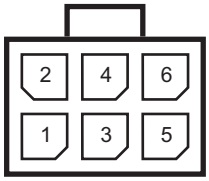


Table 27: Pinouts of the 6-way connector

Pin no.	Function	Input/output	Signal level
1	**A** rail protected (1 A in combination with antenna control connector)	Output	+13.8 V nominal
2	Ground		0 V
3	RS232 Tx data A	Output	RS232
4	RS232 Rx data A	Input	RS232
5	5 V	Output	+5 V
6	RS232, 1 pulse per sec	Input	RS232

Related links:

Overview of peripherals on page 234

Handset and speaker connector

The handset and speaker connector is part of the control cable (Codan part number 08-06022-001) that connects to the 10-way connector on the RFU. This cable is not used with 2230 Desk Console.

NOTE: This connector is compatible with all handsets.

Figure 116: Front view of the handset and speaker connector

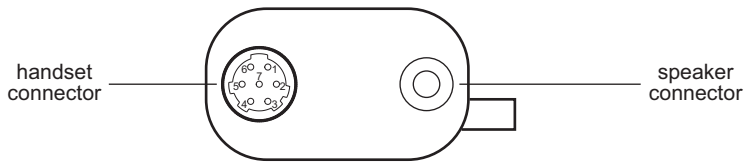


Table 28: Pinouts of the handset connector

Pin no.	Function	Input/output	Signal level
1	Standby/power/PWR ON for handset	Input	+4.8 V standby power, or +12 V handset power Momentary 120 Ω to 0 V = PWR ON
2	Ethernet data	Input	Ethernet logic levels
3	Ethernet data	Input	Ethernet logic levels

Table 28: Pinouts of the handset connector (cont.)

Pin no.	Function	Input/output	Signal level
4	Ground		0 V
5	Ethernet data	Output	Ethernet logic levels
6	Ethernet data	Output	Ethernet logic levels
7	Handset audio (Mk 2 handset only when used with enabled accessories, volume setting dependent), otherwise N/C	Output	Analogue

The speaker should be 4 Ω or greater, with a power rating of 5 W.

Table 29: Pinouts of the speaker connector

Connection	Function
Tip	Speaker audio output
Sleeve	Ground

GP port connector

The GPIO connector is on a flying lead located on the left side of the back panel. It is used to interface to a variety of third-party products such as morse keys, GPS units etc.

Figure 117: Front view of the GP port connector

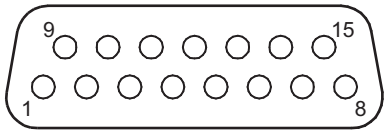


Table 30: Pinouts of the GP port connector

Pin no.	Function	Input/output	Signal level
1	RTS (Audio 2 out)	Output	RS232
2	RS232 Rx data	Input	RS232
3	RS232 Tx data	Output	RS232

Table 30: Pinouts of the GP port connector (cont.)

Pin no.	Function	Input/output	Signal level
4	Ground		0 V
5	Tx audio (5 kΩ balanced)	Input	300 mV p–p ALC threshold
6	External alarm relay contact (Audio 2 out) (NO or NC depending on jumper P402)	Output	Contacts rated 50 V, 1 A
7	External alarm relay common, or 600 Ω balanced audio	Output	Contacts rated 50 V, 1 A, or 600 Ω audio
8	**A** rail protected (1 A maximum)	Output	+13.8 V nominal
9	CTS (Audio 2 In)	Input	RS232
10	PTT	Input	5 V TTL logic active low
11	Morse (PTT out)	Input	5 V TTL logic active low
12	Busy (Mute out) (Private out)	Output	5 V logic
13	Quiet (Q) line (Audio 2 In)	Input	5 V TTL logic active high when **Data** selected 5 V TTL logic active low when all other devices selected
14	System audio unbalanced, or 600 Ω balanced audio	Output	600 Ω audio 1 V p–p, or 600 Ω balanced audio
15	Tx audio (5 kΩ balanced)	Input	300 mV p–p ALC threshold

NOTE: External alarm relay is an internal link that may select normally open or normally closed. It can be configured to switch to ground or the **A** rail.

NOTE: The 600 Ω output option is selected by internal links.

NOTE: The second audio function requires an additional audio PCB to be fitted.

Related links:

Overview of peripherals on page 234
Morse input on page 509
PTT on page 509
Q line on page 509
Relay contact on page 509
Serial data on page 510
System power (A rail protected) on page 510
Tx audio input on page 510
System audio output on page 510

Morse input

When a ground is detected on the morse input, the transceiver generates a morse tone on air. This functionality is typically provided with a morse key.

PTT

This function puts the transceiver into transmit mode and enables the audio transmit path via the GP port connector (pins 5 and 15).

Q line

The Q line switches the transceiver between data and voice modes, and stops the transceiver from scanning. When a modem is connected, settings are chosen that are suitable for data transmission.

Related links:

Serial data on page 510

Relay contact

The relay can be wired by a user to ring a bell or to sound a car horn. If a Selective call is received, the bell or horn sounds for 2 minutes. If it is an Emergency call, it toggles on and off three times per second, continuing for 5 minutes.

The relay contacts are capable of switching up to 1 A. An additional external relay must be used to switch high current loads such as bells, car horns, or lights.

The contact can be configured via internal links to do one of the following in the case of an alarm:

- join pins 6 and 7 together (normal, not available when 600 Ω balanced audio output is used), or
- switch pin 6 to ground, or
- switch pin 6 to battery volts (**A** rail)

NOTE: The external alarm is not activated under certain values of **Settings** > **Calling** > **Alert Tones**.

Related links:

Alert Tones on page 343

Serial data

The serial data (RS232) connector can be used for controlling and monitoring the transceiver, programming the transceiver settings, and sending and receiving message calls.

The serial data connector can be used for connecting peripheral devices to the transceiver.

Related links:

Overview of peripherals on page 234

System power (A rail protected)

System power is switched off when the transceiver is switched off.

WARNING: The total load connected to the **A** rail protected supply must not exceed 2 A.

Tx audio input

Audio input from external equipment, for example, data modems, is connected between pins 5 and 15 and is a balanced floating input. The input signal should be nominally 1 V p–p and not exceed 3 V p–p.

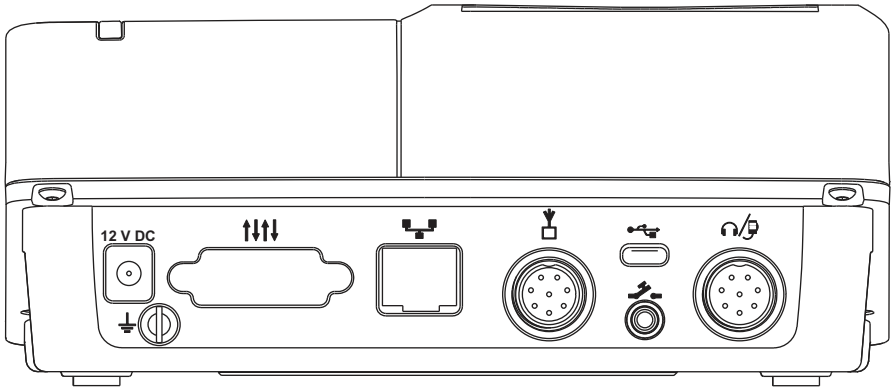
System audio output

This supplies Rx audio at a default level of –13 dBm.

System audio output is normally unbalanced and connected to pin 14. The transceiver can also be internally reconfigured to provide balanced 600 Ω audio output from pins 14 and 7. In this mode, the relay contacts can only be used by switching pin 6 to either ground or the battery volts.

Connectors on the desk console

Figure 118: Back panel of the 2230 Desk Console



Related links:

DC supply connector on page 511
GP port connector on page 511
Ethernet connector on page 513
Transceiver connector on page 513
USB connector on page 514
Foot-switched PTT connector on page 514
8-way connector on page 515
Headphone connector on page 516

DC supply connector

12 V DC

The DC supply connector is on the back panel of the desk console. It is used with a 12 V DC power supply to provide power to the desk console when it is connected via Ethernet to the RFU.

Table 31: Pinouts of the DC supply connector

Connection	Function
Pin	+12 V
Sleeve	0 V

GP port connector

The GP port connector is on the back panel of the desk console. It is used to interface to a variety of third-party products.

Figure 119: Front view of the GP port connector

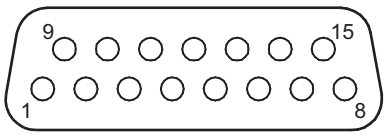


Table 32: Pinouts of the GP port connector

Pin no.	Function	Input/output	Signal level
1	RTS	Output	RS232
2	RS232 Rx data	Input	RS232
3	RS232 Tx data	Output	RS232
4	Ground		0 V
5	Tx audio (5 kΩ balanced)	Input	300 mV p–p ALC threshold
6	External alarm relay contact (NO or NC depending on jumper P701)	Output	Contacts rated 50 V, 1 A
7	External alarm relay common, or 600 Ω balanced audio (future use)	Output	Contacts rated 50 V, 1 A, or 600 Ω audio
8	**A** rail protected (1 A maximum)	Output	+13.8 V nominal
9	CTS	Input	RS232
10	PTT	Input	5 V TTL logic active low
11	Morse (PTT out)	Input	5 V TTL logic active low
12	Busy (Mute out) (Private out)	Output	5 V logic

Table 32: Pinouts of the GP port connector (cont.)

Pin no.	Function	Input/output	Signal level
13	Quiet (Q) line	Input	5 V TTL logic active high when **Data** selected 5 V TTL logic active low when all other devices selected
14	System audio unbalanced, or 600 Ω balanced audio (future use)	Output	600 Ω audio 1 V p–p, or 600 Ω balanced audio
15	Tx audio (5 kΩ balanced)	Input	300 mV p–p ALC threshold

NOTE: External alarm relay is an internal link that may select normally open or normally closed. It can be configured to switch to ground or the **A** rail.

Ethernet connector

The Ethernet connector is on the back panel of the desk console. It is a standard RJ45 socket.

CAUTION: If the desk console is connected to the RFU via an Ethernet cable and cable 08-07215-001, ensure that cable 08-07205-00x is not connected to the 8-way connector () on the rear of the desk console.

Transceiver connector

The Transceiver connector is on the back panel of the desk console. It transfers control signals between the RFU and the desk console, and provides power from the RFU to the desk console.

CAUTION: If the desk console is connected to the RFU via cable 08-07205-00x, ensure that an Ethernet cable is not connected to the RJ45 connector on the rear of the desk console.

Figure 120: Front view of the Transceiver connector

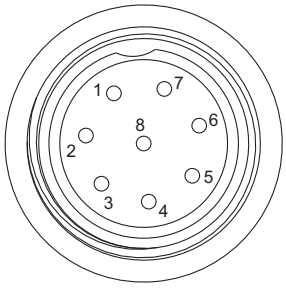


Table 33: Pinouts of the Transceiver connector

Pin no.	Function	Input/output	Signal level
1	Ground	Output	0 V
2	Ethernet Rx–	Input	10Base-T/100Base-Tx
3	Ethernet Rx+	Input	10Base-T/100Base-Tx
4	Shield		
5	Ethernet Tx–	Output	10Base-T/100Base-Tx
6	Ethernet Tx+	Output	10Base-T/100Base-Tx
7	Power supply for console	Input	+4.8 V standby power, or +12 V console power Momentary 120 Ω to 0 V = PWR ON
8	**A** rail protected (future use)	Output	+12 V nom (10.8 V to 16 V)

USB connector

The USB connector is on the back panel of the desk console. It is a standard micro AB USB receptacle. It accepts either a micro A or micro B plug and supports USB on-the-go.

Foot-switched PTT connector

The Foot-switched PTT connector is on the back panel of the desk console. It is a 3.5 mm (1/8 in) jack.

Table 34: Pinouts of the Foot-switched PTT connector

Connection	Function	Input/output	Signal level
Sleeve	Do not connect		
Tip	PTT (+)	Input	Active low, pull-up to 5 V
Ring	Return (–)		Ground

8-way connector

The 8-way connector is on the back panel of the desk console. It is used to interface to an external foot-switched PTT, headset, microphone, or morse key.

Figure 121: Front view of the 8-way connector

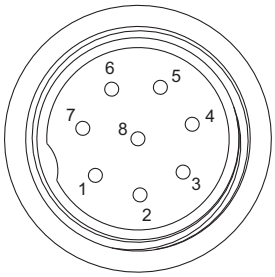


Table 35: Pinouts of the 8-way connector

Pin no.	Function	Input/output	Signal level
1	Ground		0 V
2	External microphone	Input	To suit electret microphone
3	Bias for Electret	Output	+5 V via 3k2 resistor
4	PTT	Input	Active low, pull-up to 3.3 V
5	External earpiece	Output	20 mW max into 16 Ω
6	Ground		0 V
7	+5 V supply	Output	+5 V, 100 mA max

Table 35: Pinouts of the 8-way connector (cont.)

Pin no.	Function	Input/output	Signal level
8	External morse key	Input	Active low, pull-up to 3.3 V

Headphone connector

The headphone connector is on the right-hand side of the desk console. It is a 3.5 mm (1/8 in) stereo jack.

Table 36: Pinouts for the headphone connector

Connection	Function	Signal level
Ring	Audio (right)	10 mW max into 32 Ω
Tip	Audio (left)	10 mW max into 32 Ω
Sleeve	Ground	0 V

26 Specifications

This section contains the following topics:

NOTE: Specifications are subject to change without notice or obligation.

General specifications

Where relevant, typical values are given in brackets [ ]. All measurements are made at 13.8 V DC, with 50 Ω source and load resistances at 25°C (77°F) ambient temperature, unless otherwise specified.

Table 37: General specifications

Item	Specification
Frequency range	Transmit: 1.6 MHz to 30 MHz Receive: 0.25 MHz to 30 MHz
Channel capacity (single or two-frequency simplex channels)	X1: 100 (International) 400 (Australia) X2: 1 000
Frequency generation	All frequencies generated by synthesiser and DDS with 1 Hz resolution
Operating modes	Single sideband (J3E) USB and LSB or switched USB/LSB, AM (A3E Rx, H3E Tx), CW/LMCW/UMCW (J1A, A1A)
Frequency stability	±0.5 ppm [±0.3 ppm] –30°C to +60°C (–22°F to 140°F)
Programming	Frequencies and options are programmed via the USB connector on the control point usingTPS System Programmerand a computer, via a pre-programmed USB storage device, or via a special Ethernet cable to the RFU Channels may be entered from the handset by qualified personnel or (where authorised) by the user
Transmit/Receive switching	< 25 ms via GP port on RFU
RF input/output impedance	50 Ω nominal
Supply voltage	13.8 V DC nominal, negative earth Nominal operating range: 10.8 V to 15 V Functional range: 9 V to 16 V (not specified) Reverse polarity protected

Table 37: General specifications (cont.)

Item	Specification
Overvoltage protection	Shut down at 16 V DC nominal for duration of overvoltage
Supply current	Transmit: see transmit specifications Receive: no signal < 0.5 A typical, 0.6 A maximum
Finish colour	Black

Related links:

Transmit specifications on page 520

Transmit specifications

Table 38: Transmit specifications

Item	Specification	
Power outputfor AUST & FCC	100 W PEP ±0.5 dB, 27 MHz CB 10 W PEP (Aust only)	
Power output	125 W PEP reducing with frequency to 100 W PEP at 30 MHz ±1 dB CW or single tone: approximately 60% of PEP with average PEP control (average control disabled on handset PTT)	
Duty cycle	100%:	normal speech over full temperature range
	100%:	ARQ up to 30°C (86°F)
	25%:	16-tone continuous data mode (5 minutes on maximum) at ambient temperature up to 30°C (86°F)
	100%:	all modes up to maximum ambient temperature of 45°C (113°F) with Option F
Supply current	Output power:	100 W or 125 W
	Two-tone or CW:	9 A to 18 A [12.5 A]
	Average speech:	8 A for battery life calculations
Protection	Safe under all load conditions by limiting reflected power to 10 W PEP and limiting PA FET drain voltage swing Thermal protection against excessive heatsink temperature	
A/F response	Overall response of microphone and transmitter rises approximately 6 dB/octave 300 to 2 700 Hz	
Spurious and harmonic emissions	Better than 64 dB [69] dB below PEP	
Carrier suppression	60 dB [65 dB] below PEP	
Unwanted sideband	65 dB [70 dB] below PEP	

Table 38: Transmit specifications (cont.)

Item	Specification	
Intermodulation (Two-tone test)	100 W and 125 W:	27 dB [34 dB] below each tone 33 dB [40 dB] below PEP
ALC	A 10 dB increase in signal input above compression threshold produces less than 0.5 dB increase in power output Maximum ALC range greater than 30 dB ALC attack time approximately 1 ms	
Microphone	Electret Condenser type	
Differential group delay	Less than 100 µs [75 µs]	300 Hz to 3 050 Hz Measured at GPIO connector

Receive specifications

Table 39: Receive specifications

Item	Specification
Type	Software-defined radio Superheterodyne/IF sampling DSP
IF frequency	45 MHz
Sensitivity	Frequency: 0.25 MHz to 30 MHz — RF amp off: 0.5 µV PD [0.4 µV PD] –113 dBm [–115 dBm] Frequency: 1.6 MHz to 30 MHz — RF amp on: 0.2 µV PD [0.12 µV PD] –121 dBm [–125 dBm] For 10 dB SINAD with greater than 50 mW audio output
Input protection	Will withstand 50 V p–p RF from a 50 Ω source
Selectivity	Greater than 65 [70] dB at –1 kHz and +4 kHz reference SCF USB 2 400 Hz filter: –6 dB [–4 dB] 300 to 2 700 Hz 2 750 Hz filter: –3 dB [–2 dB] 300 to 3 050 Hz 3 000 Hz filter: –3 dB [–2 dB] 300 to 3 300 Hz
Desensitisation	10 dB SINAD reduced to 7 dB SINAD (2 400 Hz filter) −1 kHz and +4 kHz (ref SCF): 60 dB [65 dB] ±10 kHz: 75 dB [80 dB] ±50 kHz: 95 dB [100 dB]
Blocking	As for Desensitisation For frequencies > ±50 kHz > 95 dB [100 dB]
Image rejection	Better than 90 dB [95 dB]

Table 39: Receive specifications (cont.)

Item	Specification
Spurious responses	Better than 80 dB [85 dB] Self-generated signals > 0.15 µV PD: 20 MHz
Intermodulation	Measured in accordance with AS/NZS 4770 with unwanted tone frequencies +30 kHz and +58 kHz, and –30 kHz and –62 kHz relative to the SCF With a wanted signal of –69 dBm (RF amp off) and –83 dBm (RF amp on), the unwanted signal must be greater than –7.7 dBm [–4.3 dBm] (RF amp off) and –23 dBm [–17.7 dBm] (RF amp on) to reduce the SINAD to 20 dB Third-order intercept (unaffected by AGC): +33 dBm [+38 dBm] with RF amp off +17 dBm [+25 dBm] with RF amp on
AGC	Less than 3 dB variation in output for input variation between 1.0 µV [0.5 µV] and 100 mV PD (RF amp on) Fast attack, slow release (selectable release time)
A/F response @ loudspeaker	Typic –6 dB 300 to 2 500 Hz al:
A/F power and A/F distortion	2.4 W into 8 Ω, 5% THD 4 W into 4 Ω, 5% THD 4 W into 2 Ω, 5% THD
Clarifier	±10 ppm (nominal) ±50 Hz below 5 MHz, increasing to ±300 Hz at 30 MHz Clarifier is automatically reset to mid-frequency with channel change
In-band IMD	Better than 25 dB IMD with two 100 mV EMF RF inputs
Signal to noise vsinput signal	An increase of input level of 40 dB above the sensitivity level increases the signal to noise ratio to at least 40 dB
Differential group delay	Less than 100 µs [40 µs] 300 Hz to 3 050 Hz Measured at GPIO connector
IF rejection	> 95 dB [105 dB]

Table 39: Receive specifications (cont.)

Item	Specification
Mute (squelch)	Syllabic Operates on the loudspeaker audio Can be defeated

Environmental specifications

Table 40: Environmental specifications

Item	Specification
Environment	Ambient temperature: −30°C to +60°C (–22°F to 140°F) Relative humidity: 95% Derate upper ambient temperature by 1°C (1.8°F) per 330 m (360 yd) above sea level
Cooling	Convection or fan (Option F)

Mechanical specifications

Table 41: Mechanical specifications

Item	Specification	
Size	2210 RFU:	210 mm W × 270 mm D × 65 mm H (8.4 in W × 10.8 in D × 2.6 in H)
	2220/2221 Handset:	74 mm W × 32 mm D × 150 mm H (2.9 in W × 1.3 in D × 5.9 in H)
	2230 Desk Console:	190 mm W × 233 mm D × 81 mm H (7.5 in W × 9.2 in D × 3.2 in H)
	Handset and speaker connector:	42 mm W × 55 mm D × 22 mm H (1.7 in W × 2.2 in D × 0.9 in H)
Weight	2210 RFU:	2.8 kg (6.2 lb)
	2220/2221 Handset:	0.3 kg (0.7 lb)
	2230 Desk Console:	1.1 kg (2.4 lb)
	Handset and speaker connector:	0.4 kg (0.9 lb)
Sealing	All units:	IP43

IP specifications

Table 42: IP specifications

Item	Specification		
Bandwidth	Upload/Download (per control point):		256 kbit/sec, min 512 kbit/sec, recommended
Ping time	100 ms, preferred 500 ms, max		
Ports	UDP	5003	Auto-detection of RFU on the local network
	TCP	5001, 5002	Profile-related operations and firmware upgrades
	TCP	5004, 5005	RFU control
	UDP	5006	RFU audio streams
	UDP	5007	Control Point audio streams
	TCP	5008	UI Audio beeps
	TCP	5009	Console GP Port Virtual CICS
	TCP	5010, 5011, 5012, 5013	Tx audio stream
	TCP	6000	VCOM Port for 2.4 kbps Internal Modem Interface
	TCP	6001	VCOM port for CICS Session
	TCP	6002	VCOM Port for MIL/STANAG 2G Data Interface
	TCP	6003	VCOM Port for GPS Plotter

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A Installation

This section contains the following topics:

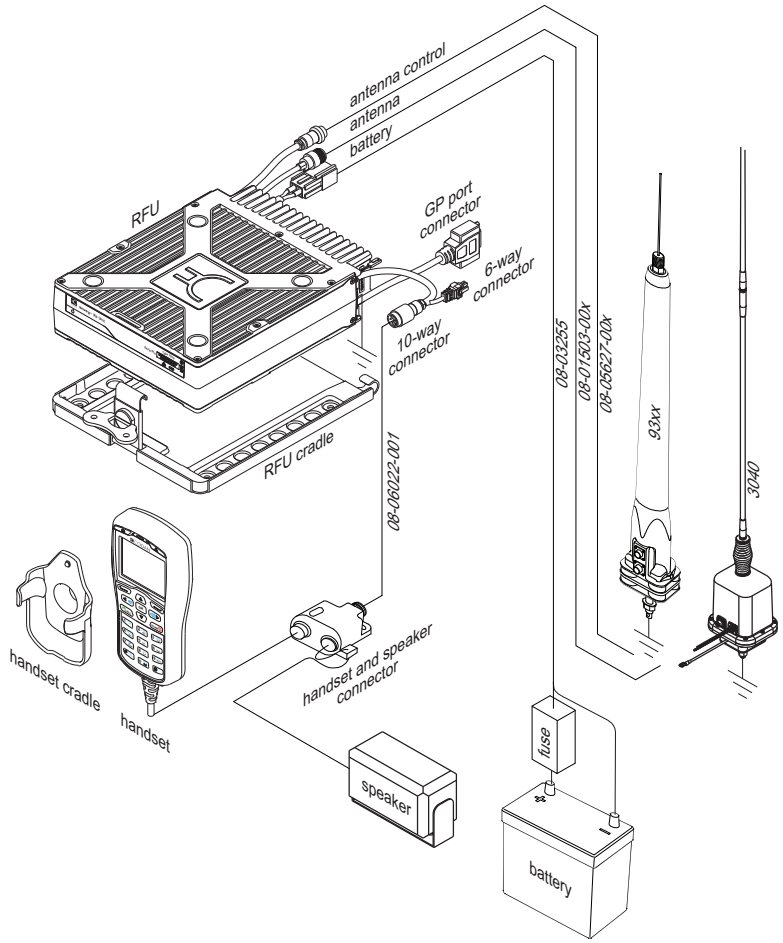
Mobile stations

Overview of mobile stations

A mobile station typically consists of an RFU, a handset, a 12 V DC power supply (battery), an antenna, control and accessory devices, ancillary equipment, and appropriate connecting cables. The antenna is connected to the transceiver by coaxial cable. An automatic tuning antenna also requires a control cable connected to the transceiver.

When space is limited in a mobile situation, the transceiver may be located in the boot or behind/under a seat.

Figure 122: Typical mobile station



NOTE: A range of ancillary equipment may be connected to the Envoy transceiver using the 6-way and GP port connectors at the rear of the RFU.

Installing the transceiver in a mobile station

NOTE: All antennas are supplied completely assembled and ready for installation.

On receiving your Envoy transceiver, check the contents against the packing list. Make sure that all equipment itemised on the packing list is present and that there is no damage to the equipment before you start installing the system.

If anything is missing or damaged, please contact your nearest Codan office immediately to obtain the correct warranty service procedures. This ensures prompt assistance, minimal turnaround time, and avoids any freight issues.

We recommend that the equipment is installed by qualified and experienced personnel, to the relevant standards and approvals. For detailed instructions on connecting particular items of equipment, see the relevant document on the CD provided with the *Envoy® Transceiver Getting Started Guide*.

WARNING: While the following information is intended to assist with installation in a vehicle, it is the purchaser's responsibility to ensure that the mounting cradle is installed with due regard to vehicle-occupant safety, particularly in the event of a vehicle accident. Codan accepts no responsibility or liability in the event of injury to vehicle occupants or any other damage due to insecure or otherwise unsafe or inappropriate installation of the mounting cradle.

Positioning the transceiver

When choosing a location for the components of the transceiver, you should be aware of the environmental ratings of each item of equipment as set out in the specifications. They must be mounted in a suitable position that:

- provides physical protection to the transceiver and its cables
- provides easy access to the controls
- provides a free flow of air through the rear cooling fins to dissipate the heat generated by the transceiver
- does not expose the unit to direct sunlight
- does not expose the unit to water ingress
- will not cause injury to motor-vehicle occupants if an accident occurs, for example, *do not* mount the transceiver overhead
- minimises vibration and shock
- ensures correct connection and operation
- provides easy access for maintenance

WARNING: The units of the mobile station should only be mounted on structural components of the vehicle body and not to dress panels. The areas used for mounting may require reinforcement.

Mounting positions that are recommended in a mobile installation include:

- the transmission hump
- in place of the glove box
- behind the seat
- under the dashboard (if safe)

WARNING: Do not mount the transceiver on a cargo barrier as this may void the vehicle manufacturer's warranty.

The mounting position must ensure sufficient cable length is provided to enable the removal of the equipment from the cradle with the various cables connected.

Related links:

Specifications on page 517

Positioning the control points

The control points and speaker must be in a position that:

- suits the operator
- is near the operating position
- is clear of other controls
- is not dangerous to the driver or passengers
- considers cable routing

Installing the cables

WARNING: *Do not* cut the control, coaxial or speaker cable. If the cables are too long, gather the excess neatly and secure each bundle separately so that it is out of the way. Do not stack the bundles together.

CAUTION: Large magnetic fields can be generated along the power cable during transmission and these fields may be coupled into the control cabling. Failure to keep these cables separated causes distortion of the transmitted signal.

The cabling must be in a position that:

- is away from operator's feet
- is secured and concealed as much as possible
- ensures all control cables are separated from the DC power cable (08-03255) by at least 200 mm (8 in), except over short distances where they may pass through the same hole in a bulkhead
- ensures the handset and speaker control cable (08-06022-001) is separated from the antenna control cable (08-05627-00x) and antenna coaxial cable

(08-01503-00x) by at least 200 mm (8 in), except over short distances where they may pass through the same hole in a bulkhead

- ensures excess cable bundles are secured separately
- is secured behind protective metalwork (only if the cables run under the vehicle)

Keep cables in the engine compartment away from:

- heat, for example, exhaust, air-conditioning systems, and water pipes
- oils and corrosive liquids, for example, engine oil, battery fluid, and brake fluid

Power supply

WARNING: All installations should be checked by a qualified technician before power is applied to the transceiver.

Power must be provided by a 12 V DC battery for mobile stations.

Battery power supply

Batteries need to be well-charged and in good condition to ensure effective operation. Poor condition of the battery usually leads to poor performance of your transceiver. This includes reduced power output and signal distortion during transmission.

If a mobile transceiver causes a heavy drain on the vehicle battery, a two-battery system can be used. Generally the vehicle alternator and charge system copes with the extra battery, however, an isolation circuit should be provided between the batteries.

Power supply factors

Voltage drop

The most common causes of voltage drop along a cable are:

- the diameter of the wire is too thin
- the length of the cable is too long

The average current consumption of a transceiver is low except during transmission of voice and data peaks, where high current is needed for short intervals. The power supply cable needs to be sufficiently heavy to supply these current peaks without excessive voltage drop.

Incorrect wiring techniques, including poor choice of connection points and incorrect use of terminal lugs, can also cause a voltage drop.

Related links:

Power and control cabling on page 534

Fuse protection

An external fuse must be fitted in the positive wire as close as possible to the battery to ensure there is no risk of fire if the cable is damaged. The fuse must be of a type that has a low voltage drop at peak currents.

NOTE: A 32 A cartridge fuse (Codan part number 15-00711) is recommended.

Related links:

Protecting the cables on page 536

Noise interference

The transceiver has noise-rejection circuitry and, provided correct connection and routing of the power cable are established, noise interference via the power cable should be kept to a minimum.

For situations where noise and interference from the vehicle is excessive, Codan recommends that you use the Vehicle Interference Suppression Kit (Codan part number 15-00704).

Related links:

Connecting the battery supply on page 535

Wiring techniques

Correct wiring techniques can reduce voltage drop. These include choosing good connection points and using terminal lugs correctly.

Connecting the power supply

Power and control cabling

The connection from the transceiver is made directly to the battery/power source via a twin core cable.

The cable should:

- be of adequate electrical capacity
- be fused in the positive leg at or near the battery terminal
- not be used to provide power connections to any other equipment

The cable from the battery must be able to carry the full supply current, so it must be of correct size. As the distance between the transceiver and the battery increases, the cross-sectional area of the cable must increase proportionally to minimise the voltage drop. For example, a 100 W transceiver positioned 2 m (2 yd) away from the battery requires a cable with a cross-sectional area of approximately 4 mm^2 (11 AWG), whereas a transceiver 5 m (5 yd) away from the battery requires a cable with a cross-sectional area of approximately 10 mm^2 (7 AWG).

A heavy-duty power cable is supplied with the vehicle-mounting cradle for mobile stations. This cable minimises the voltage drop between the battery and transceiver during transmission.

CAUTION: If you use a thinner cable, signal quality may be affected.

Related links:

Voltage drop on page 533

Connecting the battery supply

A battery supply may be used as a direct source of power in a mobile installation, or as a back-up source of power in a fixed installation.

To connect the battery supply:

- Connect the red positive and black negative wires from the power cable of the transceiver to the positive and negative terminals of the battery, respectively.
- Fit a suitable fuse as near as practicable to the positive side of the battery connection.

  A 32 A cartridge fuse (Codan part number 15-00711) is recommended.

  CAUTION: *Do not* connect the power supply to the ignition switch or the body next to the transceiver due to voltage drop and noise interference.
- Route the power cable away from other vehicle wiring, including high-voltage ignition wiring between the spark plugs, distributor and coil.

  CAUTION: Ensure the power cable does not run together with, or parallel to, the control cables for any long distance.

  Where wiring passes through any bulkhead, provide appropriate grommets to prevent insulation being cut.
- Terminate the transceiver power cable with connector lugs.
- Secure the power cable using cable ties.
- Test that the power supply and transceiver work correctly.

Using a terminal block

A terminal block can be fitted where heavy cables are used for long cable runs, or where the tools or materials may not be available to re-terminate the transceiver supply connector. The terminal block is fitted next to the transceiver to connect the cable from the battery to the transceiver power cable. The length of the cable between the terminal block and the transceiver should not exceed 500 mm (20 in) so that voltage drop is minimised.

To connect a terminal block:

- Cut the connector from the end of the battery cable.
- Strip 10 mm (½ in) of the insulation from the cable.
- Insert the cable into the terminal block, ensuring the screws of the terminal block are completely undone before inserting the wires.

  Observe correct polarity.

- Turn the screws into place.

  Ensure there are no stray wires.

Protecting the cables

Physical protection

Protect all the cables from sharp edges and mechanical abrasions. Cables that pass through panels or walls must be protected by grommets. Such holes need only be large enough to allow the end of the cable with the smaller connector to pass through. Removing a connector should be a last resort. Externally, the cable and connectors need to be weatherproofed using self-amalgamating rubber tape.

CAUTION: Removal of factory-fitted connectors may cause cable or connector faults.

CAUTION: Crimp-style coaxial connectors for vehicle installations should be avoided because they are susceptible to mechanical damage and are not weatherproofed.

NOTE: Any cabling under carpet or floor mats should be clear of foot traffic.

Electrical protection

The transceiver is provided with adequate internal protection. The transceiver supply is also fitted with adequate protection.

If a battery is used, Codan recommends that a suitable cartridge fuse (32 A, Codan part number 15-00711) is fitted in the positive wire, close to the battery. This protects the power cable from risk of fire if damaged insulation should touch surrounding metalwork.

As the fuse is not included to protect the transceiver circuits, it should be of large physical and electrical size to eliminate the possibility of voltage drops across the fuse.

WARNING: Do not use normal glass in-line automotive fuses.

Earthing the transceiver in a mobile station

A good RF earth is essential for efficient operation of the mobile station. The transceiver chassis should be connected to earth via the earth screw on the rear panel of the transceiver. Use a copper braid of at least 12 mm (½ in) width to connect the transceiver to the earthing point.

NOTE: Keep the earth braid as short as possible.

All individual units in a mobile station should be earthed to prevent RF interference corrupting the data and audio circuits. Equipment that requires earthing has an earth screw fitted. To achieve good earthing, connect separate earth braids to the earth screws on each piece of equipment and connect them back to the same earthing point.

An adequate earthing system is necessary for:

- static drain
- noise reduction

Related links:

Static drain on page 537
Noise reduction on page 537

Static drain

In some cases, wind-driven particles, such as dry sand, may charge the transceiver and ancillaries to very high voltages above earth. Usually the low-impedance protective earth connection prevents high voltages from building up. In the event that the protective earth is disconnected or does not exist, as for a solar-powered fixed installation, these high voltages may occur.

If the voltage of the electrostatic charge becomes sufficiently high, a flashover could occur between the charged parts and earth. The energy released at flashover depends upon the voltage of the charged parts to earth. This energy generates a steep wave front, which may cause failure in the front end of the transceiver or result in damage elsewhere.

Noise reduction

In some cases, noise can be reduced by connecting the case of the transceiver directly to earth. If an improvement is noticed, the existing functional RF earth may be inadequate and need improvement.

Where the antenna and transceiver must be installed in close proximity, directly earthing the transceiver may be necessary to eliminate RF feedback.

Troubleshooting the mobile installation

Common problems caused by incorrect installation are listed in Table 43.

Table 43: Possible faults in the mobile installation

Symptom	Possible cause	Action
No power	The internal fuse of the transceiver has blown	Replace the fuse.
	Poor connections	Check that the battery is connected correctly to the transceiver.
	Power not switched on	Check that the AC mains supply and the transceiver supply are both switched on.
	Battery not supplying the correct voltage, or is in poor condition	Check battery supply.
Tuning fails	Inadequate earthing of the antenna	Antenna mounting bracket should be welded or bolted directly to the chassis. All paint should be cleaned from mating surfaces. The earth braid provided should be connected to an independent earthing point going to the bodywork of the vehicle, or to the battery negative if possible.
Distortion of the transmit audio signal	Inadequate earthing of the transceiver to the vehicle chassis	Improve the earth of the transceiver by connecting an earth strap (braid or copper strip) from the earth screw of the transceiver to the vehicle chassis, keeping the strap as short as possible.
Transceiver is not responding to instructions	The transceiver may not be connected correctly	Check that the cables and connectors between all items of equipment are securely connected and not damaged.
	Faulty cables and/or connectors	Check that the cables and connectors between all items of equipment are securely connected and not damaged.
Voltage drop in the fuse, the control leads, or the battery	Voltage less than 12 V DC	Check the voltage; it must be greater than 12 V DC on transmit.

Table 43: Possible faults in the mobile installation (cont.)

Symptom	Possible cause	Action
Control point disconnects from RFU or unexpected behaviour of user interface	Inadequate earthing of the antenna	Antenna mounting bracket should be welded or bolted directly to the chassis. All paint should be cleaned from mating surfaces. The earth braid provided should be connected to an independent earthing point going to the bodywork of the vehicle, or to the battery negative if possible.
	Inadequate earthing of the RFU	Improve the earth of the transceiver by connecting an earth strap (braid or copper strip) from the earth screw of the transceiver to the earth point, keeping the strap as short as possible.
	Control point cable is not separated adequately from antenna control and coaxial cables	Separate the control point cable from the antenna control cable and the antenna coaxial cable by at least 200 mm (8 in), except over short distances where they may pass through the same hole in a bulkhead.

Related links:

Radiation safety (non-EU installations) on page 619
Radiation safety (EU installations only) on page 617
Earthing the antenna on page 540
Standing wave ratio on page 545
Earthing the transceiver in a mobile station on page 536

Installing the antenna

WARNING: The antenna should be installed by a suitably qualified technician, to the relevant standards and approvals.

NOTE: Correct installation of the antenna provides efficient operation over the frequency range of the transceiver. It ensures the antenna provides maximum output power during transmission and clear reception of weak signals.

Positioning the antenna

For information on positioning a mobile antenna, see the documentation provided with the antenna.

Connecting the antenna to the transceiver

A vehicle antenna is a tuned antenna, and therefore, must be connected to the transceiver using 50 Ω coaxial cable. Type RG58 cable is normally used. The cable should be as far as possible from other vehicle wiring, especially high-voltage ignition wiring.

In addition to an RF coaxial cable connection, an automatic tuning whip antenna also requires a control cable to be connected to the transceiver.

The cables are supplied in standard lengths with the appropriate connectors fitted at either end.

Earthing the antenna

For information on earthing a mobile antenna, see the documentation provided with the antenna.

Tuning a mobile antenna

A mobile antenna uses an automatic tuner to make the physically small whip appear larger to the transceiver.

To tune a mobile antenna:

- Scroll to the channel on which you want to transmit, then press PTT to tune.

Troubleshooting the mobile antenna

Common problems caused by incorrect installation are listed in Table 44.

WARNING: Before using the antenna system see the safety information provided.

WARNING: Poor installation can damage the antenna beyond repair.

Table 44: Possible faults in the mobile antenna installation

Symptom	Possible cause	Action
Antenna tunes when stationary, but fails when mobile	Incorrect positioning of the antenna on the vehicle	Ensure correct installation and tuning procedures are followed. With an SWR meter in place, alter the position of the antenna to achieve best forward-radiated power. Carry out all testing in the open, away from trees and buildings etc. Leaning the antenna away from the bodywork sometimes assists in tuning. Check that the problem does not move to other channels.
Antenna fails to tune certain channels	The antenna and/or tuner may not be earthed correctly	Improve the earth connection. Ensure a good earth connection to the vehicle body is provided by an earth braid or copper strap, keeping it as short as possible. Check the vehicle earth on metal areas close to the antenna and rectify if necessary, for example, the bonnet of the vehicle may be isolated from the main vehicle earth. If the problem persists, shorten or lengthen the coaxial cable between the antenna and the transceiver by approximately 1 m (1 yd). Check that the problem does not move to other channels.
	The antenna may have been tuned without the whip in place	Ensure the whip is in place before tuning.

Table 44: Possible faults in the mobile antenna installation (cont.)

Symptom	Possible cause	Action
Poor radiation efficiency	Poor installation	Improve the earth connection.
	Incorrect positioning of the antenna	Check the position of the antenna, ensuring that the vehicle body is not acting as a shield. With an SWR meter in place, alter the position of the antenna to achieve best forward-radiated power. Check that the problem does not move to other channels.
	The antenna and/or tuner may not be earthed correctly	Improve the earth connection.
SWR is bad	The SWR measurement may have been performed at the RFU rather than at the antenna	Ensure the SWR meter is connected to the coaxial line at the base of the antenna to achieve an accurate reading.
	The antenna may not be positioned correctly	Check the position of the antenna, ensuring that the vehicle body is not acting as a shield. With an SWR meter in place, alter the position of the antenna to achieve best forward-radiated power.
	Faulty coaxial cable or control cable	Replace faulty cables.
	The antenna and/or tuner may not be earthed correctly	Improve the earth connection.

Table 44: Possible faults in the mobile antenna installation (cont.)

Symptom	Possible cause	Action
Voltage drop in the fuse, the control leads, or the battery	Voltage less than 12 V DC	Check the voltage; it must be greater than 12 V DC on transmit.
Control point disconnects from RFU or unexpected behaviour of user interface	Inadequate earthing of the antenna	Antenna mounting bracket should be welded or bolted directly to the chassis. All paint should be cleaned from mating surfaces. The earth braid provided should be connected to an independent earthing point going to the bodywork of the vehicle, or to the battery negative if possible.

Related links:

Earthing the antenna on page 540
Earthing the transceiver in a mobile station on page 536

Radio frequency interference (mobile stations only)

Types of noise

Engine noise and electrical accessories often cause RF interference.

Noise interference can be:

- induced into and carried along the cables to the transceiver
- radiated from the noise source and picked up at the antenna

Table 45: Noise source and type

System	Noise source	Noise type
Ignition	Ignition	Spark plug leads
Battery charging	Alternators	Diode switching and brushes

Table 45: Noise source and type (cont.)

System	Noise source	Noise type
Other	Brakes and bearings	Static discharge
	Oil pressure sender	Contact arcing
	Tachometer	Impulse
	Winches	Motor brushes
	Wipers and fan motors	Motor brushes

Noise from the battery-charging system

Alternator/generator-to-battery wiring

A low-pass filter, such as a Marine Technology type MAR-60A (up to 60 A), should be fitted to the main battery lead at the alternator to minimise noise. The filter must be rated for the maximum current available from the charging system. The earth lug of the filter should attach to the alternator body or the engine block.

Noise suppression

Noise interference is suppressed by:

- shielding/screening, for example, the addition of a physical metallic shield between a noise source and the transceiver
- decoupling to earth, for example, a filter capacitor on the alternator
- providing RF filtering
- maintaining all electrical equipment and connections
- re-routing wiring, for example, separating the antenna feed wire from the battery cable

Most commercial and passenger vehicles are not easily suppressed for noise at radio frequencies. Since shielding of existing cables and devices such as spark plugs is neither practical nor viable for general vehicle installations, RF filtering is the preferred option.

RF filtering involves:

- preventing the noise from being generated
- minimising the noise radiated by the wiring connected to the noise source

An interference suppression kit is available from Codan (Codan part number 15-00704). It contains filters, suppressing capacitors, earth straps and fitting instructions.

The process of eliminating signal interference is by:

- identifying the noise source(s) by noting the difference in the noise levels in the receiver with the motor and accessories switched off then on
- working on each source individually until an acceptable level of suppression is achieved

Alternatively, disconnect all possible sources of noise then replace and suppress them in turn.

Most suppression is carried out using some type of RF filtering. All suppressor devices must be fitted at the source of the interference in order to be effective.

Testing the installation

Following correct installation, the station should be tested for correct operation prior to use in the HF communication network.

Testing involves:

- measuring the SWR
- carrying out station-to-station on-air testing

Standing wave ratio

WARNING: Before using the antenna system see the safety information provided.

An SWR meter measures the forward and reflected powers between a transceiver and its antenna load, and represents these in a ratio called the SWR. To ensure correct installation, the power and SWR assessment should be performed with the transceiver working in its normal antenna system. Press **TUNE** to see the SWR, then press PTT to manually tune the antenna.

If the impedance of the antenna is equal to 50 Ω, no power is reflected. This is the ideal situation, which gives an SWR reading of 1:1. An SWR equal to or lower than 1.8:1 is acceptable. If the SWR is greater than 1.8:1, the ALC circuitry in the transceiver reduces the output power. With some combinations of frequencies and antenna design, it may not be possible to achieve the desired figure on all channels.

CAUTION: The SWR should never rise above 2:1.

Related links:

Radiation safety (non-EU installations) on page 619
Radiation safety (EU installations only) on page 617

Using SWR to test the installation

To test the installation using SWR:

- ☐ Select the highest operating frequency of the transceiver.

- Press PTT to tune the antenna.

  If the antenna installation parameters are within the satisfactory operating range, tuning will be successful and the SWR reading will be less than 2:1.

- Select the lowest operating frequency of the transceiver, then repeat the test.
- If a particular channel frequency does not tune, check the:
  - length of the antenna (for long wire antennas)
  - conductivity of the earthing system
  - orientation of the antenna
- Alter these slightly in an attempt to achieve better tuning.

On-air testing

On-air testing gives a better indication of antenna operation, particularly if the installer is familiar with the signal strengths normally received within an HF communication network. Certain types of test calls can be used to test the installation.

With on-air testing, the difference in equipment between stations must be taken into account when determining the quality of the transmission. For example, a 100 W mobile station may be in contact with a fixed base station using a full-size antenna and high-power transceiver.

Any testing on an automatic tuning antenna should be made on all frequencies of operation. A failure to tune on a particular frequency indicates the antenna base impedance at this frequency has pushed the VSWR outside the acceptable tuning range.

This may be corrected by:

- improving or extending the existing earth system
- altering the length of the coaxial feeder cable (only if the VSWR measurements were made at the transceiver rather than the base of the antenna)

NOTE: It is recommended that the VSWR measurements are made at the base of the antenna. In this case, altering the feeder length has little effect.

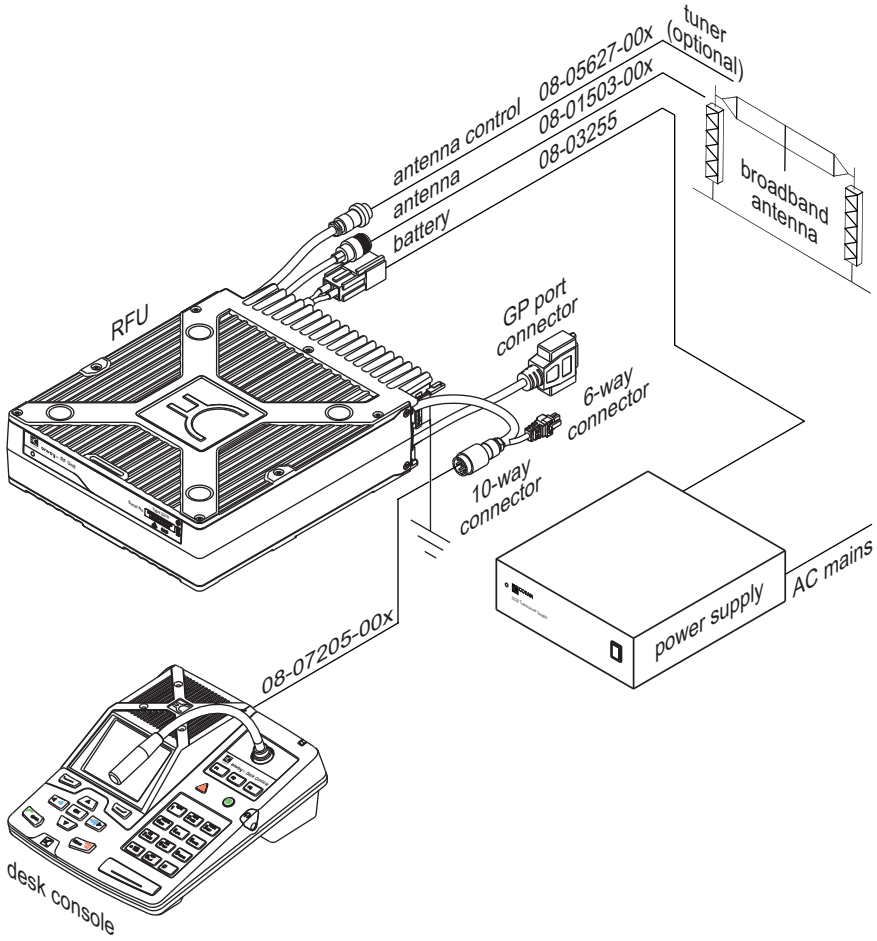
Fixed stations

Overview of fixed stations

A fixed station typically consists of an RFU, a desk console, an AC transceiver supply connected directly to the mains, an antenna, control and accessory devices, ancillary equipment, and appropriate connecting cables. The transceiver is connected to the DC output lead of the transceiver supply. The antenna is connected to the transceiver by coaxial cable.

NOTE: A fixed station may also be powered via a battery system or solar power system.

Figure 123: Typical fixed station



NOTE: A range of ancillary equipment may be connected to the Envoy transceiver using the 6-way and GP port connectors at the rear of the RFU.

Antenna tuners in a fixed station

The purpose of an antenna tuner is to adjust the wavelength of the antenna according to the selected frequency. This ensures an optimum load to the transceiver so that it achieves maximum efficiency. A tuner is usually installed when a single antenna is operating on a range of frequencies, for example, the long wire and vertical whip antennas, and when there is limited space available to install additional antennas.

The radiating portion of the antenna connects directly to the tuner through a high-voltage insulator. The antenna length must be compatible with the tuner installed, and be suitable for the working frequency range.

CAUTION: It is essential that the correct antenna type, site location, and earthing technique be chosen so that the system operates effectively.

NOTE: An antenna tuner is not necessary with a broadband antenna system.

Antenna supports in a fixed station

Supports are used to position the antenna to face the desired direction of communication. The supports suspend the antenna in the air and provide it with adequate rigidity. The supports must be able to withstand extreme environmental conditions.

CAUTION: The antenna may not tune or remain tuned if it sways or sags excessively.

Existing supports can be used, such as trees or windmill towers, if they are suitably positioned according to the desired direction of communication. Support systems also include free-standing or guyed masts.

NOTE: If the supports are unstable, additional support, such as guy anchors, should be provided.

The antenna is tied to various supports by wire or nylon rope guys to ensure the antenna is insulated from its supports. If wire guys are used, two ceramic insulators *must* be provided at each end of the antenna. If metallic supports are used, position the insulators so that the antenna is at least 2 m (2 yd) from the mast. Ceramic insulators ensure the signal is not connected directly to the earth via the metallic supports.

Installing the transceiver in a fixed station

On receiving your Envoy transceiver, check the contents against the packing list. Make sure that all equipment itemised on the packing list is present and that there is no damage to the equipment before you start installing the system.

If anything is missing or damaged, please contact your nearest Codan office immediately to obtain the correct warranty service procedures. This ensures prompt assistance, minimal turnaround time, and avoids any freight issues.

We recommend that the equipment is installed by qualified and experienced personnel, to the relevant standards and approvals. For detailed instructions on connecting particular items of equipment, see the relevant document on the CD provided with the Envoy transceiver Getting Started Guide.

Positioning the transceiver

When choosing a location for the components of the transceiver, you should be aware of the environmental ratings of each item of equipment as set out in the specifications. They must be mounted in a suitable position that:

- provides a free flow of air through the rear cooling fins to dissipate the heat generated by the transceiver
- provides easy access to the controls
- does not expose the unit to direct sunlight
- does not expose the unit to water ingress
- ensures correct connection and operation
- provides easy access for maintenance

Related links:

Specifications on page 517

Installing the cables

WARNING: *Do not* cut the control, coaxial or speaker cable. If the cables are too long, gather the excess neatly and secure each bundle separately so that it is out of the way. Do not stack the bundles together.

CAUTION: Large magnetic fields can be generated along the power cable during transmission and these fields may be coupled into the control cabling. Failure to keep these cables separated causes distortion of the transmitted signal.

Power supply

WARNING: All installations should be checked by a qualified technician before power is applied to the transceiver.

Power can be provided by either:

- a suitable transceiver supply connected directly to the AC mains
- a 12 V DC lead acid battery

CAUTION: Ensure that the power supply to operate your station is 12 V DC.

AC mains power supply

Codan provides a 3020 Transceiver Supply, which can be used with transceivers operating on speech and data communications.

CAUTION: If the distance between the transceiver supply and the transceiver requires the cable to be extended, the cable size may need to be increased to minimise voltage drop.

Related links:

Connecting the AC mains supply on page 551

Battery power supply

Standby batteries are usually used to supply power to the transceiver in case of a mains failure. Sometimes, batteries are used with solar panels to supply the power to fixed stations.

Batteries need to be well-charged and in good condition to ensure effective operation. Poor condition of the battery usually leads to poor performance of your transceiver. This includes reduced power output and signal distortion during transmission.

Power supply factors

Voltage drop

The most common causes of voltage drop along a cable are:

- the diameter of the wire is too thin
- the length of the cable is too long

The average current consumption of a transceiver is low except during transmission of voice and data peaks, where high current is needed for short intervals. The power supply cable needs to be sufficiently heavy to supply these current peaks without excessive voltage drop.

Incorrect wiring techniques, including poor choice of connection points and incorrect use of terminal lugs, can also cause a voltage drop.

Related links:

Power and control cabling on page 534

Fuse protection

An external fuse must be fitted in the positive wire as close as possible to the battery to ensure there is no risk of fire if the cable is damaged. The fuse must be of a type that has a low voltage drop at peak currents.

NOTE: A 32 A cartridge fuse (Codan part number 15-00711) is recommended.

Related links:

Protecting the cables on page 536

Noise interference

The transceiver has noise-rejection circuitry and, provided correct connection and routing of the power cable are established, noise interference via the power cable should be kept to a minimum.

For situations where noise and interference from the vehicle is excessive, Codan recommends that you use the Vehicle Interference Suppression Kit (Codan part number 15-00704).

Related links:

Connecting the battery supply on page 535

Wiring techniques

Correct wiring techniques can reduce voltage drop. These include choosing good connection points and using terminal lugs correctly.

WARNING: It is essential for every mains-energised installation to have an effective connection to the protective earth of the power distribution system in case the basic insulation fails.

WARNING: Without protective earthing, dangerous voltages may be applied to accessible metal parts.

A 3-wire mains cord has an earth wire that provides an effective earth, and is therefore electrically safe. A 2-wire mains cord lacks a protective earth wire, so one must be established by bonding the transceiver supply to an earth stake driven into the ground, or to some other low-impedance earth connection.

Related links:

Connecting the AC mains supply on page 551

Connecting the power supply

Connecting the AC mains supply

An AC mains or a generator-based supply may be used as a direct source of power to a transceiver power supply in a fixed station.

To connect an AC mains supply:

- Fit the plug from the transceiver supply into the AC mains socket.

  The transceiver supply converts the AC power supply to DC.
- Connect the transceiver supply to the transceiver via the DC power leads.
- Ensure the transceiver is earthed correctly.

Most Codan power supplies can use an external battery as an alternative power supply in the event of an AC mains failure. Codan recommends the use of the Standby Battery Cable Kit (Codan part number 15-00702) for easy and correct installation of the standby battery. The cable from this battery must be able to carry the full supply current, so it must be of correct size.

Related links:

Earthing the transceiver in a fixed station on page 552
Power and control cabling on page 534

Protecting the cables

Physical protection

Protect all the cables from sharp edges and mechanical abrasions. Cables that pass through panels or walls must be protected by grommets. Such holes need only be large enough to allow the end of the cable with the smaller connector to pass through. Removing a connector should be a last resort. Externally, the cable and connectors need to be weatherproofed using self-amalgamating rubber tape.

CAUTION: Removal of factory-fitted connectors may cause cable or connector faults.

CAUTION: Crimp-style coaxial connectors for vehicle installations should be avoided because they are susceptible to mechanical damage and are not weatherproofed.

NOTE: Any cabling under carpet or floor mats should be clear of foot traffic.

Electrical protection

The transceiver is provided with adequate internal protection. The transceiver supply is also fitted with adequate protection.

If a battery is used, Codan recommends that a suitable cartridge fuse (32 A, Codan part number 15-00711) is fitted in the positive wire, close to the battery. This protects the power cable from risk of fire if damaged insulation should touch surrounding metalwork.

As the fuse is not included to protect the transceiver circuits, it should be of large physical and electrical size to eliminate the possibility of voltage drops across the fuse.

WARNING: Do not use normal glass in-line automotive fuses.

Earthing the transceiver in a fixed station

A good RF earth is essential for efficient operation of the fixed station. The transceiver chassis should be connected to earth via the earth screw on the rear panel of the transceiver. Use a copper braid of at least 12 mm (½ in) width to connect the transceiver to the earthing point.

NOTE: Keep the earth braid as short as possible.

All individual units in a fixed station should be earthed to prevent RF interference corrupting the data and audio circuits. Equipment that requires earthing has an earth screw fitted. To achieve good earthing, connect separate earth braids to the earth screws on each piece of equipment and connect them back to the same earthing point.

NOTE: Ideally, all earth braids should connect directly back to a single point to prevent earth loops.

An adequate earthing system is necessary for:

- electrical safety
- static drain
- noise reduction

Related links:

Electrical safety on page 553
Static drain on page 553
Noise reduction on page 537

Electrical safety

You must use correct wiring techniques to provide electrical safety for the fixed station.

Related links:

Wiring techniques on page 551

Static drain

In some cases, wind-driven particles, such as dry sand, may charge the transceiver and ancillaries to very high voltages above earth. Usually the low-impedance protective earth connection prevents high voltages from building up. In the event that the protective earth is disconnected or does not exist, as for a solar-powered fixed installation, these high voltages may occur.

If the voltage of the electrostatic charge becomes sufficiently high, a flashover could occur between the charged parts and earth. The energy released at flashover depends upon the voltage of the charged parts to earth. This energy generates a steep wave front, which may cause failure in the front end of the transceiver or result in damage elsewhere.

WARNING: A flashover may result in the failure of the basic insulation of a mains-energised transceiver supply, causing an extreme safety hazard. To avoid a flashover, ensure that the transceiver is correctly earthed.

Noise reduction

In some cases, noise can be reduced by connecting the case of the transceiver directly to earth. If an improvement is noticed, the existing functional RF earth may be inadequate and need improvement.

Where the antenna and transceiver must be installed in close proximity, directly earthing the transceiver may be necessary to eliminate RF feedback.

Troubleshooting the fixed installation

Common problems caused by incorrect installation are listed in Table 46.

Table 46: Possible faults in the fixed installation

Symptom	Possible cause	Action
Tuning fails	Inadequate earthing	Improve the earth of the transceiver by connecting an earth strap (braid or copper strip) from the earth screw of the transceiver to the earth point, keeping the strap as short as possible.
Noise interference	Noise interference by other equipment	Identify the source of interference by switching off other equipment. If possible, move the transceiver and/or antenna away from the noise source.
	Inadequate earthing of the transceiver	Improve the earth of the transceiver by connecting an earth strap (braid or copper strip) from the earth screw of the transceiver to the earth point, keeping the strap as short as possible.
No power	The internal fuse of the transceiver has blown	Replace the fuse.
	Power not switched on	Check that the AC mains supply and the transceiver supply are both switched on.
	Incorrect cable connections	Check that the AC mains outlet, the transceiver supply, and the transceiver are connected correctly.
	Faulty cables and/or connectors	Check that the cables and connectors between all items of equipment are securely connected and not damaged. If the cables or connectors are faulty, contact your Codan representative.
	Battery not supplying the correct voltage, or is in poor condition	Check battery supply.

Table 46: Possible faults in the fixed installation (cont.)

Symptom	Possible cause	Action
Transceiver is not responding to instructions	The transceiver may not be connected correctly	Check that the cables and connectors between all items of equipment are securely connected and not damaged.
	Faulty cables and/or connectors	Check that the cables and connectors between all items of equipment are securely connected and not damaged.
Control point disconnects from RFU or unexpected behaviour of user interface	Inadequate earthing of the antenna	Improve the earth connection.
	Inadequate earthing of the RFU	Improve the earth connection.
	Control point cable is not separated adequately from antenna control and coaxial cables	Separate the control point cable from the antenna control cable and the antenna coaxial cable by at least 200 mm (8 in).

Related links:

Antenna supports in a fixed station on page 548
Earthing the antenna on page 556
Earthing the tuner on page 557
Standing wave ratio on page 545
Earthing the transceiver in a fixed station on page 552

Installing the antenna

WARNING: The antenna should be installed by a suitably qualified technician, to the relevant standards and approvals.

NOTE: Correct installation of the antenna provides efficient operation over the frequency range of the transceiver. It ensures the antenna provides maximum output power during transmission and clear reception of weak signals.

Positioning the antenna

Position the fixed antenna:

- next to the antenna feed point
- free from obstructions such as buildings, trees and vegetation
- at right angles to the desired direction of communication
- away from any other antenna system

NOTE: The transceiver and antenna do not have to be positioned close to each other if connected by coaxial cable. The transceiver and the feed point of the antenna can be up to 20 m (22 yd) apart before heavier low-loss coaxial cable, such as RG213, is necessary.

Horizontal wire antennas, including the dipole, broadband and long wire antennas, have maximum radiation along their length. Radiation is lowest at the ends of the antenna. Therefore, position these antennas at right angles to the desired direction of communication.

Vertical antennas, such as the vertical whip antenna, have an omnidirectional radiation pattern. Therefore, the direction that vertical antennas face is not important as the radiation pattern is generally equal in all directions.

Earthing the antenna

For a fixed antenna, requirements of the earth plane depend upon the type of antenna selected and the location of the antenna, that is, on open ground or on a roof-top.

When installing an antenna on open ground, earth conductivity is often insufficient to provide adequate earthing, especially on well-drained sandy, rocky or loamy soils. An earth plane should be used to provide adequate earthing of the antenna. For a vertical antenna, an efficient earth plane is provided by a counterpoise consisting of at least four radials extending from the base of the antenna. The radials should be buried approximately 10 cm (4 in) below the surface. An earth mat for an antenna mounted on open ground can be supplied by Codan (Codan part number 15-00158).

When installing an antenna on roof-tops where there is no existing earth plane, an earth plane should be installed. The earth plane should be a conducting surface extending several wavelengths in all directions around the antenna. This can be provided by placing a screen of wire mesh or similar material over the roof of the building. Usually, a counterpoise system is used to provide an efficient earth plane. For example, the counterpoise system for a vertical antenna should consist of at least 8 to 10 radials bonded together at the base of the antenna. A radial earth plane for an antenna mounted on the roof-top of a building can be supplied by Codan (Codan part number 15-00159).

If an earth plane, such as a counterpoise, cannot be provided for the antenna, an earth wire connected to a suitable earth stake can be used, but with reduced efficiency.

NOTE: As the earth wire forms part of the antenna system, any resistance in the earthing network reduces the efficiency of the antenna.

CAUTION: The earth connections are subject to corrosion and oxidation. All joints must be clean, and the hardware adequately tightened. The joints can be protected by the application of silicone grease. In severe conditions, joints should be covered with self-amalgamating tape followed by a layer of good quality UV-stable PVC tape.

CAUTION: RF earthing should not be relied upon to provide protective earthing. It can fail upon the removal of one of the interconnecting links. A separate wire should always be connected to the item that you want to protect.

Positioning the tuner

Due to high voltages on the antenna, position the tuner so that the antenna-to-tuner connection is isolated from accidental contact with conducting surfaces.

WARNING: It is essential that the antenna be positioned at least 50 mm (2 in) from a conducting surface.

CAUTION: Avoid kinks in the lead-in wire of the antenna.

Connecting the antenna to the tuner

When routing the antenna wire to the tuner:

- keep the length of the antenna wire inside the building to a minimum and away from metal objects
- a minimum hole diameter of 100 mm (4 in) is necessary for wiring that passes through a wall or roof, and the wiring should pass through the centre of this hole using a grommet or other suitable insulator
- wiring must not come into contact with guttering, eaves etc, upon entering or leaving a building

Earthing the tuner

The earth system is a key part of the overall antenna system. An inefficient earth system is a primary cause of poor performance and difficulty in adjusting the tuner.

The earth system should be connected to the earth stud on the tuner by a heavy copper wire or braid. The connection from the tuner to the earth must be a small percentage of the total length of the antenna, that is, the earth braid must be kept as short as possible.

CAUTION: Do not use an earth strap that exceeds 1.5 m (5 ft).

In areas of good earth conductivity, an effective earth can be established with an earth spike. The spike should be approximately 3 m (10 ft) in length and should be installed as close as possible to the tuner. It may be necessary to use several earth spikes bonded together to improve the earth contact.

Copper or steel water pipes can be suitable earths, provided that:

- the water pipe is close to the tuner
- the water pipe enters the ground very close to the tuner earthing point
- there are no joints or couplings in the pipe that may increase the resistance path to earth
- the water pipe makes good contact to soil that has good conductivity
- a low resistance connection is made to the water pipe

Troubleshooting the fixed antenna

Common problems caused by incorrect installation are listed in Table 47.

WARNING: Before using the antenna system see the safety information provided.

WARNING: Poor installation can damage the antenna beyond repair.

Table 47: Possible faults in the fixed antenna installation

Symptom	Possible cause	Action
Antenna fails to tune certain channels	The antenna and/or tuner may not be earthed correctly	Improve the earth connection.
	Incorrect positioning of the antenna	Check that the position of the antenna corresponds to the desired direction of communication. The antenna must also be positioned away from trees, buildings etc, which provide a shielding effect and diminish the efficiency of the antenna. With an SWR meter in place, alter the position of the antenna to achieve best forward-radiated power.
	Inadequate support of the antenna	Ensure the antenna has adequate support so that it does not sway or sag. If required, use antenna supports such as guyed masts.

Table 47: Possible faults in the fixed antenna installation (cont.)

Symptom	Possible cause	Action
Poor radiation efficiency	Poor installation	Improve the earth connection.
	Incorrect positioning of the antenna	Check that the position of the antenna corresponds to the desired direction of communication. The antenna must also be positioned away from trees, buildings etc, which provide a shielding effect and diminish the efficiency of the antenna. With an SWR meter in place, alter the position of the antenna to achieve best forward-radiated power. If the problem persists, check the antenna length (for long wire antennas), the length of the antenna feed wire, and the conductivity of the earthing system. Alter these slightly in an attempt to achieve better tuning. Check that the problem does not move to other channels.
	The antenna and/or tuner may not be earthed correctly	Improve the earth connection.

Table 47: Possible faults in the fixed antenna installation (cont.)

Symptom	Possible cause	Action
SWR is bad	The SWR measurement may have been performed at the RFU rather than at the antenna	Ensure the SWR meter is connected to the coaxial line at the base of the antenna to achieve an accurate reading.
	The antenna may not be positioned correctly	Check that the position of the antenna corresponds to the desired direction of communication. The antenna must also be positioned away from trees, buildings etc, which provide a shielding effect and diminish the efficiency of the antenna. With an SWR meter in place, alter the position of the antenna to achieve best forward-radiated power.
	Faulty coaxial cable or control cable	Replace faulty cables.
	The antenna and/or tuner may not be earthed correctly	Improve the earth connection.
Antenna detunes	Inadequate support of the antenna	Ensure the antenna has adequate support so that it does not sway or sag. If required, use antenna supports such as guyed masts.
Control point disconnects from RFU or unexpected behaviour of user interface	Inadequate earthing of the antenna	Improve the earth connection.

Related links:

Earthing the antenna on page 556
Earthing the tuner on page 557
Earthing the transceiver in a fixed station on page 552

Testing the installation

Following correct installation, the station should be tested for correct operation prior to use in the HF communication network.

Testing involves:

- measuring the SWR
- carrying out station-to-station on-air testing

Standing wave ratio

WARNING: Before using the antenna system see the safety information provided.

An SWR meter measures the forward and reflected powers between a transceiver and its antenna load, and represents these in a ratio called the SWR. To ensure correct installation, the power and SWR assessment should be performed with the transceiver working in its normal antenna system. Press **TUNE** to see the SWR, then press PTT to manually tune the antenna.

If the impedance of the antenna is equal to 50 Ω, no power is reflected. This is the ideal situation, which gives an SWR reading of 1:1. An SWR equal to or lower than 1.8:1 is acceptable. If the SWR is greater than 1.8:1, the ALC circuitry in the transceiver reduces the output power. With some combinations of frequencies and antenna design, it may not be possible to achieve the desired figure on all channels.

CAUTION: The SWR should never rise above 2:1.

Related links:

Radiation safety (non-EU installations) on page 619
Radiation safety (EU installations only) on page 617

Using SWR to test the installation

To test the installation using SWR:

- Select the highest operating frequency of the transceiver.
- Press PTT to tune the antenna.

  If the antenna installation parameters are within the satisfactory operating range, tuning will be successful and the SWR reading will be less than 2:1.
- Select the lowest operating frequency of the transceiver, then repeat the test.
- If a particular channel frequency does not tune, check the:
  - length of the antenna (for long wire antennas)
  - conductivity of the earthing system
  - orientation of the antenna
- Alter these slightly in an attempt to achieve better tuning.

On-air testing

On-air testing gives a better indication of antenna operation, particularly if the installer is familiar with the signal strengths normally received within an HF communication network. Certain types of test calls can be used to test the installation.

With on-air testing, the difference in equipment between stations must be taken into account when determining the quality of the transmission. For example, a 100 W fixed station may be in contact with another fixed station using a full-size antenna and high-power transceiver. Fixed stations sometimes use split sites, where the receivers are located in a noise-free area, therefore, signal quality is improved because noise interference is minimised.

B LED indications

The front panel of the RFU has a LED indicator that shows the current status of the unit.

Table 48: LED indications

Colour	Status	Description
Off	–	RFU is switched off
Green	Solid	RFU is ready and operational
	Slow flashing	RFU is ready, but has no control points connected
	Slow flashing with flicker of yellow	RFU needs to be switched off then on again to activate changes
	Slow flashing with red	RFU is experiencing a non-fatal error
Yellow	Solid	RFU is initialising
	Slow flashing	RFU is off line due to internal reconfiguration
	Slow flashing with flicker of red	RFU is in bootloader mode
	Alternate flashing with red	RFU or RM50 module is upgrading firmware
Red	Solid	RFU requires attention or servicing

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C HF radio transmission

This section contains the following topics:

HF radio transmission

The HF band is the range of frequencies between 3 and 30 MHz. HF transceivers usually cover a frequency range of 1.6 to 30 MHz.

Codan HF transceivers transmit on single sidebands. This reduces the power required to send HF signals, and increases the number of channels available within the HF spectrum.

HF transceivers are primarily used for long-range communication where distances of 3000 km (1800 mi) and more are possible. Obstructions such as buildings and mountains have little effect on long-range communication. HF radio can cover such large distances because of the way the transmitted radio signal propagates.

HF radio waves propagate in three ways simultaneously:

- ground wave
- direct wave
- sky wave

Related links:

Ground wave on page 566
Direct wave on page 566
Sky wave on page 566

Ground wave

The ground wave travels near the ground for short distances, typically up to 100 km (60 mi) over land and 300 km (190 mi) over sea. The distance covered depends upon the operating frequency, transmission power and type of terrain.

Direct wave

The direct wave travels in a direct line-of-sight from the transmitter to the receiver.

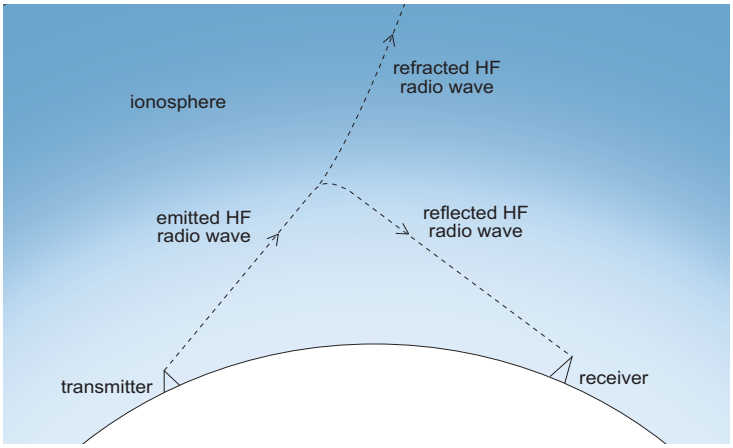
Sky wave

The sky wave is the most important form of HF propagation. The HF radio wave is transmitted toward the sky and is reflected by the ionosphere to a distant receiver on earth.

The reflective properties of the ionosphere change throughout the day, from season to season, and yearly.

HF RADIO TRANSMISSION

Figure 124: The reflective properties of the ionosphere



Frequency, distance and time of day

The extent to which an HF radio wave is reflected depends on the frequency that is used. If the frequency is too low, the signal is absorbed by the ionosphere. If the frequency is too high, the signal passes straight through the ionosphere. Within the HF band, low frequencies are generally considered to be in the range of 2 to 10 MHz. High frequencies are above 10 MHz.

A frequency chosen for day-time transmission may not necessarily be suitable for night-time use. During the day, the layers of the ionosphere are thick. The layers absorb lower frequencies and reflect higher frequencies. At night, the ionosphere becomes very thin. The low frequencies that were absorbed during the day are reflected, and the high frequencies that were reflected during the day pass straight through.

Summer HF radio communications usually operate on higher frequencies than those used in winter over the same distance.

Solar activity varies over an 11-year cycle. Higher frequencies need to be used during periods of peak activity.

It is important to remember that you may need to change the frequency you are using to achieve the best communication. The general rules of thumb for effective HF radio communication are:

- the higher the sun, the higher the required frequency
- the further the distance, the higher the required frequency

Channels, HF networks and scanning

For transmission and reception to occur over HF, the transceivers must be able to tune to the same frequency. This may be defined in a channel, or the transceiver may be free-tuned to this frequency.

A transceiver that has a range of frequencies on which it can receive a call should have scanning switched on so that all of these frequencies are monitored for calling activity.

Transceivers must also have the same call systems available to be able to detect the call. For example, a call made using an ALE/CALM HF network will send a particular type of preamble before the call. This can only be detected by other transceivers with ALE/CALM HF networks programmed.

Related links:

Overview of channels on page 170
Overview of HF networks on page 194
Overview of scan tables on page 182

Etiquette for the use of HF radio

There is a standard procedure for communicating over HF radio. Before you begin transmitting, switch off scanning, select a channel, then press PTT to initiate tuning of the antenna. Listen to the channel that you are going to use and ensure that there is no voice or data communication taking place. You may need to wait until the channel is clear, or select another channel.

NOTE: If you have **LBT Mode** set to **Enabled** or **Override allowed**, the transceiver checks that a channel is not being used; you do not need to check any channels first.

When you first establish communication with another station it is customary to state their call sign and then your own, using the phonetic alphabet (see Table 49).

For example: 'Alpha Bravo One, this is Alpha Bravo Two. Do you receive me? Over.'

In this example your call sign is AB2 and you are calling a station with the call sign AB1. A call sign is a group of letters and numbers issued by a government authority to identify a station. The phonetic alphabet is used to ensure that your call sign is understood.

The word 'over' is used to signify the end of your transmission. The transceiver may be set up to transmit a short beep when you release the PTT button on the handset. When your conversation with the other party is finished, the party that speaks last should say 'out'.

Swearing or foul language should not be used—heavy penalties can apply.

Keep communication as short as possible.

Table 49: The phonetic alphabet

Letter	Phonetic word	Letter	Phonetic word
A	Alpha	N	November
B	Bravo	O	Oscar
C	Charlie	P	Papa
D	Delta	Q	Quebec
E	Echo	R	Romeo
F	Foxtrot	S	Sierra
G	Golf	T	Tango
H	Hotel	U	Uniform
I	India	V	Victor

Table 49: The phonetic alphabet (cont.)

Letter	Phonetic word	Letter	Phonetic word
J	Juliet	W	Whiskey
K	Kilo	X	X-ray
L	Lima	Y	Yankee
M	Mike	Z	Zulu

Related links:

LBT Mode on page 345

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D Call types and features

This section contains the following topics:

Call types

The type of call that you may send depends upon your operational scenario. You can call another station by entering the address for that station and selecting the type of call that you want to make. For example, if you want to speak to an operator, make a Selective or Emergency call. If you want the stations to automatically exchange information without the need for an operator to answer a call, make a Message, Send Position, Get Position or Get Status call.

If you have the MIL-STD-188-141B ALE option installed, you can make a call from one station to many stations by using a special ALE address syntax.

Table 50: Icons for call types

Call type	Icon	See...
ALE Sounding		*ALE Sounding call* on page 575
Channel Test		*Channel Test call* on page 575
Emergency		*Emergency call* on page 576
Get Position		*Get Position call* on page 577
Get Status		*Get Status call* on page 578
Marine Emergency (hee-haw)		*Marine Emergency call* on page 579
Message		*Message call* on page 579
Phone		*Phone call* on page 580
RFDS Emergency		*RFDS Emergency call* on page 581
Selective		*Selective call* on page 581
Send Position		*Send Position call* on page 582
SMS		*SMS call* on page 582

Table 50: Icons for call types (cont.)

Call type	Icon	See...
Web Message		*Web Message call* on page 583

Table 51: Icons for ALE address syntax calls (MIL-STD-188-141B ALE)

ALE address syntax	Icon	See...
ALL		*ALL call* on page 585
ANY		*ANY call* on page 586
Group Selective		*Group Selective call* on page 587
NET		*NET call* on page 588
Wildcard		*Wildcard call* on page 589

ALE Sounding call

NOTE: The ALE Sounding call type may be used if the MIL-STD-188-141B ALE option is installed.

If you want to update the LQA information stored in other transceivers in your communication network, make an ALE Sounding call. The sounding call is an ALE broadcast call that is made on all channels in the scan tables allocated to the selected HF network. A transceiver that *detects* the sounding call updates the information stored in its LQA database.

Channel Test call

If you want to test the suitability of a channel/mode before you use it to transmit voice or data, make a Channel Test call to a specific station.

A Channel Test call may be made in an ALE/CALM HF network if you have the MIL-STD-188-141B ALE option installed. Information from this call replaces the information stored in the LQA database for the called address using the same HF network for the current time slot. The calling station automatically sends a beacon on each channel/mode combination allocated to the ALE/CALM HF network, recording local and remote BER and SINAD information, and calculating an LQA score. The LQA screen is visible during the Channel Test call.

In a Codan Selcall HF network, a Channel Test call sends a request to the station that you want to call on the channel/mode you have selected. The called station automatically returns an audible test signal (revertive). The volume and clarity of this signal indicates the quality of the channel/mode.

NOTE: If you set up one of the status areas to show the Rx level, you can view the strength of the revertive signal.

You can also test channels once you have started a call.

Related links:

Making a Channel Test call on page 56
MIL-STD-188-141B ALE on page 197
Selecting information to be shown in a status area on page 31
ALE address syntax on page 585

Emergency call

If you want to trigger an emergency alert tone at a particular station and speak with an operator, make an Emergency call. If the GPS Call option is installed in the transceiver and you have a GPS receiver connected and selected as a peripheral device, or you have valid information in the **My Position** entry, your GPS position is sent automatically with the call.

Emergency calls can be sent to several stations at once.

NOTE: When GPS information is sent via a Selcall HF network, the altitude is shown as --.

If you have the FED-STD-1045 ALE/CALM option installed, you can use the global ALL address syntax (@?@) with the Emergency call type to send a call to all stations using the ALE/CALM HF network and common channels. If you have the MIL-STD-188-141B ALE option installed, you can use the ALL, ANY, Group Selective, NET, or Wildcard address syntax with the Emergency call type to send a call to a group of stations using an ALE/CALM HF network.

Related links:

Making an Emergency call on page 69
Group calls in a Codan Selcall HF network on page 596
ALE address syntax on page 585
My Position on page 366
GPS Show Options on page 365

Get Position call

NOTE: You can make a Get Position call if the GPS Call option is installed.

NOTE: The success of your Get Position call depends upon the value selected in the **Respond GPS** entry in the transceiver that you are polling and the privacy mode of the HF network that you are using for the call.

NOTE: If you send a Get Position call in an Open Selcall HF network, the transceiver you are polling must have the **Respond GPS** entry set to **Always respond**.

If you want to obtain the GPS position of a specific station that has the GPS Call option installed and has valid GPS information, make a Get Position call to that station. Get Position calls are automatically answered by the called station so an operator is not required to process the return call.

NOTE: The transceiver uses GPS information from either a connected GPS receiver (selected as a peripheral device), or from valid content in **Settings** > **GPS** > **My Position**.

NOTE: When GPS information is sent via a Selcall HF network, the altitude is shown as --.

The information you receive from a Get Position call is displayed on the screen as it is received and is stored in the Call History.

Related links:

Making a Get Position call on page 66
Respond GPS on page 347
Privacy mode on page 200
My Position on page 366
Call History on page 593
GPS Show Options on page 365

Get Status call

NOTE: The success of your Get Status call depends upon the value selected in the **Respond OTA** entry in the transceiver you are polling and the privacy mode of the HF network that you are using for the call.

NOTE: If you send a Get Status call in an Open Selcall HF network, the transceiver you are polling must have the **Respond OTA** entry set to **Always respond**.

If you want to obtain information on the status of a transceiver at a specific station, such as the power output of the transmitter or the firmware versions installed, make a Get Status call to that station. Get Status calls are automatically answered by the called station so an operator is not required to process the return call.

The information you receive from a Get Status call is displayed on the screen as it is received and is stored in the Call History.

When you make a Get Status call you must specify the type of information you require: Diagnostic, Configuration, or Other message. If you have the MIL-STD-188-141B ALE option installed and the **ALE Site Manager** entry is set to **Auto**, **Manual** or **Restricted**, you have the option of broadcasting your site information to other stations, or requesting site information from other stations. In this case, if you leave the address blank, the transceiver asks if you want to send a Broadcast Site call.

If you want to:

- request diagnostic information from the station that you are calling, select **1: Diagnostic**
- request configuration information from the station that you are calling, select **2: Configuration**
- broadcast your self address to the station that you are calling, select **3: Broadcast Site** (see Table 13)
- request site information from the station that you are calling, select **4: Request Site** (see Table 13)
- send a message, such as an OTA command, select **?: Other**

NOTE: For information on OTA commands, contact your Codan representative.

Related links:

Making a Get Status call on page 67
Respond OTA on page 348
Privacy mode on page 200
ALE Site Manager on page 353
Call History on page 593

Marine Emergency call

If you want to broadcast an emergency hee-haw alert tone, make a Marine Emergency call. The tone is broadcast on the selected channel and will be received by stations with that channel selected.

Related links:

Making a Marine Emergency call on page 72

Message call

If you want to send a text message to another station, make a Message call. You can enter a message at the time you make a call, store up to 10 messages in **User Data** > **Messages**, and store messages in the call information for a contact.

You may insert keywords into the message that are recognised and expanded by the transceiver when the call is sent.

Message calls can be sent to several stations at once.

If you have the FED-STD-1045 ALE/CALM option installed, you can use the global ALL address syntax (@?@) with the Message call type to send a call to a group of stations using an ALE/CALM HF network. If you have the MIL-STD-188-141B ALE option installed, you can use the ALL, ANY, Group Selective, NET, or Wildcard address syntax with the Message call type to send a call to a group of stations using an ALE/CALM HF network.

Message calls are automatically answered by a called station so an operator is not required to take any action. If you make a Message call type using an ALE/CALM HF network, the link terminates immediately after the message is sent.

Messages you receive are displayed on the screen and stored in the Call History.

Table 52: Variations in message length

Call system	Privacy mode	Character set	Maximum message length (number of text characters)
ALE/CALM	Plain	ASCII-64	83 to 90
ALE/CALM	None	ASCII-256	64 to 84
ALE/CALM	Group	ASCII-256	50
Codan Selcall	None	ASCII-127	64

Table 52: Variations in message length (cont.)

Call system	Privacy mode	Character set	Maximum message length (number of text characters)
Codan Selcall	Group	ASCII-256	58
Open Selcall	N/A	ASCII-64	32

NOTE: ASCII-64: This protocol uses all upper-case and numeric characters and some punctuation characters.

NOTE: ASCII-127: This protocol uses all printable ASCII characters up to decimal 127.

NOTE: ASCII-256: This protocol uses full binary encoding or all 8-bit characters.

Related links:

Making a Message call on page 60
Sending recognised keywords with a call on page 598
ALE address syntax on page 585
Call History on page 593
Group calls in a Codan Selcall HF network on page 596
Using multiple addresses for calls in an ALE/CALM HF network on page 597

Phone call

If you want to call a telephone number from the transceiver, make a Phone call. Before you make a Phone call you must know the address of an HF telephone station through which your call can be routed to the public telephone network. A telephone station has a radio/telephone interconnect connected to the transceiver system.

If you have the FED-STD-1045 ALE/CALM option installed, you can use the global ALL address syntax (@?@) with the Phone call type to send a call to a group of HF telephone stations using an ALE/CALM HF network. If you have the MIL-STD-188-141B ALE option installed, you can use the ALL, ANY, Group Selective, NET, or Wildcard address syntax with the Phone call type to send a call to a group of telephone stations using an ALE/CALM HF network.

Related links:

Making a Phone call on page 63
ALE address syntax on page 585

RFDS Emergency call

If you want to trigger an emergency alert tone at an RFDS station, make an RFDS Emergency call. RFDS Emergency calls are made on channels reserved for RFDS use in specific RFDS HF networks.

Related links:

Making an RFDS Emergency call on page 71

Selective call

If you want to speak with an operator at a particular station, make a Selective call. When the station receives the call, the transceiver sounds an alert tone to notify the operator. It sounds similar to a telephone ringing. Selective calls can be heard by any station tuned to or scanning your current channel with their mute switched off. Only the transceiver at the station to which the call is addressed will sound an alert tone.

Selective calls can be made to several stations at once.

If you have the FED-STD-1045 ALE/CALM option installed, you can use the global ALL address syntax (@?@) with the Selective call type to make a voice call to a group of stations using an ALE/CALM HF network. If you have the MIL-STD-188-141B ALE option installed, you can use the ALL, ANY, Group Selective, NET, or Wildcard address syntax with the Selective call type to send a call to a group of stations using an ALE/CALM HF network. The transceiver automatically determines the call icon from the address syntax that you enter in the address.

If you have the MIL-STD-188-141B ALE option installed and the **ALE Selective Message** entry set to **Enabled**, you are able to send a message with the call. You are prompted to attach a message when you send the call. You must use an ALE/CALM HF network to make the call.

Related links:

Making a Selective call on page 55
Group calls in a Codan Selcall HF network on page 596
ALE address syntax on page 585
ALE Selective Message on page 363
Using multiple addresses for calls in an ALE/CALM HF network on page 597

Send Position call

NOTE: You can make a Send Position call if the GPS Call option is installed, and your GPS information is valid.

If you want to send your GPS information to another station, make a Send Position call.

NOTE: The transceiver sends GPS information from either a connected GPS receiver (selected as a peripheral device), or from valid content in **Settings** > **GPS** > **My Position**.

NOTE: When GPS information is sent via a Selcall HF network, the altitude is shown as --.

Send Position calls can be made to several stations at once.

If you have the FED-STD-1045 ALE/CALM option installed, you can use the global ALL address syntax (@?@) with the Send Position call type to send a position to a group of stations using an ALE/CALM HF network. If you have the MIL-STD-188-141B ALE option installed, you can use the ALL, ANY, Group Selective, NET, or Wildcard address syntax with the Send Position call type to send a position to a group of stations using an ALE/CALM HF network.

Send Position calls are automatically answered by any called stations so an operator is not required to take any action. If you make a Send Position call, the link terminates immediately after the GPS position is sent.

Related links:

Making a Send Position call on page 64
Group calls in a Codan Selcall HF network on page 596
ALE address syntax on page 585
Call History on page 593
GPS Show Options on page 365
My Position on page 366
Using multiple addresses for calls in an ALE/CALM HF network on page 597

SMS call

NOTE: You can make an SMS call when ‘Cell/Sat Modem’ is the selected RFU GP Port peripheral device, and a cellular/satellite modem is connected to your transceiver.

If you want to send an SMS to a mobile phone anywhere in the world, make an SMS call. You can enter an SMS at the time you make a call, store up to 10 SMS entries in **User Data** > **Messages**, and store an SMS in the call information for a contact. UTF-8 input is supported for the language options you have programmed.

SMS calls may only be sent to a single recipient.

NOTE: When making an SMS call, a country code is mandatory in the destination phone number. E.g. +61 for Australian mobile phones.

NOTE: Either a Selcall or ALE HF Network must be selected when making an SMS call. The self address associated with the HF Network is transmitted along with the actual SMS, to identify you to the recipient and allow them to reply with their own SMS. The recipient is provided with instructions (within the SMS) on how to reply to your SMS.

The SMS is transmitted via the cellular or satellite communications link provided by the modem connected to the transceiver. If both communication transports are available, the "least-cost" method is used (as determined by the modem firmware from your current location).

SMS calls do not utilise normal transceiver resources (e.g., channels , PTT, etc.) as they are not sent over HF. You can freely PTT and speak while an SMS call is in progress.

When an SMS is successfully sent by the cellular/satellite modem, the transceiver sounds a tone to notify the operator.

SMS calls you receive are displayed on the screen and stored in the Call History. The transceiver can receive these calls at any point (i.e., the transceiver does not have to be scanning for these calls).

Related links:

Making an SMS call on page 74
Using Codan Convoy on page 116

Web Message call

NOTE: You can make a Web Message call when 'Cell/Sat Modem' is the selected RFU GP Port peripheral device, and a cellular/satellite modem is connected to your transceiver.

If you want to send a Web Message to the Codan Convoy Web Portal, make a Web Message call. You can enter a Web Message at the time you make a call, store up to 10 Web Message entries in **User Data** > **Messages**, and store a Web Message in the call information for a contact. UTF-8 input is supported for the language options you have programmed.

NOTE: Either a Selcall or ALE HF Network must be selected when making a Web Message call. The self address associated with the HF Network is transmitted along with the actual Web Message, to identify you to the recipient and allow them to reply with their own Web Message.

NOTE: No destination address is needed for a Web Message call.

The Web Message is transmitted via the cellular or satellite communications link provided by the modem connected to the transceiver. If both communication transports are available, the “least-cost” method is used (as determined by the modem firmware from your current location).

Web Message calls do not utilise normal transceiver resources (e.g., channels , PTT, etc.) as they are not sent over HF. You can freely PTT and speak while a Web Message call is in progress.

When a Web Message is successfully sent by the cellular/satellite modem, the transceiver sounds a tone to notify the operator.

Web Message calls you receive are displayed on the screen and stored in the Call History. The transceiver can receive these calls at any point (i.e., the transceiver does not have to be scanning for these calls).

Related links:

Making a Web Message call on page 76
Using Codan Convoy on page 116

ALE address syntax

Related links:

ALL call on page 585
ANY call on page 586
Group Selective call on page 587
NET call on page 588
Wildcard call on page 589
Summary of special ALE address syntaxes on page 590

ALL call

NOTE: The global ALL address syntax may be used if the FED-STD-1045 ALE/CALM option or MIL-STD-188-141B ALE option is installed.

An ALL call may be made to all stations that are tuned to or scanning the same frequency in an ALE/CALM HF network. The ALL address syntax may be used with the Emergency, Message, Phone, Selective, or Send Position call type.

The ALL call does not specifically call any stations, and does not request any automatic responses from stations that enter the link. Stations can be configured to accept or to ignore ALL calls.

NOTE: When you use an ALL address syntax through the Selective call type, the call icon changes to the ALL call icon () when the call is started.

The global ALL address syntax is **@?@**. All stations detecting the call enter an ALE link with the calling station, if enabled to do so. The group of linking stations can be narrowed by using a selective ALL address syntax (MIL-STD-188-141B ALE option). In this address, the **?** is replaced by an upper-case letter or number, for example, **@A@**. All stations detecting the call that have this letter or number as the last character in their self address for the ALE/CALM HF network enter the link.

If you send a selective ALL call to a group of stations, you can send another selective ALL call to bring more stations into the link. For example, if you initially call **@A@**, all stations tuned to or scanning the same frequency in an ALE/CALM HF network with an **A** as the last character of their self address enter the link. If you follow this with a call to **@B@**, then a further group of stations with **B** as the last character of their self address also enter the link. If the called stations are already in a link, this link is closed and a new link is created with the new call.

Alternatively, you can send multiple ALL addresses together to make a call to a range of stations, for example, **@A@,@B@**.

Related links:

Summary of special ALE address syntaxes on page 590
Entering an ALE address syntax on page 591
Emergency call on page 576
Message call on page 579
Phone call on page 580
Selective call on page 581
Send Position call on page 582
ALE Accept ALL Call on page 355

ANY call

NOTE: This address syntax may be used if the MIL-STD-188-141B ALE option is installed.

CAUTION: If a station detects an ANY call to its matching self address, it sends a response over the air.

An ANY call may be made to all stations that are tuned to or scanning the same frequency in an ALE/CALM HF network. The ANY address syntax may be used with the Emergency, Message, Phone, Selective, or Send Position call type.

The ANY call does not specifically call any stations, but it does request an automatic response from stations that detect the call. These responses are returned in any slot position (collisions may occur). The operator at the calling station can use these responses to gather information on the status of the stations using the HF network. The calling station then completes the link establishment with an acknowledgement sent to all stations from which it received a response. Stations can be configured to respond to or to ignore ANY calls.

NOTE: When you use an ANY address syntax through the Selective call type, the call icon changes to the ANY call icon () when the call is started.

The global ANY address syntax is **@@?**. All stations detecting the call send a response to the calling station. The group of stations detecting the call can be narrowed by using a selective ANY address syntax. In this address, the **?** is replaced by an upper-case letter or number, for example, **@@A**. All stations detecting the call that have this letter or number as the last character in their self address for the ALE/CALM HF network send a response, then enter a link with the calling station when the acknowledgement is received.

You can send multiple ANY addresses together to make a call to a range of stations, for example, **@@A,@@B**.

The allowable length of the address at the called station is dependent on the length of the self address used for the call by the calling station.

If the length of the self address of the calling station is...	The length of the address at the called station can be...
1 to 3 characters	3 to 9 characters
4 to 6 characters	3 characters

Related links:

Summary of special ALE address syntaxes on page 590
Entering an ALE address syntax on page 591
Emergency call on page 576
Message call on page 579
Phone call on page 580
Selective call on page 581
Send Position call on page 582
ALE Accept ANY Call on page 355

Group Selective call

NOTE: This address syntax may be used if the MIL-STD-188-141B ALE option is installed.

CAUTION: If a station detects a Group Selective call to its matching self address, it sends a response over the air.

A Group Selective call may be made to specific stations that are tuned to or scanning the same frequency in an ALE/CALM HF network. The Group Selective address syntax may be used with the Emergency, Message, Phone, Selective, or Send Position call type.

The Group Selective call requests an automatic response from stations that detect the call and whose self addresses match one of those in the call. These responses are sent in reverse order from that provided in the call. The calling station then completes the link establishment with an acknowledgement sent to all stations from which it received a response.

NOTE: When you use a Group Selective address syntax through the Selective call type, the call icon changes to the Group Selective call icon () when the call is started.

With Group Selective addresses, the length of the combined address can have up to 12 ALE words, excluding commas. An ALE word has 3 characters. There can be up to five different first ALE words in the combined address.

For example, an address of **BOB,BOB2,BOB3,BOB4,TIM,JOHN,MIK,SUE** has five different first ALE words, that is, BOB, TIM, JOH, MIK and SUE. This address has a total of 12 ALE words, that is, BOB, BOB, 2, BOB, 3, BOB, 4, TIM, JOH, N, MIK and SUE.

Related links:

Summary of special ALE address syntaxes on page 590
Emergency call on page 576
Message call on page 579
Phone call on page 580
Selective call on page 581
Send Position call on page 582

NET call

A NET call may be made to a single NET address. Many stations may be programmed to recognise this address when tuned to or scanning the same frequency in an ALE/CALM HF network. A station may be a member of a NET, or may have the NET programmed in its profile without being a member of the NET. A NET address may be used with the Emergency, Message, NET, Phone, Selective, or Send Position call type.

The member stations send an automatic response to the calling station in a pre-determined response slot. The calling station then completes the link establishment with all member stations. If a member station is set up to not respond during its allocated response slot, it still enters the link.

NOTE: When you use a NET address syntax through the Selective call type, the call icon changes to the NET call icon (NET) when the call is started.

The NET address syntax can be any combination of upper-case letters and numbers up to 15 characters, however, for efficiency of NET calls, it is preferable that the address be limited to 3 characters. To make a call using a NET, the NET must be programmed in the transceiver and configured correctly.

Related links:

Summary of special ALE address syntaxes on page 590
Emergency call on page 576
Message call on page 579
Phone call on page 580
Selective call on page 581
Send Position call on page 582

Wildcard call

NOTE: This address syntax may be used if the MIL-STD-188-141B ALE option is installed.

CAUTION: If a station detects a Wildcard call to its matching self address, it sends a response over the air.

A Wildcard call may be made to all stations that are tuned to or scanning the same frequency in an ALE/CALM HF network. The Wildcard address syntax may be used with the Emergency, Message, Phone, Selective, or Send Position call type.

The Wildcard address syntax, which ALE stations recognise, uses the wildcard character **?** as a placeholder for characters within an address of a called station. Stations that detect the call and whose address matches the pattern in the wildcard address send a response to the calling station. These responses are returned in any slot position (collisions may occur). For example, a call sent to **EM?** may be responded to by stations in the communication network with a self address in the ranges EMA to EMZ and EM0 to EM9. The calling station then completes the link establishment with an acknowledgement sent to all stations from which it received a response.

NOTE: When you use a Wildcard address syntax through the Selective call type, the call icon changes to the Wildcard call icon () when the call is started.

NOTE: The wildcard question marks can be in any position within the address. The stations that respond have an address that is the same length as the wildcard address sent from the calling station.

You can send multiple Wildcard addresses together to make a call to a range of stations, for example, **?A,B??**.

The allowable length of the address at the called station is dependent on the length of the self address used for the call by the calling station.

If the length of the self address of the calling station is...	The length of the address at the called station can be...
1 to 3 characters	3 to 9 characters
4 to 6 characters	3 characters

Related links:

Summary of special ALE address syntaxes on page 590
Entering an ALE address syntax on page 591
Emergency call on page 576
Message call on page 579
Phone call on page 580
Selective call on page 581
Send Position call on page 582
ALE Accept Wildcard Call on page 356

Summary of special ALE address syntaxes

You can use a special ALE address syntax to call a group of stations. The types of ALE address syntaxes you can use depend on the options installed in the transceiver.

NOTE: You can use any of the characters in the basic 38 ASCII subset (A to Z, 0 to 9, @ and ?) for the address.

Table 53: Summary of ALE address syntaxes for MIL-STD-188-141B ALE

ALE address syntax	Call sent
@?@	A global ALL call to all listening stations
@*A*@	A selective ALL call to listening stations that have an ***A*** as the last character of their self address (***A*** may be any specified upper-case letter or number), for example, **TNA*A***, **EANB*A***, **1NC*A***, **23*A***
@@?	A global ANY call to all listening stations
@@*A*	A selective ANY call to listening stations that have an ***A*** as the last character of their self address (***A*** may be any specified upper-case letter or number), for example, **TNA*A***, **EANB*A***, **1NC*A***, **23*A***
@*AB*	A double selective ANY call to listening stations that have ***AB*** as the last two characters of their self address (***A*** and ***B*** may be any specified upper-case letter or number), for example, **BA*AB***, **14B*AB***, **Q2C*AB***, **1*AB***
@*A*?	A double selective wildcard ANY call to listening stations that have an ***A*** as the second to last character of their self address (***A*** may be any specified upper-case letter or number) and any upper-case letter or number as the last character, for example, **US*A*M**, **19M*A*0**, **EN*A*9**, **3D*A*Z**
ABC,JK3MN,PQR (example only)	A Group Selective call to the stations specifically addressed
NET address	A NET call to all stations with that NET programmed in **NETs**

Table 53: Summary of ALE address syntaxes for MIL-STD-188-141B ALE (cont.)

ALE address syntax	Call sent
???	A Wildcard call to listening stations that have a self address matching the length of the sent address and with any upper-case letter or number as each of the characters, for example, ***SAM***, ***NAA***, ***234***, ***3AZ***
A?B? (example only)	A selective Wildcard call to listening stations that have a self address matching the length of the sent address with ***A*** and ***B*** as the first and third characters respectively (***A*** and ***B*** may be any specified upper-case letter or number), and with any upper-case letter or number in the second and last characters (in this case), for example, ***A2B*M**, ***AD*B1**, ***AZ*BE**, ***A3*B8**

Related links:

ALL call on page 585
ANY call on page 586
Group Selective call on page 587
NET call on page 588
Wildcard call on page 589

Entering an ALE address syntax

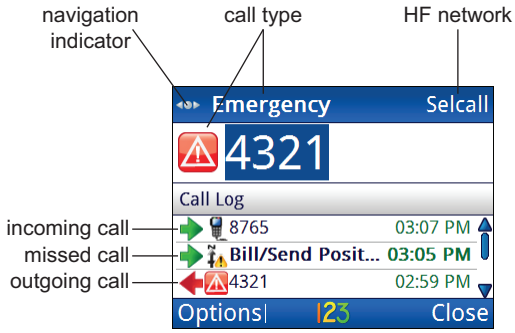
To enter an ALE address syntax during a call:

- Press **CALL**.
- Press (**View**), scroll to **ALE**, then press (**Select**).
- Press ▲ or ▼ to scroll to the pre-defined ALE address syntax that you want to use.
- Press **OK**.

Call Log

The Call Log contains records of the *latest* call sent to or received from a particular address. You can view up to 20 calls. You can scroll through the list of calls in the log and use each record as the basis for a new call. The Call Log is accessed by pressing **CALL** (default behaviour for the **CALL** key).

Figure 125: Call Log



Each item in the Call Log provides information on whether the call was incoming or outgoing, the type of call, the address of the station, and the time of the call. When you have selected an item in the Call Log, the name of the HF network used for the call is shown in the top right of the screen.

When you highlight an item in the Call Log, you can press ◀ or ▶ to scroll to another call type, if required, then press **CALL** to start the calling process.

Related links:

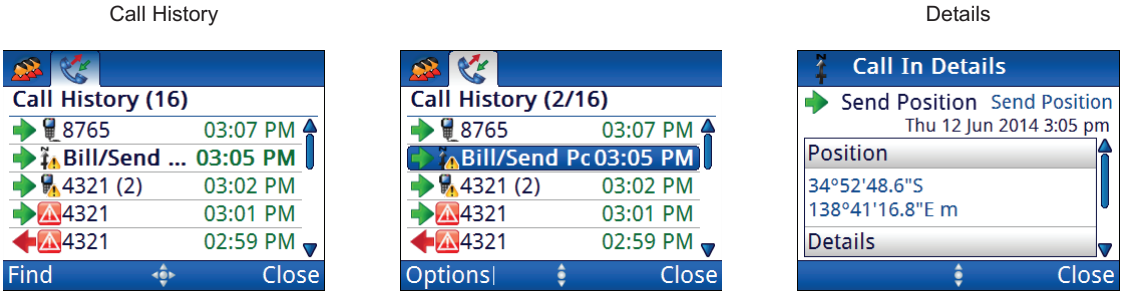
Adding a contact from the Call Log, Call History, or Last Heard Log on page 231
Calling on page 48
Call Key Options on page 310
Call History on page 593

Call History

The Call History contains detailed information for *all* of the calls sent from and received by your transceiver. This includes multiple calls to the same address. The Call History can contain up to 200 sent and received calls, specific to the attached control point. If you connect the control point to another RFU, the control point stores a separate record of the Call History for this RFU, and so on, up to 20 of the most-recently connected RFUs. When you connect the control point to a particular RFU, only that Call History is shown.

You can scroll through the list of calls in the history and use each record as a basis for a new call. The Call History is accessed by *holding* **CALL** (default behaviour for the **CALL** key), then pressing ▶ to select (**Call History**).

Figure 126: Call History and details



Each item in the Call History provides information on whether the call was incoming (➡) or outgoing (⬅), the type of call, the station address, and the time of the call. If the same call has been made or received multiple times, this is indicated in brackets next to the call. If the call occurred within the last 24 hours, the time is indicated in green text. You can also apply a filter to the Call History (2220/2230 only) by pressing **#** to view incoming calls, outgoing calls, and missed calls.

Figure 127: Call History showing incoming, outgoing and missed calls

NOTE: If you want to view two lines of information for each call as you scroll through the Call History, switch to advanced view (+ **2**).

From the top level of the tab, you can search the Call History by pressing (**Find**), then entering the characters on which you want to search. Once an item is selected in the Call History, you can press (**Options**) to select from a number of activities.

You can:

- **Find** a call by entering information about the call
- **Save** the details as a contact
- view the **Details** of the selected item
- **Mark All As Read** for the entire Call History
- **Delete** the selected item only ( )
- **Clear** the entire Call History ( )

Related links:

Adding a contact from the Call Log, Call History, or Last Heard Log on page 231
Making a call from the Call History on page 50
Finding a word or value on page 148
Call Key Options on page 310
Call Log on page 592

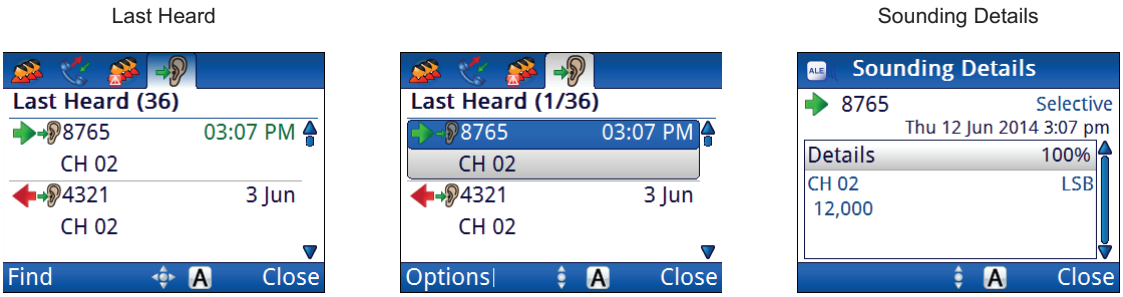
Last Heard Log

NOTE: The Last Heard Log is available if the MIL-STD-188-141B ALE option is installed.

NOTE: You must be in advanced view to see the Last Heard Log.

The Last Heard Log contains detailed information on all of the sounding calls sent from and received by your transceiver. You can scroll through the list of calls in the log and use each record as a basis for a new call. The Last Heard Log is accessed in advanced view by *holding* **CALL** (default behaviour of the **CALL** key), then pressing ▶ to select (**Last Heard**).

Figure 128: Last Heard Log



Each item in the Last Heard Log provides information on whether the sounding was incoming ( ) or outgoing ( ), the station address, the channel used, and the time of the call.

From the top level of the tab, you can search the Last Heard Log by pressing (**Find**), then entering the characters on which you want to search. Once an item is selected in the Last Heard Log, you can press (**Options**) to select from a number of activities.

You can:

- **Save** the details as a contact
- view the **Details** of the selected item
- **Delete** the selected item only ( )
- **Clear** the entire Last Heard Log ( )

Related links:

Switching between basic and advanced views on page 144

Adding a contact from the Call Log, Call History, or Last Heard Log on page 231

Group calls in a Codan Selcall HF network

Emergency, Message and Selective calls can be made to a group of stations simultaneously by using a Codan Selcall HF network and a group address.

A group selcall address is an address that ends in two or more zeros. For example, to call all stations with addresses that range from 1201 to 1299, you would enter **1200** as the address. To call all stations with addresses that range from 150001 to 159999, you would enter **150000** as the address.

NOTE: The transceiver accepts group calls in a Codan Selcall HF network by default. You can disable this feature in **Settings** > **Calling** > **General** > **Selcall Accept Group Call**.

Related links:

Selcall Accept Group Call on page 348

Using multiple addresses for calls in an ALE/CALM HF network

When a call is made in an ALE/CALM HF network, LQA information is stored or updated in the LQA database of the transceiver. If you make a call to a number of addresses using automatic channel selection, you can use the syntax of the address to determine how the LQA information is used, and also the outcome of the call.

If the self addresses of the called stations are separated by a colon, for example, BOB:SAM or 1562:1569, the call is sent to the station on the channel that has the best LQA data associated with it. If the attempt at the first address fails, then the call is sent to the station on the channel with the next best LQA data, and so on.

If the self addresses of the called stations are separated by a semi-colon, for example, SAM;JOHN or 1569;1563, the call is sent to all stations simultaneously (as per a group call), but the link is only established with the station that provided the best response.

The allowable length of the address at the called station is dependent on the length of the self address used for the call by the calling station.

If the length of the self address of the calling station is...	The length of the address at the called station can be...
1 to 3 characters	3 to 9 characters
4 to 6 characters	3 characters

Sending recognised keywords with a call

The keywords listed in Table 54 may be added in a Message call or an AMD message sent with a call. These keywords are recognised by the firmware in the Envoy transceiver. The firmware expands the keyword by inserting the current information associated with the keyword into the message.

NOTE: $GPS and $GPS+ keywords require the GPS Call option to be installed. $GPS+ and $TZ require the MIL-STD-188-141B ALE option to be installed.

Table 54: Recognised keywords and their associated information

Keyword	Function when used in a message
$DATE	Inserts the current date in the following format: *name of daymonthdayyear* For example, Wed Jan 09 2013.
$(GPS) or $GPS	Inserts the current valid GPS position in the following format: *latitudelongitude* For example, 3452.823S 13841.256E. NOTE: Latitude and longitude are expressed in degrees, minutes, and fraction of minutes, with a direction of N/S or E/W. NOTE: If you enter text before $(GPS) or $GPS, this is sent as a header for the GPS information. CAUTION: The $(GPS) keyword should be used in preference to $GPS. If $GPS is used and trailing text is specified, and there is no space separating the two, then $GPS will not be expanded with the current position. Using the $(GPS) keyword avoids this problem.

Table 54: Recognised keywords and their associated information (cont.)

Keyword	Function when used in a message
$GPS+	Inserts the current valid GPS position in the following format: *latitudelongitudealtitudeUTC* (*type of reading*) For example, 3452.823S 13841.256E +113.4M 053657 (A). NOTE: Latitude and longitude are expressed in degrees, minutes, and fraction of minutes, with a direction of N/S or E/W. NOTE: If you enter text before $GPS+, this is sent as a header for the GPS information.
$TIME	Inserts the local time of the transceiver in the following format: *hh*:*mm*:*ss* For example, 05:50:49.
$TZ	Inserts the time zone offset stored in the transceiver in the following format: *time zone offset* For example, +0:00 GMT.
$VER	Inserts the current version of the RFU firmware in the following format: *version number* For example, v1.08.

If you have the MIL-STD-188-141B ALE option installed and the **ALE Selective Message** entry set to **Enabled**, you are able to send a message with a call. If you enter the following message...

$GPS+

...the called station displays the current GPS information for the calling station. For example:

8958.041 N 13841.234 E +0.0M 101622 (A)

NOTE: The transceiver checks the length of the expanded message before transmission. If you receive an error stating that the message is too long, review the message and shorten the message as required.

Related links:

ALE Selective Message on page 363
Entering text in a field on page 152
Entering a special character (2220/2230) on page 153
Entering text with a USB keyboard on page 156

E Definitions

This section contains the following topics:

Acronyms and abbreviations

This term...	Means...
4WD	four-wheel drive
AES	advanced encryption standard
AGC	automatic gain control
ALC	automatic level control
ALE	automatic link establishment
AM	amplitude modulation
AMD	automatic message display
ASCII	American standard code for information interchange
BER	bit error rate
CALM	Codan automated link management
CB	citizen band
CW	continuous wave
CICS	computer interface command set
CR	carriage return
CTS	clear to send
DC	direct current
DSP	digital signal processor
DTE	data terminal equipment
DTR	data terminal ready
DVP	data/voice privacy
EMC	electromagnetic compatibility
ESN	electronic serial number
ETSI	European Telecommunications Standards Institute
FCC	Federal Communications Commission

This term...	Means...
GP	general purpose
GPIO	general purpose input/output
GPS	global positioning system
HF	high frequency
ICNIRP	International Commission on Non-Ionizing Radiation Protection
ID	identification
IF	intermediate frequency
ISB	independent sideband
LBT	listen before transmit
LCD	liquid crystal display
LED	light-emitting diode
LF	line feed
LMCW	lower modulated continuous wave
LQA	link quality analysis
LSB	lower sideband
LSBW	lower sideband (wide filter)
LSBXW	lower sideband (extra wide filter)
MELPe	enhanced mixed-excitation linear prediction
NC	normally closed
NO	normally open
OTA	over-the-air
p–p	peak-to-peak
PA	power amplifier
PEP	peak envelope power
PSU	power supply unit
PTT	press-to-talk

This term...	Means...
RED	radio equipment directive
RF	radio frequency
RFDS	Royal Flying Doctor Service
RFU	RF unit
RNDIS	remote network driver interface specification
RTS	request to send
Rx	receive, received
SB	sideband
SDR	software defined radio
SINAD	(signal + noise + distortion)-to-(noise + distortion) ratio
SMS	short message service
SWR	standing wave ratio
tcvr	transceiver
TIS	ALE keyword ‘this is’
TPE	transmit program enable
TPS™	Transceiver Programming Software
TWAS	ALE keyword ‘this was’
TWELP™	tri-wave excited linear prediction
Tx	transmit
TxD	programming of transmit channels is disabled
TxE	programming of transmit channels is enabled
TxP	programming of transmit channels is prohibited upper
UMCW	modulated continuous wave
USB	upper sideband, universal serial bus
USBW	upper sideband (wide filter)
USBXW	upper sideband (extra wide filter)

This term...	Means...
UTC	universal time coordinated
UTF-8	universal (character set) transformation format, 8-bit
UV	ultraviolet
V	firmware/software version

Glossary

This term...	Means...
address	The HF transceiver equivalent of a telephone number. Your station self address is used by other stations to call you, and it is sent when you make calls to identify you as the caller. It is sometimes referred to as a station ID, or a self ID.
ALE Sounding call	An ALE broadcast call that is made from your transceiver on the channels in the scan table(s) allocated to the HF network that is selected for the call. Stations that detect the call update the relevant information in their LQA database. ALE Sounding calls are available if the MIL-STD-188-141B ALE option is installed.
ALL call	An ALE address syntax used to broadcast to any station that is tuned to or scanning the same frequency in an ALE/CALM HF network. The ALL call uses a special global address syntax @?@ that ALE stations recognise. A selective ALL call addresses a subset of stations. A multiple selective ALL call addresses these subsets within the one call. The global ALL address syntax may be used if the FED-STD-1045 ALE/CALM option is installed. Selective ALL calls may be made if the MIL-STD-188-141B ALE option is installed.
ANY call	An ALE address syntax used to broadcast to any station that is tuned to or scanning the same frequency in an ALE/CALM HF network. The ANY call uses a special global address syntax @@? that ALE stations recognise. A selective ANY call addresses a subset of stations. A multiple selective ANY call addresses these subsets within the one call. The ANY address syntax may be used if the MIL-STD-188-141B ALE option is installed.
automatic gain control (AGC)	A process that automatically adjusts the gain with respect to the input signal to provide a constant output level.
automatic level control (ALC)	A process that automatically provides a constant output level as the input level varies.

This term...	Means...
automatic tuning antenna	An antenna designed for use with multi-channel transceivers. It transforms the frequency-dependent load presented by the antenna to a stable impedance close to 50 Ω to enable the transmitter to operate efficiently.
called station	The station that receives the call. You enter the address of this station, or an appropriate syntax to match the address, when you make a call to this station.
calling station	The station that starts the call.
channel	A frequency and sideband programmed in the transceiver that is used to transmit and receive signals on air.
channel dwell time	The length of time during scanning that the transceiver pauses on each channel in order to detect an incoming call.
Channel Test call	A call that enables you to test the quality of a channel in a Codan Selcall HF network. It is sometimes referred to as a Beacon call. If you have the MIL-STD-188-141B ALE option installed, a Channel Test call may be made in an ALE/CALM HF network to *replace* information in the LQA database.
control cable	A cable connecting two items of equipment that passes control information between items of equipment.
counterpoise	A radial array or a grid network of metallic wires arranged horizontally around the base of an antenna to provide an effective earth plane.
decoupling	The removal of unwanted noise and signal from electronic circuitry by transferring it to ground.
desk console	A control point for the transceiver. It features a microphone, PTT button, keypad, built-in speaker, headphone socket and various connectors.
email station	A point of communication consisting of a transceiver, a data modem, a computer with HF email software and an email client, a power source, an antenna, ancillary equipment, and appropriate connecting cables.
Emergency call	A call that enables you to trigger an emergency alert tone at a specific station then speak to an operator there.
fixed station	A station that is permanently installed and cannot be moved without significant effort. It consists of a transceiver, a transceiver supply, an antenna, control and accessory devices, ancillary equipment, and appropriate connecting cables.

This term...	Means...
frequency	The number of cycles per second of a radio wave, usually expressed in kilohertz.
Get Position call	A call that gets the GPS position of a specific station. You can make a Get Position call if the GPS Call option is installed.
Get Status call	A call that gets diagnostic, configuration, or ALE site manager information about the transceiver at a specific station.
Group Selective call	An ALE call that is sent to stations specifically addressed in the call that are tuned to or scanning the same frequency in an ALE/CALM HF network. The Group Selective call may be used if the MIL-STD-188-141B ALE option is installed.
handset	A hand-held device that is used to control the functions of a transceiver. It consists of a microphone, PTT button, display and keypad.
HF network	A collection of information that defines the call system, scan tables, and self address through which a station sends and receives calls.
hot key	A key on the handset or desk console that is pre-programmed with a macro that enables you to perform a task quickly. The 2221 Handset lists the macros in the **Functions** menu.
independent sideband (ISB)	Two independent modem waveforms that have equal data rates in USB and LSB for a common carrier frequency.
Last Heard log	A log of the last 100 on-air transmissions detected by the current station. The information gathered from each transmission includes the address of the heard station, the time/date of the transmission, and the channel/mode used for the transmission. The Last Heard Log is available if the MIL-STD-188-141B ALE option is installed.
link	A link is established following a 3-way handshake process. Scanning is off and a timeout is active (**Settings** > **Calling** > **General** > **In Call Timeout**). With ALL calls and NET calls that are set to link immediately, the link establishment process is 1-way.

This term...	Means...
listen before transmit (LBT)	The automatic process that the transceiver uses to detect whether or not there is traffic on a channel and, when necessary, select another channel or inform the operator that the channel is busy.
LQA beacon	A Channel Test call that is made in an ALE/CALM HF network using a Group Selective or NET address syntax. The LQA beacon tests all channels in the scan table(s) associated with the HF network to determine the best channel according to local and remote BER and SINAD measurements. On completion of the beacon, the information collected replaces the information for the channel stored in the LQA database. It is sometimes referred to as an ALE beacon. The LQA beacon is available if the MIL-STD-188-141B ALE option is installed.
macro	A short set of instructions to automate a task you perform with the transceiver. When a macro is assigned to a key, the key becomes a hot key. The 2221 Handset lists the macros in the **Functions** menu.
Message call	A call that enables you to send a message to a specific station.
MIL-STD-188-141B ALE	An option that enables you to make ALE ALL, ANY, Group Selective, NET and Wildcard calls, and perform LQA reporting and AMD messaging.
mobile station	A station that is usually mounted in a vehicle or easily transportable. It consists of a transceiver, a power supply, an antenna, control and accessory devices, ancillary equipment, and appropriate connecting cables.
mode	A type of reception or transmission you can use with a channel, comprising a sideband and an IF filter.
NET call	An ALE address syntax that is used to send a call from one station to other stations that have the NET programmed in **NETs**. Stations that have their self address in the **NET Members** entry are members of this NET. The NET address syntax may be used if the MIL-STD-188-141B ALE option is installed.
Phone call	A call that enables you to connect to a public telephone network.

This term...	Means...
PTT button	Press-to-talk button, located on the left side of the handset or bottom right of the desk console. This button enables you to communicate during voice calls, switch mute off temporarily, cancel voice calls prior to the point where voice can be transmitted, cancel calls where data is being transmitted, and exit out of editable screens without saving changes.
receive frequency	A frequency that carries modulated information that is received from a remote transceiver.
revertive	A signal sent by a station in response to a call.
RF filtering	A device fitted to prevent noise from being generated and to minimise the noise radiated by the wiring connected to the noise source. These devices include filters, suppressing capacitors, and earth straps.
RFU	The unit in a transceiver that modulates audio signals onto radio frequencies that can be transmitted on air, and that demodulates the radio frequencies it receives into audio signals.
RM50	The RM50 module is a hardware board optionally fitted in the Envoy transceiver, standard for the Sentry-H transceiver, that enables DV options with/without an AES-256 Encryption upgrade and MIL/STANAG 2G Data option.
SDR	Software Defined Radio. Codan HF SDR series includes Envoy X1, Envoy X2 and Sentry-H.
Selective call	A call that enables you to contact a specific station then speak to an operator.
Send Position call	A call that sends your GPS position to a specific station. You can make a Send Position call if the GPS Call option is installed, and your transceiver has a GPS position registered.
shielding	A metallic barrier that is positioned between a noise source and the transceiver to minimise noise interference.
sideband	A band of frequencies that is above or below a modulated carrier frequency.
standing wave ratio (SWR)	The ratio of the maximum and minimum voltages on a transmission line of the standing wave resulting from the interaction of the forward and reflected waves. It is a measure of how well the antenna load matches the characteristic impedance of the line, which can be measured by an SWR meter.

This term...	Means...
station	A point of communication consisting of a transceiver, a power supply, an antenna, control and accessory devices, ancillary equipment, and appropriate connecting cables.
telephone station	A point of communication consisting of a transceiver, a radio/telephone interconnect, a connection point to a public switched telephone network, a power supply, an antenna, control and accessory devices, ancillary equipment, and appropriate connecting cables.
transceiver	An RFU, handset with speaker or desk console, and appropriate connecting cables.
transmit frequency	A frequency that carries modulated information to a remote transceiver.
Wildcard call	An ALE address syntax used to broadcast to any station that is tuned to or scanning the same frequency in an ALE/CALM HF network. The Wildcard address syntax, which ALE stations recognise, uses the wildcard character **?** as a placeholder for characters within an address of a called station. A multiple Wildcard call uses multiple wildcard addresses in the one call. Stations with matching addresses respond to the call. The Wildcard address syntax may be used if the MIL-STD-188-141B ALE option is installed.

Units

NOTE: Imperial dimensions are in United States Customary Units.

Measurement	Unit	Abbreviation
Wire size	American wire gauge	AWG
Capacitance	farad	F
Current	amp	A
Frequency	hertz	Hz
Impedance	ohm	Ω
Length	metre	m
	(inch/feet/yard/mile)	(in/ft/yd/mi)
Power	watt	W
Power ratio	decibel	dB
Temperature	degrees Celsius	°C
	(Fahrenheit)	(°F)
Time	second	s
	hour	h
Voltage	volt	V
Weight	gram	g
	(pound)	(lb)

Unit multipliers

NOTE: Units are expressed in accordance with ISO 1000:1992 ‘SI units and recommendations for the use of their multiples and of certain other units’.

Unit	Name	Multiplier
M	mega	1000000
k	kilo	1000
m	milli	0.001
µ	micro	0.000001
n	nano	0.000000001
p	pico	0.000000000001

About this issue

This is the seventh issue of the Envoy transceiver Reference Manual. It relates to firmware V2.01, or later. New features include Codan Convoy, DVP-200 modem support, RM50 firmware upgrade capability and USB Keyboard support.

F Compliance

This section contains the following topics:

Overview

This section describes how to ensure the Envoy transceiver complies with the European Radio Equipment Directive (RED) 2014/53/EU.

This section also contains the requirements for FCC and RCM.

European Radio Equipment Directive 2014/53/EU

The Envoy transceiver has been tested and complies with the following standards and requirements (articles of the Radio Equipment Directive 2014/53/EU):

- Article 3.1b: ETSI EN 301 489-1 V1.9.2
- Article 3.1b: ETSI EN 301 489-15 V1.2.1
- Article 3.2: Australian type approval according to AS/NZS 4770:2000 + transmitter RSE tests to the limits specified in Annex 6, section 6.1.2 of CEPT/ERC/Recommendation 74-01E
- Article 3.1a: assessed against ICNIRP and FCC requirements
- Article 3.1a: (LVD) EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011
- Article 3.1a: (MPE) EN 62311:2008

Product marking and labelling

Any equipment supplied by Codan that satisfies these requirements is identified by the CE marking displayed on the product.

Radiation safety (EU installations only)

To ensure optimal transceiver performance and to avoid exposure to excessive electromagnetic fields, the antenna system must be installed according to the instructions provided.

WARNING: High voltages exist on the antenna during transmission and tuning. Do not touch the antenna during these activities. RF burns may result.

WARNING: Install the earthing system or counterpoise as directed to prevent RF burns from any metal part of the transceiver.

WARNING: You should not transmit from your transceiver or tune the antenna unless people are beyond the safe working distance for the installation.

The following safe working distances apply:

- anywhere within the vehicle cabin with an externally mounted mobile antenna
- 3 m unobstructed, of any part of a mobile antenna
- 2 m of any part of a fixed antenna

Safe working distance is based on continuous exposure to CW-type transmissions, as set out in the Human Exposure Restrictions standard EN 62311:2008.

Declaration of Conformity

Hereby, Codan Limited declares that the radio equipment type 2210 HF Radio System, also known as Envoy transceiver, is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address:
https://www.codanradio.com/library/compliance-documents/

Protection of the radio spectrum

CAUTION: EU member states, EFTA countries and Switzerland restrict the use of HF radio communications equipment to certain frequencies and bandwidths and/or require such equipment to be licensed. It is the user's responsibility to check the specific requirements with the appropriate communications authorities in EU member states, EFTA countries and Switzerland. This equipment is subject to national or user licensing conditions before it can be brought into service.

The receive and transmit frequencies may be any frequencies within the HF range, however, the transmit frequencies can only be those allocated to you by the relevant government authority in your country.

Spectral regulations may require the TxD option to be installed in the transceiver. In this case, you cannot add channels with new transmit frequencies. You can, however, add receive-only channels, and channels with the same transmit frequency as an existing channel. If the TxP option is installed in the transceiver, you cannot add channels.

EMC and safety notices

Radiation safety (non-EU installations)

To ensure optimal transceiver performance and to avoid exposure to excessive electromagnetic fields, the antenna system must be installed according to the instructions provided.

WARNING: High voltages exist on the antenna during transmission and tuning. Do not touch the antenna during these activities. RF burns may result.

WARNING: Install the grounding system or counterpoise as directed to prevent RF burns from any metal part of the transceiver.

WARNING: You should not transmit from your transceiver or tune the antenna unless people are beyond the safe working distance for the installation.

The following safe working distances apply:

- anywhere within the vehicle cabin with an externally mounted mobile antenna
- 1.8 m (6 ft) unobstructed, of any part of a mobile antenna
- 2 m (7 ft) of any part of a fixed antenna in a data installation of up to 125 W output
- 5 m (17 ft) of any part of a fixed antenna in a data installation of up to 1 kW output

Safe working distance is based on continuous exposure to CW-type transmissions, as set out in the ICNIRP Exposure Guidelines (1998) for occupational exposure. Safe working distance can be reduced with normal voice communication.

EMC

CAUTION: If it is necessary to remove the covers at any stage, they must be refitted correctly before using the equipment.

To ensure that compliance with the EMC Directive is maintained.

- Use standard shielded cables supplied from Codan (where applicable).
- Ensure the covers for the equipment are fitted correctly.

Electrical safety

To ensure compliance with the European Low Voltage Directive is maintained, you must install and use the Envoy transceiver in accordance with the instructions in the Envoy transceiver Getting Started Guide and the Envoy transceiver Reference Manual.

When using equipment that is connected directly to the AC mains these precautions must be followed and checked before applying an AC mains supply to the unit.

To ensure electrical safety:

- Use the standard AC mains cable supplied.
- Ensure the covers for the equipment are fitted correctly.

CAUTION: If it is necessary for a qualified electronics technician to remove the covers during servicing, they must be refitted correctly before using the equipment.

WARNING: A protective earth connection must be included in the mains wiring to the 3020 Transceiver Supply.

WARNING: The protective cover must always be fitted when the 3020 Transceiver Supply is connected to the AC mains.

Earth symbols

RF earth connection points are provided on the Envoy transceiver and 3020 Transceiver Supply. A protective earth is provided in the AC mains wiring of the 3020 Transceiver Supply. This protective earth must be connected at the AC mains supply outlet. The symbols shown below are used to identify the earths on the equipment.

Table 55: Earth symbols

Symbol	Meaning
	Chassis earth
	Protective earth

FCC compliance

FCC Part 90 certification

The Envoy transceiver has been tested and certified to FCC Part 90 (FCC identifier code DYY2210).

FCC Part 15 compliance

Any modifications made to the Envoy transceiver and 3020 Transceiver Supply that are not approved by Codan Limited for compliance could void user's authority to operate the equipment.

The Envoy transceiver and 3020 Transceiver Supply have been tested and found to comply with the limits for a Class B device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by switching the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- reorient or relocate the receiving antenna
- increase the separation between the equipment and receiver
- connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- consult the dealer or an experienced radio/TV technician for help

RCM approval

The Envoy transceiver meets the requirements of the Australian Communications and Media Authority: Radiocommunications (MF and HF equipment—Land Mobile Service) Standard 2003 (AS/NZS 4770) and Radiocommunications (HF CB and Handphone Equipment) Standard 2008 (AS/NZ 4355).

G Licence information

This section contains the following topics:

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libXML2

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ncurses

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Index

Numerics

A

B

C

D

E

F

G

H

I

K

L

M

N

O

P

Q

R

S

T

U

V

W

Z

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