BARRETT
a Motorola Solutions Company

Barrett PRC-4080 VHF SDR transceiver

Operating and installation manual

Model: 4080-00-00
BCM408000/01

Contents

System overview 1

The PRC-4080 30–175 MHz VHF transceiver is a Combat Net Radio (CNR) designed for multi-role tactical military and security applications. The PRC-4080 is both compact, lightweight, and extremely simple to operate in demanding mission critical conditions.

The PRC-4080 is part of the Barrett family of transceivers that are field proven in over 150 countries, on every continent and in all environments.

This chapter contains the following sections:

- Terms and Abbreviations
- Charging the Battery
- Attaching the Battery
- Attaching the Antenna
- Attaching the H250 Handset or Headset
- Attaching the GPS Receiver
- Switching On and Off
- Transceiver Overview

This manual is for reference only and is subject to change without notice or obligation.

Important safety information

Read and understand the manual before operation. Failure to do so may result in equipment failure or loss of communication.

RF Energy Exposure and product Safety Guide for Mobile Two-Way Radios

CAUTION:

This radio is restricted to Occupational use only.

Terms and abbreviations

Term	Definition
AM	Amplitude Modulation
CTCSS	Continuous Tone-Coded Squelch System
dB	Decibels
dBc	Decibels relative to carrier
FCC	Federal Communications Commission
FHSS	Frequency Hopping Spread Spectrum
FM	Frequency Modulation
Frequency	The rate at which a radio wave oscillates. Measured in kHz.
GMT	Greenwich Mean Time
GPS	Global Positioning System
Hz	Hertz
IC	Industry Canada
IO	In/Out
kbps	Kilobytes per second
kHz	Kilohertz
LCD	Liquid Crystal Display
mA	Milliamp
MGRS	Military Grid Reference System
NATO	North Atlantic Treaty Organization
Net	A frequency and associated settings
MELPe	Multi-Excited-Linear-Prediction enhanced
MMC	Multi-Media Card
OTAZ	Over the Air Zeroise
PC/ABS	Polycarbonate/acrylonitrile butadiene styrene. A thermoplastic blend.
PEP	Peak Envelope Power
PIN	Personal Identification Number
PPM	Pulse per minute
Preset	One or two fixed nets allocated to a position on the preset switch

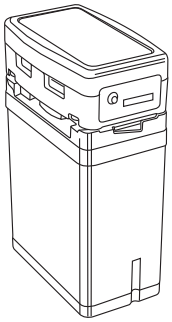
Term	Definition
PTT	Press to Talk
RF	Radio Frequency
RX	Receive
Selcall	Selective Calls
Self ID	The programmed address identification number of a local station. (Used by other stations to call you.)
SINAD	Signal-to Noise- and Distortion
SM	Stealth mode
TWELP	Tri-Wave Excited Linear Prediction
TX	Transmit
USB	Universal Serial Bus
UTM	Universal Transverse Mercator
VHF	Very High Frequency
ZULU	The worldwide 24 hour clock Zulu Time. Also called UTC (Coordinated Universal Time)

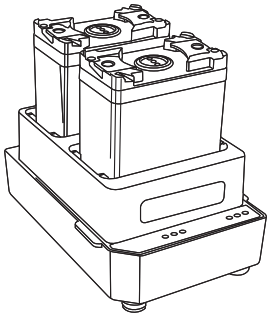
Charging the battery

The PRC-4080 battery should be charged before first use. Only charge the battery with the supplied charger (Brentronics Dual Unit Charger to be purchased separately. Please Contact Barrett Communications).

Single Battery charger (P/N 4080-03-06)

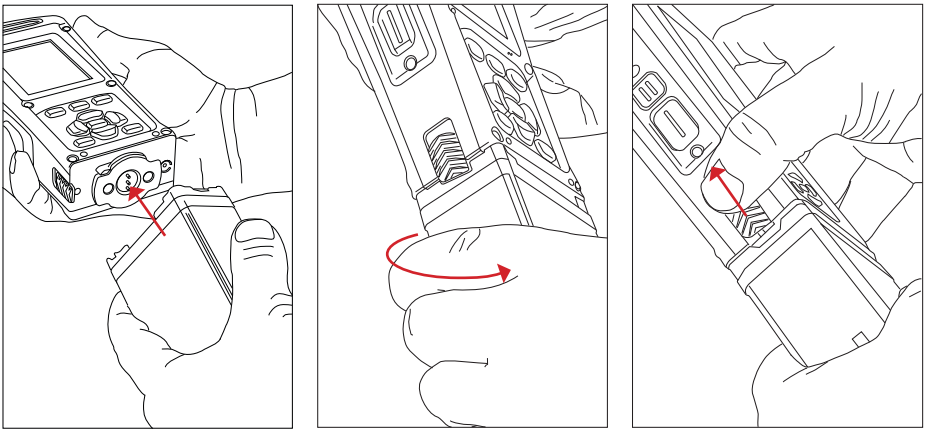
Dual Battery charger (P/N 4080-03-08)





Attaching the battery

Align the battery ensuring that the bottom of the transceiver is in contact with the centre of the battery. Turn the battery 90° anti-clockwise until the locking mechanism clicks.

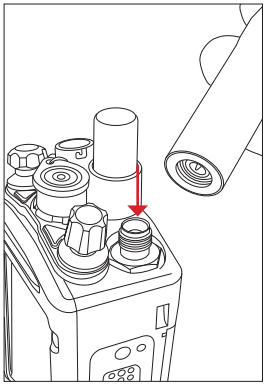


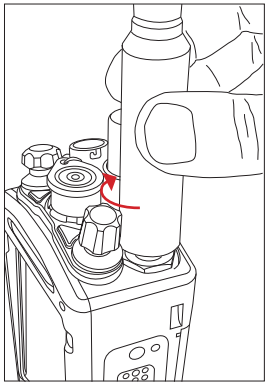
To detach the battery, slide the locking mechanism up, turn the battery 90° clockwise and release.

Attaching the antenna

To attach the supplied 1.2m Tape whip antenna (P/N 4080-02-01). Align the gooseneck to the Antenna/RF connector. Turn the antenna clockwise until secure.

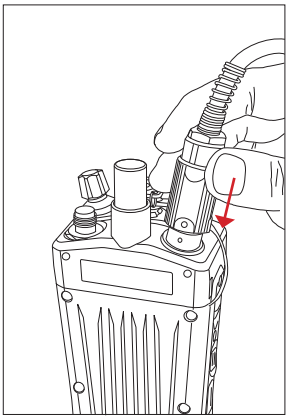
To remove the antenna, turn the gooseneck anti-clockwise until released.

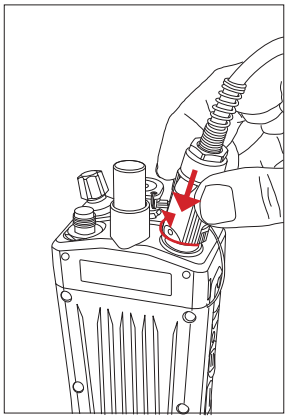


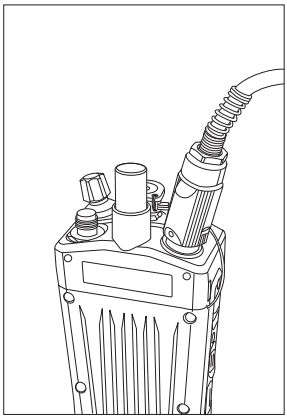


Attaching the H250 handset or headset

Align red/orange dots on the H250 Handset connector and the PRC-4080 H250 connection. Press the handset connector down firmly, rotate connector clockwise and release.





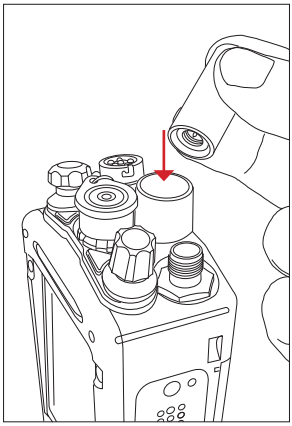


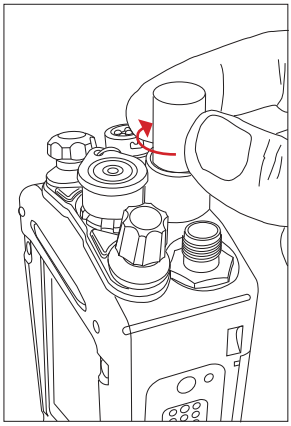
To remove the handset, press the handset connector down firmly and rotate the connector anti-clockwise. Then release and remove handset.

Attaching the GPS receiver

Screw the receiver into the connector clockwise until tight.

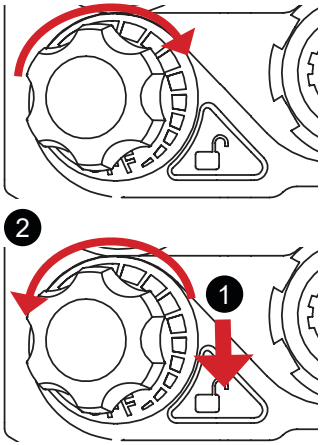
To remove the GPS receiver, turn the receiver anti-clockwise.





Switching on and off

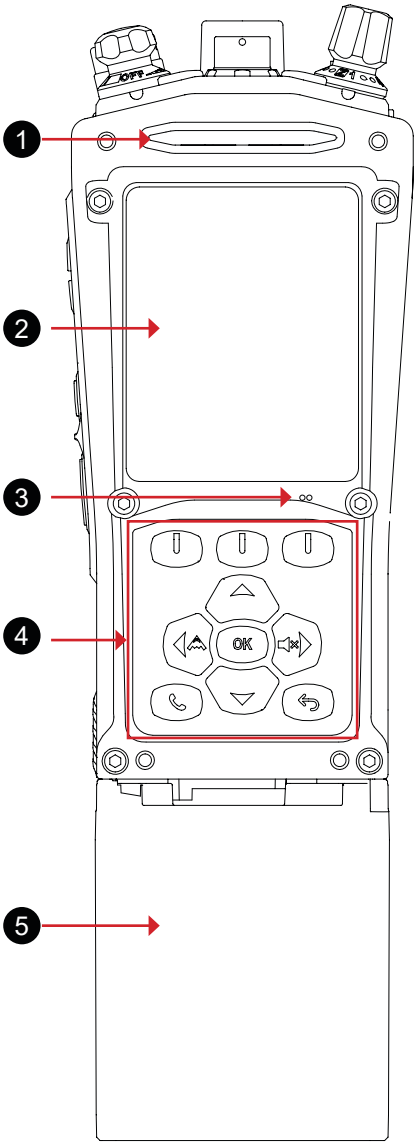
Once the battery is connected, turn the ON/Off/Volume switch clockwise to turn on transceiver.



To turn off, hold down and turn the switch anti-clockwise until switch is in the OFF position.

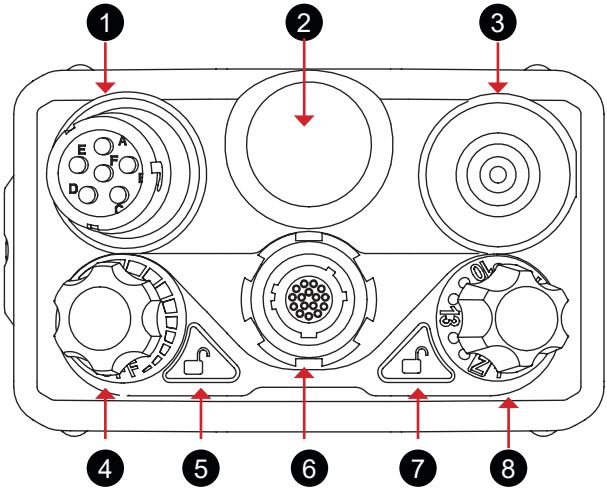
Transceiver overview

PRC-4080 - front



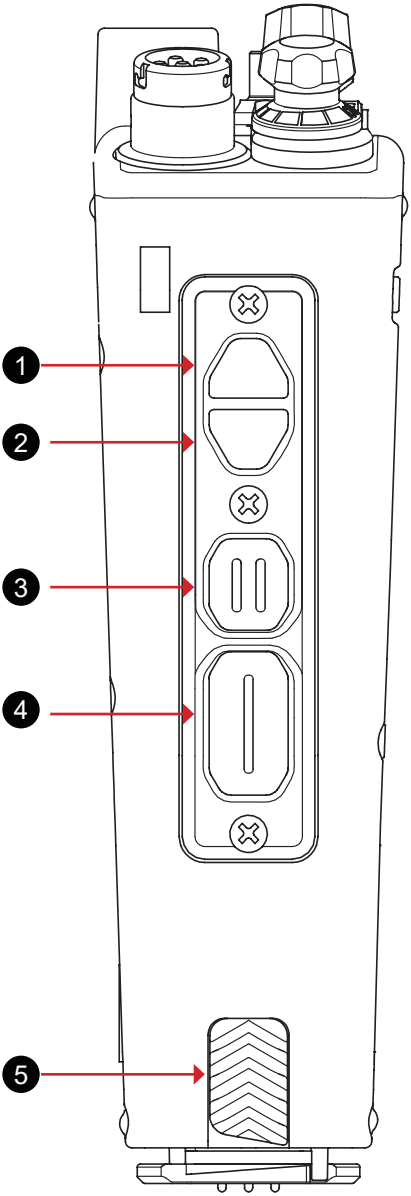
Reference	Description
1	Speaker
2	Screen
3	Microphone
4	Keypad
5	Battery

PRC-4080 - top



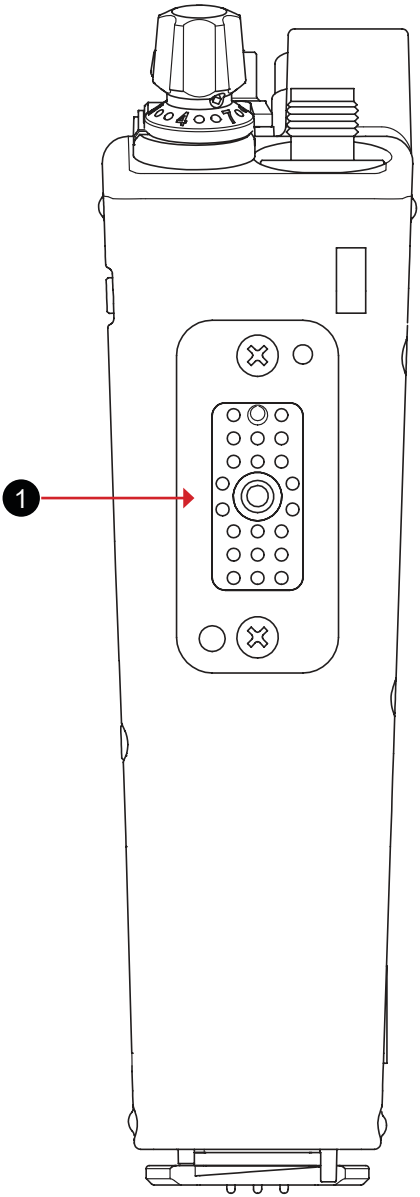
Reference	Description
1	H250 Handset connection
2	GPS connection
3	Antenna/RF connection
4	On/Off/Volume rotary switch
5	Unlock key for On/Off/Volume switch
6	ODU connection for Secure Fill Device programming
7	Unlock key for Preset/Zeroise switch
8	Preset/Zeroise rotary switch

PRC-4080 - left side



Reference	Description
1	Secondary Net select
2	Primary Net select
3	Secondary Net PTT
4	Primary net PTT
5	Battery release mechanism

PRC-4080 - right side



Reference	Description
1	Hotshoe connection

Keypad

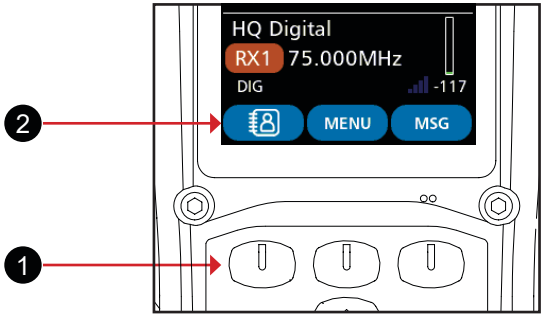
There are ten keys on the keypad. Some keys have multiple functions assigned.

Key	Function
	Soft key - function is determined by corresponding label on screen.
	Scroll down
	Scroll up
OK	Enter / OK / Select

Key	Function
	Scroll left / Stealth Mode
	Scroll right / Mute
	Call menu shortcut
	Back one screen / return

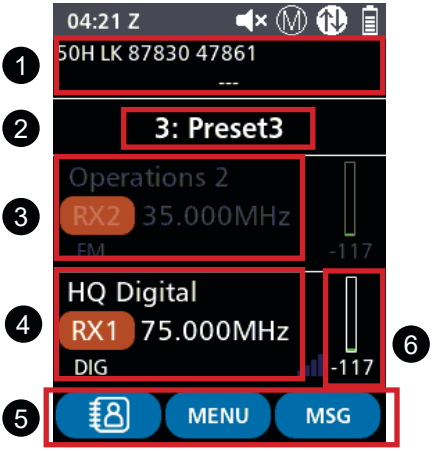
Softkeys

Softkeys are the physical form of on-screen functions. As these functions change, the physical button remains the same. In this manual, the functions will be represented as they appear on screen e.g. MENU, though the physical button will be pressed by the operator.



Reference	Description
1	Physical button
2	On-screen function

Display



Reference	Description
1	GPS coordinates
2	Preset name
3	Secondary net in inactive state
4	Primary net in active state
5	Softkey functions
6	Signal Strength indicator

Status indicators


Battery charge level


Internal module fitted and ready


Warning


System Log recording


Stealth Mode active


GPS position active


Fill Device Connected


Missed Call


Unread Message


Global Mute override active

Basic operation 2

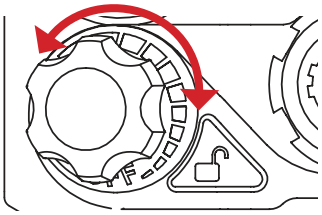
This chapter contains the following sections:

- Adjusting the Volume
- Selecting a Preset
- Zeroise
- Making a Voice Call
- Dual Receive Nets
- Squelch/Mute
- Stealth mode

Adjusting the volume

To increase the volume of either the main speaker or the (H250 Handset if connected), turn the on/off switch clockwise to the desired volume.

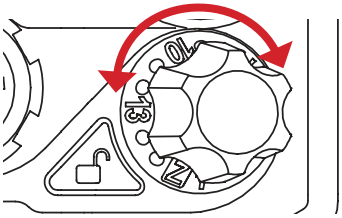
Turn anti-clockwise to reduce the volume. The lowest volume setting is mute.



Selecting a preset

Turn the Preset switch clockwise or anti clockwise to select a preset. Each of the presets will display on the screen as the switch is turned.

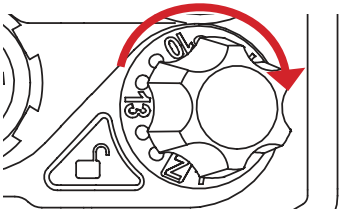
Note: The switch will not pass through the 'Z' label on the switch.

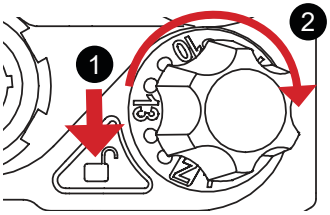


Zeroise

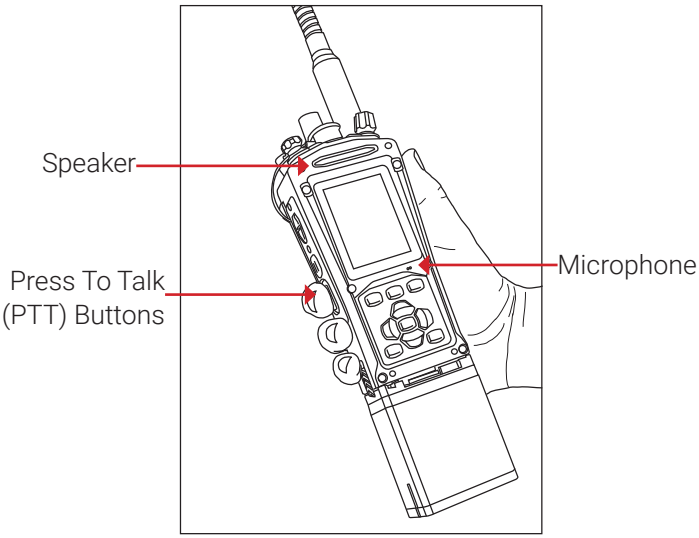
To zeroise the transceiver, turn the Preset switch all the way around anti-clockwise, until it can't turn any further. Then, hold down and turn the switch one notch further so that the 'Z' is selected.

For Zeroise behaviours, see page 58.





Making a voice call



When Using the Microphone:

1. Press and hold the PTT (transmit) button only while talking
2. Position the microphone close to your mouth
3. Speak clearly
4. Use the word ”over” to indicate that you have finished speaking, and then release the PTT (transmit) button

Note:

- The Barrett PRC-4080 has a transmit time-out facility. This facility (when programmed) allows the transmitter to be keyed in transmit mode with the PTT (transmit) switch for a set time period, after which the transceiver switches to receive until the PTT (transmit button) is released and re-keyed. Enabling, disabling and changing the time of the transmit timeout facility can be set either when programming the transceiver or in the RF Section of the Settings menu. See page 56.

Dual receive presets

The PRC-4080 has dual receiver functionality which allows it to receive on two frequencies (or nets) at once.

When the primary net is selected (as shown opposite, the audio heard from the speaker will be from the selected net.

However, if the primary net is selected but a call or message is received on the secondary net, the transceiver will automatically switch to the secondary net.

Switching between the primary and secondary nets can be manually set by using the up and down navigational buttons on the side of the transceiver or the up and down keys on the keypad.

Transmission on the primary or secondary net is also seamless. Pressing the larger PTT button with the single raised bar will transmit over the primary net. Pressing the smaller PTT button with two raised bars will transmit over the secondary net. If only one net is set, both PTT buttons will transmit over the same net.

For more information on nets, see page 43.

Note: Digital Voice or Frequency Hopping nets can only be in the primary net position.

Dual AM nets should require Squelch to be enabled on both nets for accurate channel switching.

Squelch/mutes

Mute or squelch limits the background noise heard through the speaker. They will, however allow calls and messages through.

There are two ways to enable squelch on a net:

- From the home screen, Press OK and navigate down to Squelch. Press OK to change the setting from Disabled to Enabled. Press

, then SAVE, or

- From the Home screen, press MENU navigate to Nets, and press OK on the desired Net and navigate down to Squelch. Press OK to change the setting from Disabled to Enabled. Press SAVE and then YES to confirm changes.

This setting can now be toggled on/off by pressing and holding .

For use on an FM channel a squelch code can be set. For more information on squelch codes, see page 75.

Stealth mode

Pressing and holding will toggle Stealth Mode (if enabled). This is a customisable mode incorporating whisper mode and the option to limit all backlights and audio outputs.

For Stealth Mode settings, see page 59.

Rx scroll

Pressing and holding will bring up the Rx Scroll feature. It allows a user to temporarily monitor a specific frequency without changing the net frequency.

Use the arrow keys to select a frequency. The left and right arrow keys change which digit is highlighted and The up and down keys change the value of the highlighted digit.

RST resets the number back to the net value.

Calling and messaging 3

This chapter contains the following sections:

- Overview
- Call Types
- Send/Receive process
- Message Types
- Send/Receive Process
- Broadcast calls and Messages
- Calling by ID
- Message History

Overview

This chapter covers selective calling and messaging options and must be purchased separately to the transceiver.

All of the calls and messages transmitted by the PRC-4080 use Selcall protocols as their form of transmission.

There are several different Selective Calls available in addition to simple point-to-point VHF communications.

For ease of use, the PRC-4080 separates the Selcall types into two: Calls and Messages.

Calls are located under  :

- Selcall
- Private Call
- Legacy Call (Selcall to a Legacy contact)

Message-type calls are located under 

:

- Preset Messages
- Text Messages
- GPS Request
- GPS Send
- OTAZ

The availability of these call types varies with Net modes. This is outlined below.

Call/MSG type	AM	FM	DV	SSB	FH
Selcall		X			X
Private Call		X	X		X
Legacy Call		X			
Preset Message		X	X		X

Call/MSG type	AM	FM	DV	SSB	FH
Text Message		X	X		X
GPS Send		X	X		X
GPS Request		X	X		X
OTAZ		X	X		X
Broadcast calls		X			X
Broadcast messages		X	X		X

Call types

Selcall

This call type is used to hail another station or stations, the receiving station will alert the operator that a call has been received.

Private call

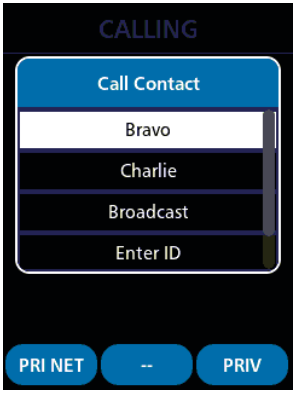
This Selcall changes the squelch code used by the called and calling stations, so that other stations in the network do not open squelch or un-mute the audio. This call is unencrypted.

Legacy call

This is a call used only for backwards compatibility with Barrett PRC-2080+ transceivers. This call is a Selcall that can only be sent to contacts with Legacy Call enabled. See page 40.

Send/receive process

Selcall/legacy call



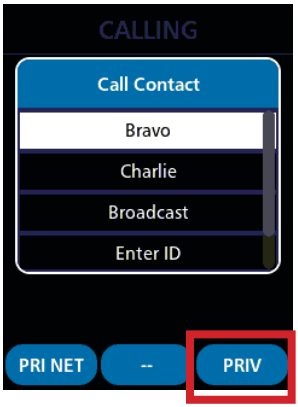
Sending a selcall

1. Select a Net to transmit over.
2. Press  or  , then Calling.
3. Select a contact and press  . This will alarm on the receiving transceiver.

Receiving a selcall

When a Selcall is received, a pop-up will appear on the screen with the sender's name or Selcall ID. An audible alarm will also sound until the pop-up is acknowledged. Using the appropriate PTT button, speak into the transceiver as normal.

Private call



Sending a private call

1. Select a Net to transmit over.
2. Press  or  , then Calling.
3. Press  , then select a contact and press  . This will alarm on the receiving transceiver.

Receiving a private call

When a Private Call is received, a pop-up will appear on the screen with the sender's contact. An audible alarm will also sound until the pop-up is disabled. Using the appropriate PTT button, speak into the radio as normal.

Message-type calls

Note: Message-type calls cannot be sent to Legacy contacts.

Preset message

Will send a Preset Message template. This can be up to 250 characters long and can be edited before sending using the on screen keyboard.

Text message

Text allows messages of up to 250 characters that must be entered from the on screen keyboard.

GPS request

Use this option to request a remote station's GPS position. Information from the remote station will be the latest GPS position of the station, as long as they have a valid GPS reading. The GPS Request displays the GPS coordinates of the remote station's position as well as the bearing of and distance from the sender.

GPS send

Use this option to send your GPS position to another station.

Note: a GPS receiver must be connected and receiving position information when using the GPS call option.

OTAZ

Over The Air Zeroise. This message type instigates Zeroise behaviour on the receiving transceiver. This behaviour is defined by the Zeroise setting of the sending transceiver.

Send/receive process

Preset message

Sending a preset message

1. Select a Net to transmit over.
2. Press MSG or MENU, then Messaging.
3. Select a contact from the list and then press OK.
4. Press OK to select Preset Message, then select a preset message (these are set in the 4000 series VHF programming software).
5. Press OK or SEND.
6. If sent successfully, 'Message Delivered' text should briefly appear in place of the Preset name on the home screen.

Receiving a preset message

When a Preset Message is received, a pop-up titled "Text Msg Received" will appear that displays the sent message. The audio alarm will also sound until the message is acknowledged or will time out after 60 seconds.

Text message

Sending a text message

1. Select a Net to transmit over.
2. Press MSG or MENU, then Messaging.
3. Select a contact from the list and then press OK.

4. Select Text Message and press OK or SEND.
5. Use the navigation and OK keys to enter a message. Use ↩ to return to the previous step. This will delete all message progress.
6. Press ENT to send the message.

Receiving a text message

When a Text Message is received, a pop-up titled “Text Msg Received” will appear that displays the sent message. The audio alarm will also sound until the message is acknowledged or will time out after 60 seconds.

GPS request

Sending a GPS request

1. Select a Net to transmit over.
2. Press MSG or MENU, then Messaging.
3. Select a contact from the list and then press OK.
4. Select GPS Request and press OK.

Receiving a GPS request

How a GPS Request is received depends on the Position Req Response setting found in MENU - Settings - Messaging. If this setting is set to Auto, the transceiver will automatically send its position to the requester - without any operator involvement. If this setting is set to Manual, when a GPS Request is received, the operator must manually respond with the GPS position by

either sending a GPS Send or pressing SEND when the GPS Request pop-up is received.

GPS send

Sending a GPS send

1. Select a Net to transmit over.
2. Press MSG or MENU, then Messaging.
3. Select a contact from the list and then press OK.
4. Select GPS Send and press OK.

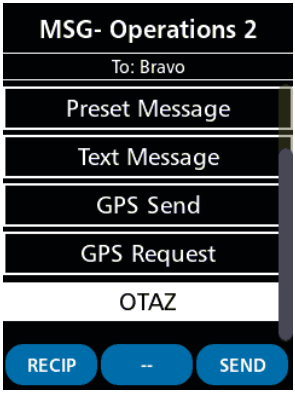
Receiving a GPS send

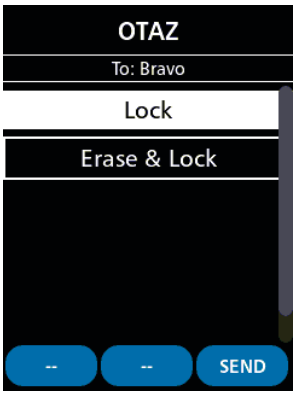
When a GPS Send is received, a pop-up with the latitude and longitude of the sender as well as their distance and bearing from the receiver (if both transceivers are fitted with GPS receivers). The audio alarm will also sound.

OTAZ

Sending an OTAZ

1. Select a Net to transmit over.
2. Press MSG or MENU, then Messaging.
3. Select a contact from the list and then press OK.
4. Select OTAZ and then a behaviour type. Press OK or SEND.
5. Enter the OTAZ PIN of the remote transceiver and press SEND.



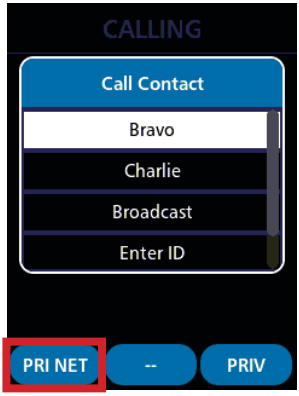


6. Confirm OTAZ with YES.
7. OTAZ will transmit.

Receiving an OTAZ

No warning will be given when an OTAZ is received. The radio will reboot & apply the selected OTAZ behaviours.

Calling or messaging on a dual receive preset

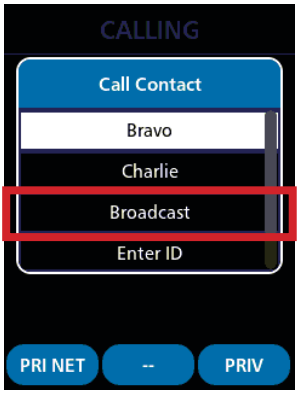


When calling or messaging on a Dual Receive Preset, before selecting a contact, it is possible to change the transmission net.

Pressing PRI NET will send the message/make the call on the primary net.

Pressing SEC NET will send the message/make the call on the secondary net.

Broadcast calls and messages



Sending a broadcast call or message will send the selected call or message frequency-wide. This means that any station on that particular frequency, with a PRC-4080 will receive the message.

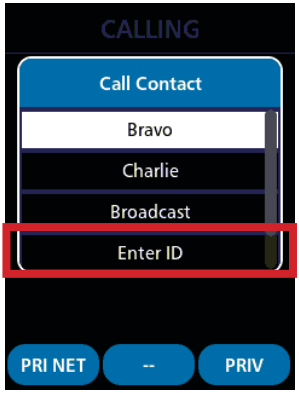
To send a broadcast call, select “Broadcast” from the contact list when sending a call or message.

Note: GPS Request and OTAZ messages cannot be set as a Broadcast.

Calling or messaging by ID

Calls can be made to a transceiver not in the address book.

To send a call by Selcall ID, select “Enter ID” from the contact list when sending a call or message.



Message history

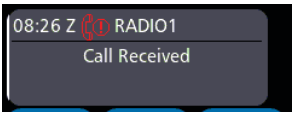
View

Message History can be accessed in two ways:

- Press and hold MSG on the home screen.
- Via MENU - Messaging History menu.

Message History displays all of the sent and received messages by Net within a selected Preset.

In default theme, sent messages are displayed in blue on the right of the screen and the received messages in grey on the left of screen. Unread or missed messages or calls are displayed with a red icon until they have been viewed.

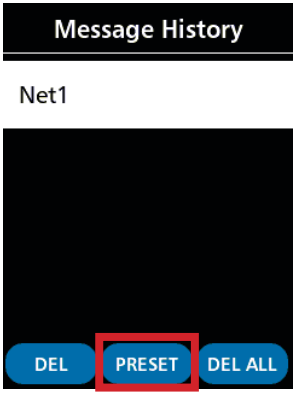


Filter

Message History can be filtered by pressing the centre softkey.

Pressing PRESET will filter the messages by the currently selected preset.

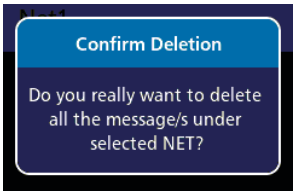
Pressing ALL will show all nets that messages have been received on regardless of preset.



Delete

To clear Message History, enter the Message History menu and select DEL to delete a single message.

Likewise, select DEL ALL to delete the Message History of a selected Net.



Programming 4

It is recommended that all programming be completed via the 4000 Series VHF Programming software however, all programming can also be made via the transceiver interface unless locked by a system administrator.

This chapter contains the following sections:

- Contacts
- Nets
- Presets
- Upgrade/Config Load/Fill device

Contacts

Contacts with assigned call IDs ensure that calls and messages reach the right recipients. Each transceiver in a network should be assigned a 3-digit self-ID in order to identify it from others.

Some notes about Self IDs:

- The Self ID cannot be the same as the call ID of another transceiver contact.
- The self ID can be the same across nets and presets but it cannot overlap with the call ID of any transceiver contact listed in the address book.

Self IDs are assigned to nets and can be found by pressing OK on a selected net or by pressing MENU - Nets and scrolling down to the Self ID.

Contacts can be assigned to multiple nets so that the same call ID can be used across multiple frequencies.

In some scenarios, such as interoperability, it may be necessary to have more than one self ID assigned. In this case, there still cannot be any overlap with the call ID of any transceiver contact listed in the address book.

The Contacts menu can be reached in two ways:

- Press  from the home screen, or
- Press MENU. Use the arrow keys to navigate to Contacts and press OK.

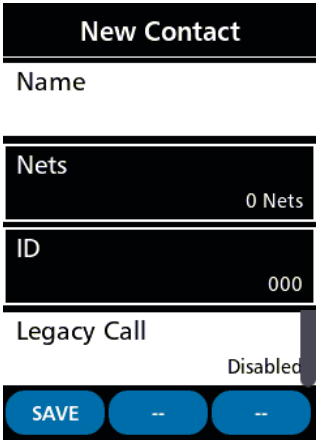
Note:

No contact may have the same call ID as the local transceiver's self ID.

Add new

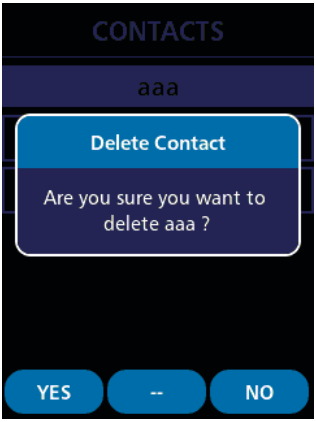
To add a new contact:

1. Navigate to the Contacts menu.



2. Press ⊕.
3. The following menu will open:
4. Use the navigation keys and OK to enter a contact name (up to 32 characters). Press ENT to accept the name as typed.
5. Select one or more Nets from the options using OK to apply this contact to the selected Nets. Press ↩ to accept the selected Nets.
6. Use the arrow keys to enter a call ID. The left and right arrow keys change which digit is highlighted and The up and down keys change the value of the highlighted digit. Press OK to confirm. Press RST to revert to 000.
7. Leave the Legacy setting as Disabled unless interoperability with a Barrett PRC-2080+ is required.
8. Press SAVE to save the contact.

Pressing ↩ will raise a pop-up confirming the choice to discard the contact. Press the corresponding YES or NO as appropriate.

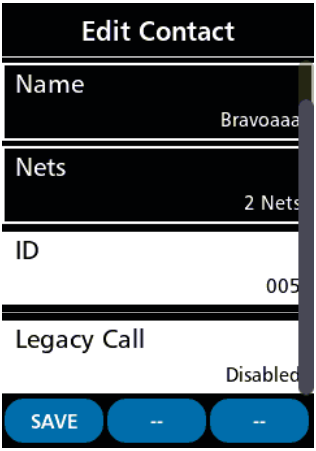


Delete

To delete an existing contact:

1. Navigate to the Contacts menu.
2. Use ▲ and ▼ to select a contact.

3. Press DEL.
4. A pop-up confirming the choice to discard the contact. Press the corresponding YES or NO as appropriate.



Edit

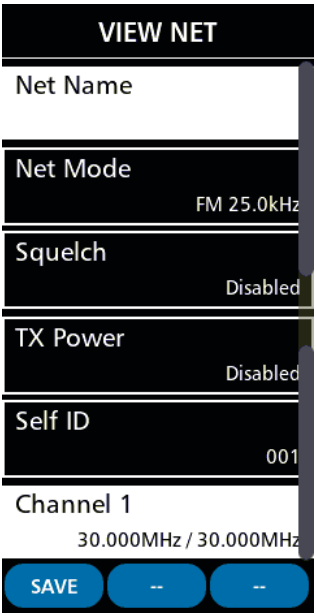
To edit an existing contact:

1. Enter the Contacts menu by pressing either  or entering MENU and selecting Contacts.
2. Use  and  to navigate to a contact and press OK to select it.
3. Select and change the desired settings.
4. Press SAVE to save the changes. Pressing  will raise a pop-up confirming the choice to discard the changes. Press YES or NO as appropriate.

Nets

A net is a collection of settings that includes a transmit and receive frequency, a transceiver ID and a mode amongst other settings. Nets are then assigned to presets.

Add new



To add a new net:

1. Enter the Nets Menu by pressing MENU, navigating to Nets and pressing OK.
2. Press ⊕. The menu opposite displays:
3. Enter a new Net Name with the navigation and OK. Press ENT to confirm the entry.
4. Select the mode type for the Net and press OK to confirm.
5. Press OK to select either enable or disable Squelch.
6. Press OK to select the transmit power for the Net. 5W by default setting.
7. Use the arrow keys to enter a Self ID. The left and right arrow keys change which digit is highlighted and The up and down keys change the value of the highlighted digit. Press OK to confirm. Press RST to revert to 000. Note: This ID cannot be the same as any contact in the address book.
8. Press OK to select Channel 1 and then RX or TX Frequency.

Use the arrow keys to enter a channel frequency. The left and right arrow keys change which digit is highlighted and The up and down keys change the value of the highlighted digit and then press OK. Press RST to revert to 30MHz.

- Pressing SYNC TX will synchronise the TX frequency with the RX frequency.
- Pressing SYNC RX will synchronise the RX frequency with the TX frequency.

9. Press ↩ and then SAVE to add the net to the Net List.

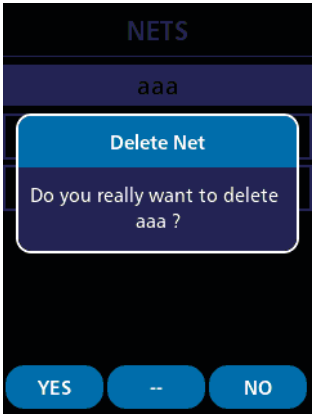
Net mode

There are seven modes available for nets. Only one may be selected per net.

AM 8.33kHz	8330Hz filter bandwidth. Single frequency transmission only. Messaging & Calling not supported. Squelch operates on voice detect.
AM 25.0kHz	25000Hz filter bandwidth. Single frequency transmission only. Messaging & Calling not supported. Squelch operates on voice detect.
FM 12.5kHz	12500Hz filter bandwidth. Single frequency transmission only. Messaging & Calling supported. Squelch operates using CTCSS.
FM 25.0kHz	25000Hz filter bandwidth. Single frequency transmission only. Messaging & Calling supported. Squelch operates using CTCSS.
Digital Voice	Requires installed DV or SDV module. Variable data rate. Channel scanning supported. Messaging & Calling supported. Squelch operates using voice detect.
SSB	Unmodulated signal. Single frequency transmission only. Messaging & Calling not supported. No squelch supported.

Frequency Hopping	Proprietary hopping algorithm. Single frequency transmission only. Messaging & Calling supported. Hopping range, rate & key configurable. Squelch operates using CTCSS.

Delete

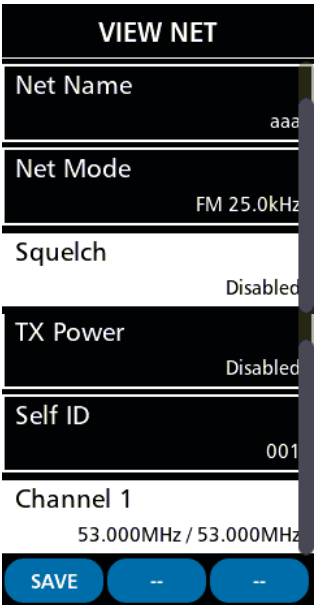


When a net is deleted, it is removed from all associated presets as well as the Net list.

To delete a net:

1. Press MENU from the home screen, navigate to Nets.
2. Select a Net and press DEL.
3. Confirm deletion by pressing the YES, or use NO or ↩ to cancel.

Edit



Any existing net can be edited in two ways.

- By pressing OK on the current net.
- By selecting MENU from the home screen and entering the Nets menu.

Press SAVE to save the net. Pressing ↩ will raise a pop-up confirming the choice to discard the net changes. Press YES or NO as appropriate.

Note: Some changes may not be compatible with a transceiver's current preset configuration.

Presets

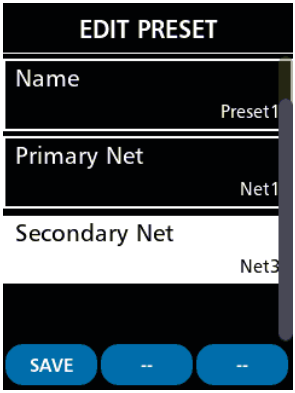
Note: Presets can only be programmed with pre-existing nets. A net must be created before it can be added to a preset.

Notes on assigning nets to presets:

- A preset may have zero, one or two nets set to it.
- A preset will be deemed invalid if it has only a secondary net assigned.
- Nets utilising Frequency Hopping or Digital Voice can only be set as a primary net.

Edit

To add nets to a preset or edit an existing preset:

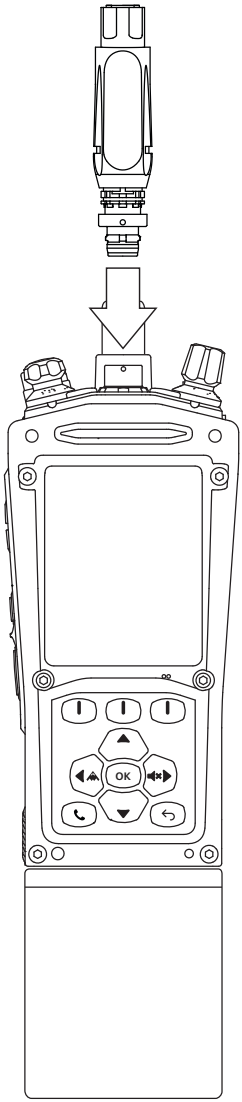


1. Press MENU and use ▲ and ▼ to navigate to the Preset Menu. Press OK.
2. Select the Name field and use the navigation keys and OK to edit the Preset name. Press ENT to confirm the entry.
3. To add a Primary Net, select the Primary Net field, press OK and any existing net can be selected and applied by pressing OK.
4. To add an optional Secondary Net, press OK and any existing Net can be selected and applied by pressing OK.
5. Press SAVE to save the preset. Pressing ↩ will raise a pop-up confirming the choice to discard the preset changes. Press YES or NO as appropriate.

The changes or additions will now be present on the corresponding preset when selected via the Preset switch.

Upgrade/config load/fill device

Fill device attachment



Attaching the Fill Device to the ODU connector on the top of the transceiver will automatically bring up the Fill Device menu.

This menu can also be accessed manually via MENU and using the up/down keys to navigate to Fill Menu.

From this menu, it is possible to load configuration pack, master keys, update the system, update the Internal Module and export the current pack.

Note: Not all of these line items will be available for all users.

Please refer to the 4000 Series VHF Programming Software Manual for details on Configuration pack creation.

Export

Pressing EXPORT while a fill device is connected will allow the current configuration pack, system log and other data to be exported.

1. Connect the Secure Fill Device to the ODU connector on the top of the transceiver.
2. When the Fill Device pop-up appears, press EXPORT.
3. The export process will begin automatically and the pack will be saved as 4080-export.vhfpack. If more than one pack has been exported to the same Fill

Device, the file names will automatically add the next consecutive digit to the file name.

4. The Fill Device can now be removed.

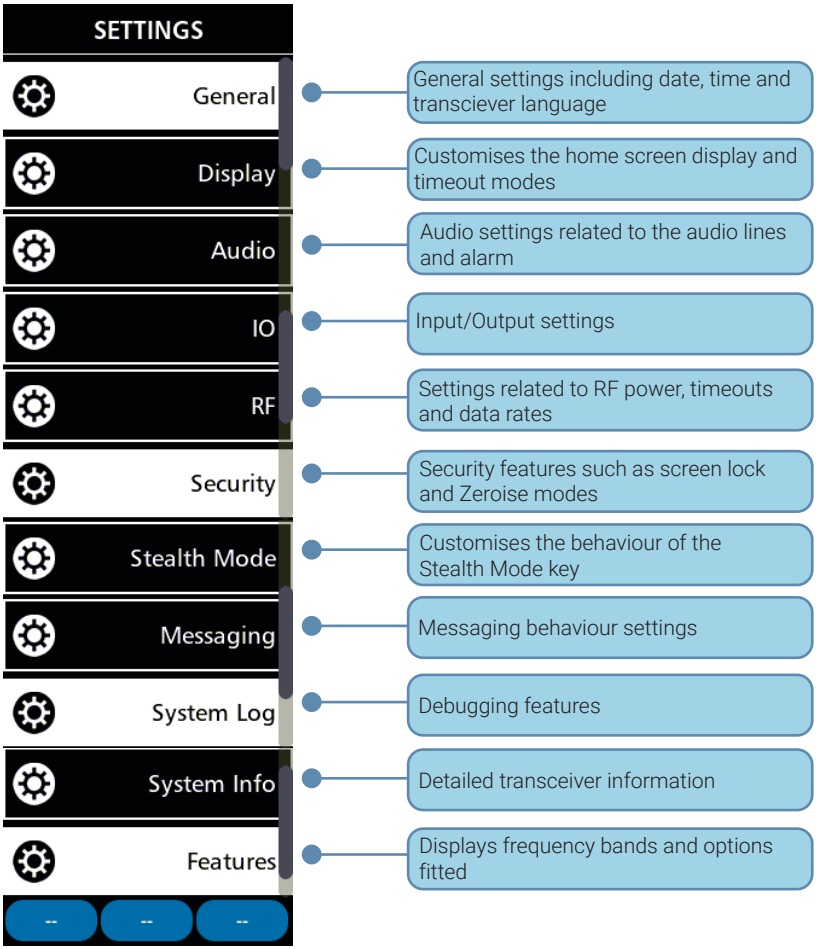
Settings 5

This chapter contains the following sections:

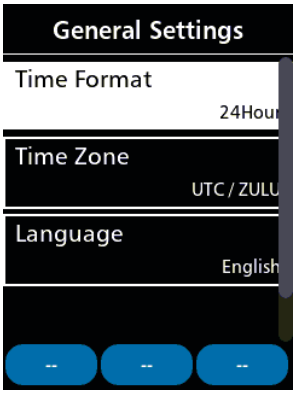
- General
- Display
- Audio Settings
- IO Settings
- RF Settings
- Security Settings
- Stealth mode
- Messaging
- System log
- System info

Settings can be accessed by pressing MENU on the home screen and then navigating to Settings.

All settings may not be available to the end user as they may be locked by a system administrator.



General settings



Time format

Toggles the time format displayed on the screen between 12 or 24 hour formats.

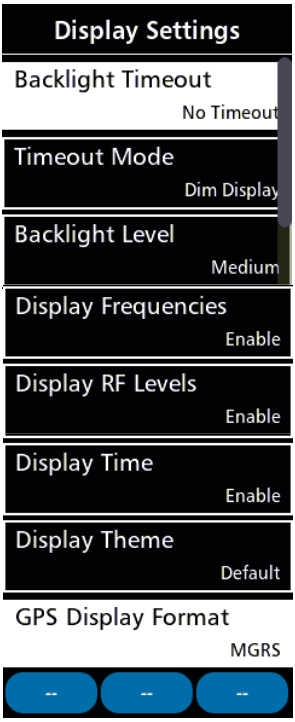
Time zone

This changes the time zone of the display time. Select from GMT/ZULU or another time zone.

Language

The display language of the transceiver. This can be set to English, French, Arabic, Spanish, Russian or Chinese.

Display



Backlight timeout

Length of time before the Display Timeout Behaviour activates.

Set to No Timeout, 60 Seconds or 180 Seconds.

Timeout mode

Behaviour of the screen activated when the backlight times out.

Set to either Dim Display, Display Off, or Screen Saver.

Backlight level

Adjusts the brightness of the screen.

Set to Very Low, Low, Medium, High, or Very High.

Display frequencies

Sets whether the frequency of a net is displayed on screen.

Select either Enable or Disable.

If enabled, the frequencies of a net ***will*** be displayed on the home screen.

Display RF levels

Sets whether the RF level values are displayed on screen.

Select Enable or Disable.

If enabled, the RF Level values *will* be displayed on the home screen.

Display time

Sets whether the time in UTC/Zulu displays on the home screen.

Select either Enable or Disable.

Display theme

Changes the colour theming of the display.

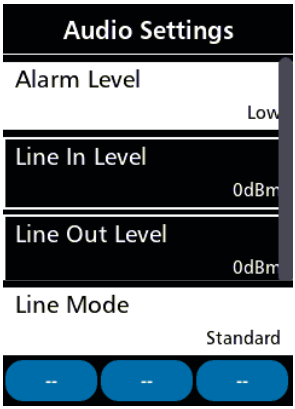
Select from Default, Green on Black, or Red on Black.

Display GPS format

This setting changes the format that the GPS reading is displayed in.

Select from Degree Minutes, MGRS and UTM.

Audio settings



Alarm level

Volume control for the incoming audio alarm.

Set to Off, Low, Medium, or High.

Line in level

This setting adjusts the input level sensitivity of the auxiliary 600 ohm balanced audio input.

Line out level

This setting adjusts the output level of the auxiliary 600 ohm balanced audio output port.

Line mode

There are four modes for this setting and sets audio routing. Each setting is outlined as follows:

Standard: The default mode for the PRC-4080 handheld.

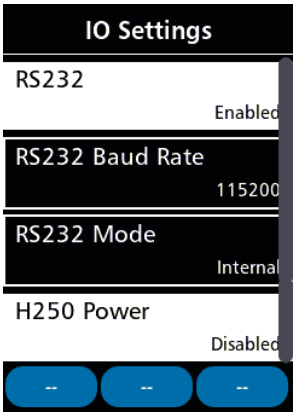
External Modem: used when an external modem, vocoder, scrambler or other high assurance type device is connected via hot-shoe connection.

External Speaker: For use with the Barrett supplied external powered speaker in mobile and base station configurations.

Intercom: For use when the transceiver is connected to an in-vehicle intercom system.

IO settings

Please note the 4080 IO Breakout Box cable (P/N 4080-04-06) is required for RS232 functionality.



RS232

This setting enables or disables serial communications via side hotshoe connection. Enabled or Disabled.

RS232 baud rate

This menu option allows the selection of the RS232 Baud rate.

The Baud rate setting is dependent on the external device/application connected to the transceiver.

Can be set to 115200 or 9600.

RS232 mode

Internal: routes the hotshoe serial port to the radio's default serial terminal.

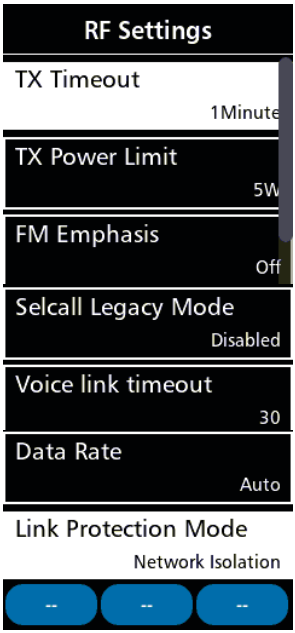
Module: routes the hotshoe directly to the internal module. For advanced users.

H250 power

Manually sets the power to the H250 handset connector. This is designed to be used with the Mobile and Base Station configurations.

Sets to Enabled or Disabled.

RF settings



TX timeout

When this feature is enabled, the transceiver will stop transmitting if the PTT button is held on for more than the allowed time limit Ok. if the handset is accidentally wedged under a seat. Releasing the PTT button will re-enable transmission.

Can be set to Disabled, 1 minute, 2 minutes or 3 minutes.

TX power limit

This section sets the global RF power output for all channels in the transceiver. Can be set to TX Disabled, 500mW, 1 W, 2.5W or 5W.

FM emphasis

A subjective audio setting for FM channels that changes the emphasis levels on FM voice audio.

Can be set to On or Off.

Selcall legacy mode

Allows interoperability with legacy Barrett PRC-2080+ transceivers. This is the global setting and must also be enabled within each contact (- Edit Contact - Legacy Call - Enabled/Disabled) in order to be implemented.

Sets to Enabled or Disabled.

Voice link timeout

The time in seconds after inactivity that the transceiver will automatically terminate a link. Set between 0 and 3600. Default is 30 seconds. This setting only applies to Digital Voice nets.

Data rate

Data rate allows you to lock the digital baud rate for message transmission. The default is set to AUTO, where the internal module will automatically negotiate the best rate possible. This setting only applies to Digital Voice nets.

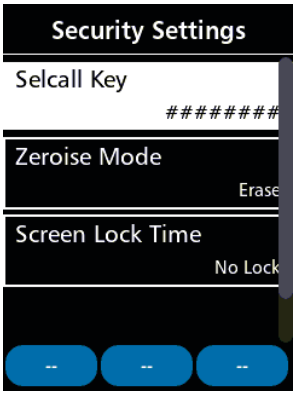
Link protection mode

There are three levels of link protection:

- Disabled: offers no additional link protection.
- Network: serves to isolate the network from another using the network number to scramble the linking process. Required setting for backwards compatibility.
- Normal: scrambles the linking process using the Called network number, Link Protection key, date, Code delivery interval (CVI) and the frequency.

Every transceiver in a network must have the same Link Protection settings in order to communicate successfully. This setting only applies to Digital Voice nets.

Security settings



Selcall key

This 8-digit key is used to encrypt Selcall data. It takes effect across nets and presets.

Zeroise mode

Zeroise setting sets the behaviour for performing a Zeroise on the local transceiver using the Preset/Zeroise switch.

There are three modes for Zeroise:

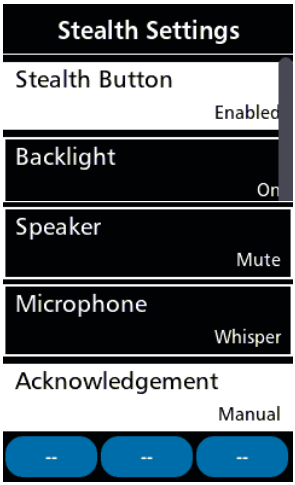
- Erase: Will erase the configuration of the transceiver including all nets, contacts, settings and message history.
- Lockdown: Will lock the transceiver and will prompt for a PIN on boot up. This PIN must be set in the programming software.
- Disabled: No changes will occur to the transceiver, even if an OTAZ call is received or a manual Zeroise is initiated.

Screen lock time

Sets how much time must pass before the transceiver locks the screen. The options are: No lock, 2, 5 or 10 minutes.

Note: This setting must be enabled for OTAZ (Lock) calls to operate properly.

Stealth mode



Stealth button

Enables or disables the stealth mode key. Select Enable or Disable.

Backlight

Sets if the backlight remains active when in stealth mode. Set to either On or Off. If set to On, the stealth mode icon will appear on the home screen.

Speaker

Sets whether audio will be heard through the speaker when in stealth mode. Set to either Mute or Normal.

Microphone

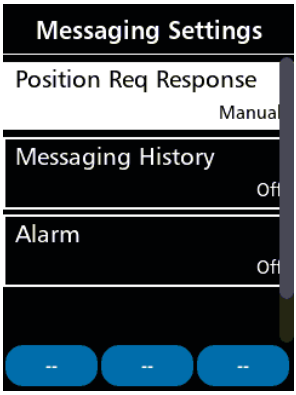
Sets the microphone to whisper mode or normal. In whisper mode the sensitivity of the microphone is increased.

Acknowledgement

Sets the call/message acknowledgement transmission to be either manual or automatic.

Note: If set to manual, Digital Voice is disabled.

Messaging



Position req response

Sets whether the user must manually send position information or if the transceiver will respond automatically.

Set to Manual or Auto response.

Messaging history

Sets whether messages and calls are recorded in the Call History.

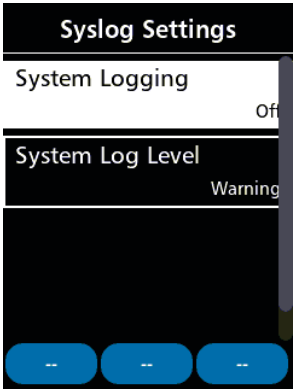
Set to On or Off.

Alarm

Sets whether an alarm is sounded when a message is received. It is set to 'On' by default.

Set to On or Off.

System log



System Logs are not accessible by the user and are required to be sent back to Barrett Communications for decoding. The syslog can be exported with the configuration pack. Please see page 47 for export information.

Note: this function significantly decreases processing speeds, so it is to be used at the user's discretion.

System logging

Sets whether system logging is enabled or disabled. If enabled the syslog icon will appear in the header of the home screen.

System log level

The SysLog can be set to record two types of errors. Choose either:

- Warning: non-critical errors
- Error: critical errors

System info

The following settings are all “view only” but give helpful information which may be required by system administrators:

System Access

Firmware Version

Firmware Build Date

Firmware Git Hash

Hardware Revision

Bootloader Version

Bootloader Build Date

Bootloader Git Hash

Module FW Version

Serial Number

MMC Key

Distribution Key

Calibrations

ADMIN pin

This PIN is for administrator use and provides access to all locked menus in the transceiver. Menus can be locked for various reasons including security and ease of use from the 4000 Series VHF Programming Software.

Encryption & digital voice 6

Features

Features are purchased in addition to the PRC-4080 and may be restricted in some regions.

The following Features can be viewed (if purchased and installed) by pressing MENU from the home screen, navigating to Settings and then Features:

- Frequency Hopping
- Frequency Bands: AM Band, FM Band, SDV Band
- Digital Voice

Each of these are detailed further in this chapter.

Frequency hopping

This option requires an Export Permit and must be purchased in addition to the PRC-4080 transceiver (option P/N 4080-01-01).

Frequency hopping can be used to limit performance degradation due to interference and to reduce the likelihood of interception. The transceiver employs a unique frequency hopping system that uses an external GPS.

Important Notes:

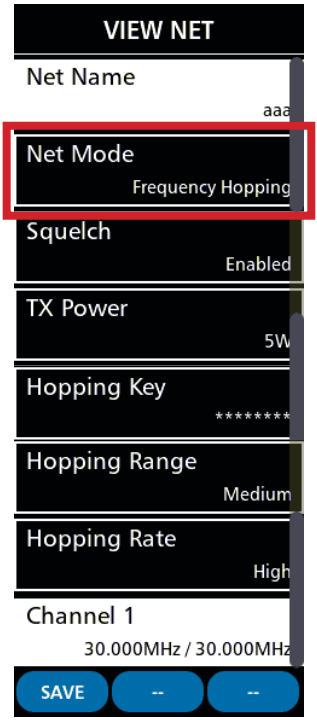
- **An external GPS must be connected and providing valid data for the frequency hopping system to operate.**
- **Only Primary Nets can use Frequency Hopping.**

Nets

If installed, Frequency Hopping can be enabled per net by:

- By pressing OK on the current net or,
- By selecting MENU, entering the Nets menu and selecting a net.

Once in the Net menu:



Net mode

Change the Net Mode type to Frequency Hopping. Press OK. This will open further Net settings.

Freq hopping key

All of the transceivers that will be communicating on the same hopping band will need to have the same 8 digit Hopping key in order to communicate.

This can be set in the 4000 Series VHF Programming Software or manually by pressing MENU, Settings, Security and Freq Hopping Key. This key is not viewable from the transceiver and will view as zeros when the menu is entered.

Freq hopping range

This defines the width of the Frequency Hopping Range - the range over which the frequency will hop around a centre frequency.

This can be set in the 4000 Series VHF Programming Software or manually by pressing MENU, Settings, RF and Freq Hopping Range.

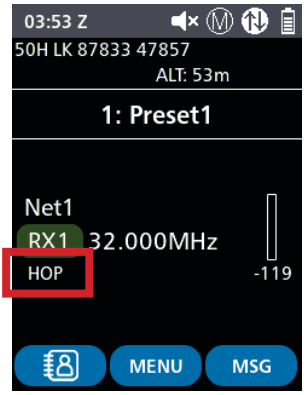
Set to either 1MHz, 2MHz, or 4MHz. The default is 4MHz.

Freq hopping rate

The Frequency Hop Rate is the rate at which the frequency hops between transmission frequencies.

This can be set in the 4000 Series VHF Programming Software or manually by pressing MENU, Settings, RF and Freq Hopping Rate.

Set to Low or High.



Indications

The label 'HOP' will appear below the frequency displayed on the Net.

- HOP flashing: acquiring
- HOP solid: acquired

Frequency bands

Frequency Bands offer access to a restricted set of frequencies applicable to certain types of users as well as transmit power and mode. These may be government regulated and will vary from country to country.

The PRC-4080 supports this by offering a customisable band of frequencies as set by customer requirements.

Digital voice

Encoding can improve the reliability of communications over noisy channels where reception of analogue voice can be poor. Poor voice quality can be improved markedly by the use of digital voice modules to the point where barely usable frequencies are made clear. Secure Digital Voice allows users to encrypt their communications therefore providing a secure VHF network.

Both Digital Voice and Secure Digital Voice can be used with Barrett digital voice modules which are designated as:

DV Digital Voice module with no encryption (P/N 4080-01-43)

SDV-56 Secure Digital Voice module with DES 56 encryption (P/N 4080-01-42)

SDV-256 Secure Digital Voice module with AES 256 encryption (P/N 4080-01-41)

Signal-to-noise ratio conditions can change during communications between stations. The digital voice modules have auto baud capabilities which automatically adjust baud rates up or down whilst communicating between the transceivers allowing the users to transmit and receive signals with optimal voice clarity.

Important Notes for Digital Voice use:

- **Digital Voice nets can only be used as primary nets.**
- **This net type must have at least one valid frequency to save.**
- **Up to 16 frequency channels can be programmed per Digital Voice net.**
- **There is no PTT functionality whilst scanning. Calling should be used to establish a voice link on scanning nets**
- **Mute is enabled by default. Toggled on/off by the global mute override button. Will only open if a valid transmission is received which includes the correct keys and contact information.**

Digital voice nets

Digital Voice nets allow for multiple frequencies to be added to a single net. These will automatically be scanned through, even when the Primary net is not directly selected.

Adding a digital voice net

If installed, Digital Voice can be enabled per net by:

- By pressing OK on the current net or
- By selecting MENU, entering the Nets menu and selecting a net.

Once in the Net menu:

Net mode

Change the Net mode to Digital. Press OK. This will open a further Net setting.

Digital voice key

All communicating transceivers must have the same keys selected in order to communicate.

Select a value up to 256.

Press RST to revert value to 000 (clear digital voice).

Channels

A Digital Voice net can include up to 16 frequencies - or channels. These will be automatically scanned through when the net is on the selected preset.

Use the arrow keys to enter a channel frequency. The left and right arrow keys change which digit is highlighted and The up and

down keys change the value of the highlighted digit and then press OK .Press RST to revert to 30MHz.

- Pressing SYNC TX will synchronise the TX frequency with the RX frequency.
- Pressing SYNC RX will synchronise the RX frequency with the TX frequency.

Repeat until all desired channels have been added.

Keys

Encryption keys for Digital Voice are generated by the 4000 Series Programming software and are loaded via the Secure Fill Device.

Pressing OK while a digital voice net is selected on the home screen and selecting Digital Voice Key will allow the user to change the key being used to transmit.

Indications

The label 'DIG' will appear below the frequency displayed on the Net.

- DIG flashing: acquiring
- DIG solid: acquired

Calls and messages

Calls

If more than one digital voice frequency is programmed into a Digital Voice Net, PTT is disabled from the side PTT button.

To transmit frequency wide, a broadcast call should be used.

To send a broadcast call, select “Broadcast” from the contact list when sending a call or message.

Note: GPS Request and OTAZ messages cannot be set as a Broadcast.

Messages

Messages operate as per other net modes. See page 31.

7 Appendices

This chapter contains the following sections:

Appendix 1 - Specifications

Appendix 2 - CTCSS Squelch codes

Appendix 1 - Specifications

General

Frequency Range	30 MHz to 175 MHz
Supported Modulations	FM (12.5kHz, 25kHz) AM (8.33kHz, 25kHz) Digital modulation (12.5kHz, 25kHz) SSB (25kHz)
Channel Spacing	12.5kHz, 25kHz
Frequency Stability	±0.1PPM with GPS Sync (±0.3PPM unsynced)
Supply Voltage	Handheld: 10.8V Nominal Lithium Ion Battery. 8V to 17V DC Input range.
Power Consumption	RX: 320mA (Typical) TX (5 W): 2.5A (maximum) at 10.8V DC.
Supply Endurance	> 16hrs (8:1:1 idle/RX/TX ratio)
GPS Functionality	SMA connector for GPS antenna. Unit Mounted GPS Antenna for Frequency Synchronization and Blue Force Tracking
Selective calling	Numeric individual and group calls
Frequency Hopping	300 hops/second (maximun)
Mute/Squelch	Tone Squelch: 150 Hz PRC-77 compatible (AFF), CTCSS. Digital Voice squelch: for digital voice modes. Signal Detect Squelch: Analog AM, FM and Frequency modes.
Whisper Mode	+20 dB above nominal input
Contact Capacity	500 contacts
Languages	English, French, Spanish, simplified Chinese, Russian, Arabic.
Digital Voice	600 – 2400bps TWELP/MELPe
Data Modem Option	up to 43.2kbps in 12.5kHz bandwidth

Encryption	DES 56 & AES 256 data and voice encryption
Zeroise/Over Air	Erase, lockdown
MTBF	15k hrs
MTTR	<2 hrs
Audio	Internal speaker and internal microphone

Receiver

Sensitivity	-116dBm for 12dB SINAD – FM Mode -101dBm for 20dB SINAD – AM Mode

Transmitter

Power Output	Four settable levels 5W, 2.5W, 1W, 500 mW nominal (± 20%) (Hand Portable)
Harmonic Suppression	>73dBc (Typical)
Spurious Emission	>73dBc (Typical)

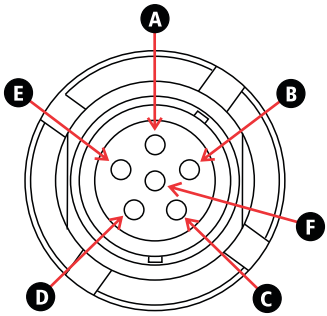
Environmental

Weight	1.05kg (including battery)
Dimensions	80 (W) x 50 (D) x 259 (H) mm, with battery
Display	2.7” Transflective Colour TFT LCD display
Material	Diecast Aluminium, Plastic (PC/ABS)
Colour	NATO Green body with Black Battery
Temperature	Operational Temperature Range: -30C to 60C Storage Temperature (transceiver): -40 to 85C Storage Temperature (battery): -40 to 40C (Recommended) MIL-STD-810H 501.7 High Temperature MIL-STD-810H 502.7 Low Temperature
Humidity	MIL-STD-810H 507.6 Humidity

Immersion	IEC60529 IP67
Salt Fog	MIL-STD-810H 509.7 Salt Fog
Rain	MIL-STD-810H 506.6 Rain
Vibration	MIL-STD-810G 514.6 Vibration
Shock	MIL-STD-810G 516.6 Shock

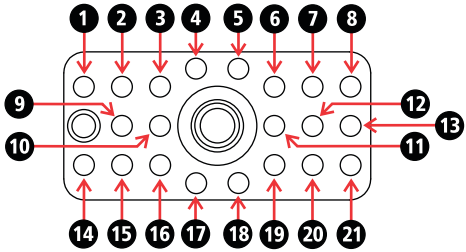
Pin outs

H-250 handset connector



PIN	Signal
A	H250 Handset Ground
B	H250 Speaker output
C	H250 PTT
D	H250 Microphone
E	Reserved
F	+5V

Auxiliary connector



PIN	Signal
1	USB OTG ID - future use
2	Ethernet TX positive - future use
3	Ethernet TX negative - future use
4	Hotshoe PTT In
5	5V BUS Hotshoe
6	Hotshoe Detect
7	Hotshoe RS232 TX Data
8	Hotshoe IO 1 - future use
9	USB OTG Data positive - future use
10	Ethernet RX negative - future use
11	Ground
12	Hotshoe IO 2 - future use
13	Voltage Hotshoe
14	Ground
15	USB OTG Data negative - future use
16	Ethernet RX positive - future use
17	Hotshoe RS232 RX Data
18	Bal. Audio Out negative
19	Bal. Audio Out positive
20	Bal. Audio In negative
21	Bal. Audio In positive

Appendix 2 - CTCSS squelch codes

Squelch codes filter the audio that a transceiver will receive. Instead of producing audio for every event on a channel, the squelch code will filter and open audio for only calls and messages that have the same squelch code as the user.

The following table shows the Squelch codes used by the PRC-4080 and their Hz value. The corresponding Private Line or PL designation has been included for interoperability with other networks.

Squelch Code	Private Line	Hz
1	XZ	67.0
39	WZ	69.3
2	XA	71.9
3	WA	74.4
4	XB	77.0
5	WB	79.7
6	YZ	82.5
7	YA	85.4
8	YB	88.5
9	ZZ	91.5
10	ZA	94.8
11	ZB	97.4
12	1Z	100.0
13	1A	103.5
14	1B	107.2
15	2Z	110.9
16	2A	114.8
17	2B	118.8
18	3Z	123.0
19	3A	127.3
20	3B	131.8
21	4Z	136.5
22	4A	141.3

Squelch Code	Private Line	Hz
23	4B	146.2
NATO		150.0
24	5Z	151.4
25	5A	156.7
40		159.8
26	5B	162.2
41		165.5
27	6Z	167.9
42		171.3
28	6A	173.8
43		177.3
29	6B	179.9
44		183.5
30	7Z	186.2
45		189.9
31	7A	192.8
46		196.6
47		199.5
32	M1	203.5
48	8Z	206.5
33	M2	210.7
34	M3	218.1
35	M4	225.7

Squelch Code	Private Line	Hz
49	9Z	229.1
36	M5	233.6
37	M6	241.8
38	M7	250.3
50	0Z	254.1

Warranty statement

Barrett Communications (hereafter referred to as 'Seller') provides a three (3) year warranty on all Barrett products from the date of shipment from the Seller. A one (1) year warranty from the date of shipment from the Seller is provided for all batteries.

Each warranty guarantees acceptable performance of the product under normal recommended conditions for the duration of the warranty period. In cases of accident, abuse, incorrect installation or maintenance by a non-Seller representative, subjection to abnormal environmental conditions, negligence or use other than those in accordance with instructions issued by the Seller, the warranty shall be voided. In addition, this warranty shall not cover low performance – specifically the distance or quality of transmission and reception - due to unfavourable environmental or locational conditions. Nor shall this warranty cover the quality of transmission and reception of transceivers mounted in vehicles or vessels that have not been sufficiently electrically suppressed.

Should any fault due to bad design, workmanship or materials be proven at any time within the warranty period, the Seller will rectify such fault free of charge provided that the equipment is returned, freight paid, to Barrett Communications Pty Ltd head office or to an authorised service centre. The repaired or replaced product will remain covered under and throughout the term of the original warranty period up to its expiration. No repair or replacement will extend the warranty term past the original thirty-six (36) month anniversary of the original date of shipment from the Seller.

Firmware and software (pre-installed, stand-alone or provided as an update), hereafter referred to as 'Software', is guaranteed to perform acceptably within the specifications provided by the Seller, provided that the Software is within the warranty period.

Should Software not perform acceptably, the Seller will use all commercially reasonable efforts to correct such nonconformity as reported to the Seller directly or via a support representative. The Seller is not obliged to update Software under warranty if the nonconformity is caused by a) the use or operation of the Software in an environment other than intended or recommended by the Seller in relevant documentation, or b) modifications made to the Software not authorised or undertaken by the Seller or a representative of said Seller.

Subject to the matters set out in this warranty, no liability, expressed or implied is accepted for any consequential loss, damage or injury arising as a result of a fault in the equipment and, all expressed or implied warranties as to quality or fitness for any purpose are hereby excluded.

This warranty does not extend to products supplied by the Seller which are not designed or manufactured by it. The Seller will however make every

endeavour to ensure that the purchaser receives full benefit on any warranty given by the original equipment manufacturer.

This warranty is restricted to the original purchaser except where the original purchaser is a reseller authorised by the Seller who has purchased for the purpose of resale, warranty shall be extended to the reseller's customer.

Contact details

Our customer / dealer technical support department can be contacted via land mail, email, telephone or via support ticket on the technical support web page.

https://www.barrettcommunications.com.au/support/

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