

Programming Software Guide

Barrett 4000 series HF Programming Software



BCM40503/08

v1.7.0

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Contents

INTRODUCTION 1	5
Terms and Abbreviations	6
Installation	7
Getting Started	7
Main Screen	8
GENERAL 2	11
Channels	11
Adding a Channel	11
Deleting a Channel.....	11
Editing a Channel.....	12
Channel Labels	14
Add Channel Labels	14
Edit a Channel Label	14
Deleting a Label	14
Scan Tables.....	15
Add a Scan Table.....	15
Adding Channels to the Scan Table.....	15
Configuring a Scan Table.....	15
Deleting a Scan Table	15
Selcall.....	16
Entering a Selcall ID	16
Selcall Networks.....	16
Deleting a Selcall Network	17
Contacts.....	18
Adding a New Contact.....	18
Editing a Contact	18
Deleting a Contact	18
Settings.....	19
Pack Properties.....	19
General	19
Security	20
Scan	21
Mute.....	22
Selcall.....	22
Audio.....	22
RF	24
I/O	24
Display.....	26
Accessory Settings.....	27

Primary/Secondary Control Head.....	27
Break Out Box.....	29
GPS Push.....	30
GPS Push.....	30
Selcall Format.....	30
Preamble Time.....	30
Interval Time.....	30
UTC Offset Time.....	31
Set Privacy Key.....	31
Privacy Key.....	31
Locks.....	32
Frequency Hopping Exclusion Zones.....	33
Adding an Exclusion Zone.....	33
Edit a Frequency Hopping Exclusion Zone.....	33
Deleting an Exclusion Zone.....	33
Free Scroll Tx Exclusion Zones.....	34
Adding an Exclusion Zone.....	34
Edit a Free Scroll Tx Exclusion Zone.....	34
Deleting an Exclusion Zone.....	34
Emergency Call.....	35
Settings.....	35
ALE 2G 3.....	36
ALE 2G Set Up Procedure.....	36
1. Add a Preset Map.....	37
2. Add Addresses.....	37
3. Establish Channel Presets.....	38
4. Add Channel Presets to a Preset Map.....	38
5. Sounding Settings.....	39
6. Setting Up Networks.....	42
7. Preset Messages.....	43
ALE 3G 4.....	44
Addresses.....	44
Pool Entries.....	44
Networks.....	45
Settings.....	45
CALL HISTORY 5.....	48
Call History.....	48

ADDITIONAL FEATURES 6	49
File Menu	49
Tools Menu.....	50
Pack Information.....	50
Pack Validation.....	50
Default Device.....	51
Diagnostics	51
Set Date & Time	51
Reboot	51
System Update.....	51
Warranty Statement.....	52
Contact Details.....	53

INTRODUCTION 1

The Barrett 4000 series HF Programming Software (P/N BCA40001) enables a user to personalise and manage the packs for Barrett 4000 series transceivers. Packs are a collection of settings including, but not limited to, channels, scan tables, Selcall IDs, contacts, general settings and ALE 2G and 3G networks.

Using this software allows the programming of settings not available directly from the transceiver display, such as ALE 2G and ALE 3G settings, unlocking the full capabilities of the transceiver. It must be noted, however, that many of these settings are wholly dependent on the hardware and software options installed on a transceiver. For instance, the programming software can configure a pack with ALE 2G and ALE 3G settings, however, if this pack is then imported to a 4000 series transceiver without the ALE option fitted, the transceiver still not be able to make ALE calls.

This manual is primarily designed for network administrators and personnel overseeing the configuration of HF Networks.

Legislation in some areas may prohibit the use of the programming software. Please consult your Barrett authorised dealer for more information.

Terms and Abbreviations

Term	Description
ALE	Automatic Link Establishment
AM	Amplitude Modulation
AMD	Automatic Message Display
BER	Bit Error Rate
CCIR	Consultative Committee on International Radio standard
CF	Custom Filter
CW	Continuous Wave
GPS	Global Positioning System
HF	High Frequency
INT	International Selcall Format
LAN	Local Area Network
LSB	Lower Side Band
LQA	Link Quality Assessment
LSU	Link Set-Up mode
OEM	Original Equipment Manufacturer
Pack	The collection of settings and channels in a transceiver. Can be modified using the Programming Software.
PC	Personal Computer
PTT	Push To Talk
RFDS	Royal Flying Doctor Service
Rx	Receive
SDR	Software Defined Radio
Selcall	Selective Calling
SINAD	Signal to Noise and Distortion Ratio
SNR	Signal to Noise Ratio
Tx	Transmit
UTC	Coordinated Universal Time
USB	Upper Side Band Universal Serial Bus

Installation

The installer for the Barrett 4000 Series HF Programming Software can be found on the USB storage device provided upon purchase of the software.

The executable program will read:

Barrett 4000 Series HF Programming Software Setup vx.y.z.exe

Follow the on-screen prompts to complete the installation.

It is highly recommended to install the Bonjour app prior to installing the Barrett 4000 Series HF Remote Control app.

1. Download the BonjourPSSetup.exe from:

<https://support.apple.com/kb/DL999>



2. Follow the online instructions to install the Bonjour app.

Note: If Bonjour is not installed, no Barrett transceivers will be linked in the connection screen.

Getting Started

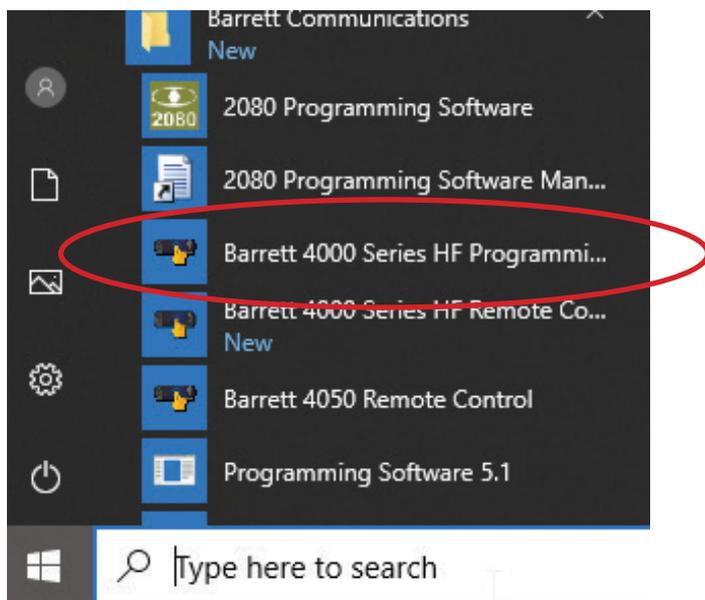
Open the Barrett 4000 Series HF Programming Software application by either:

- Clicking the short-cut from the desktop, or

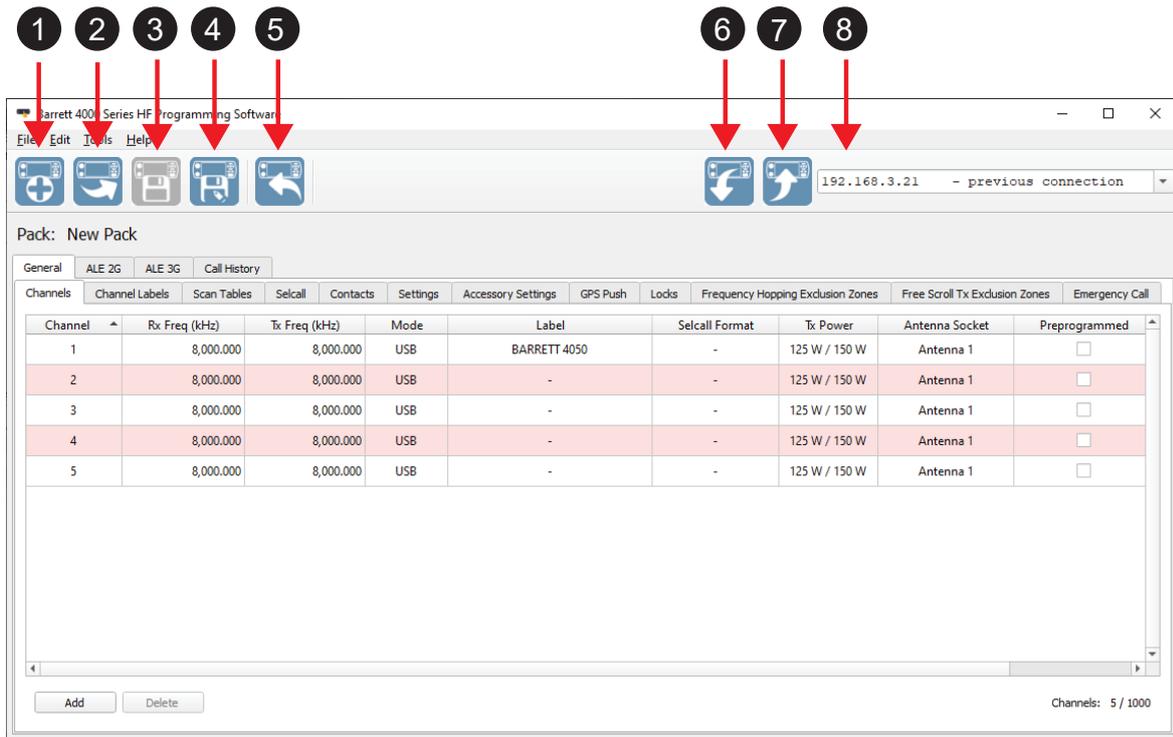


Barrett 4000
Series HF
Programming
Software.exe

- Selecting from the Windows list of programs



Main Screen



- 1 New Pack
- 2 Open Pack
- 3 Save Pack
- 4 Save Pack As
- 5 Undo Last Change
- 6 Get Pack from SDR
- 7 Send Pack to SDR
- 8 SDR IP Address field.
SDRs connected to the same LAN will be automatically listed.

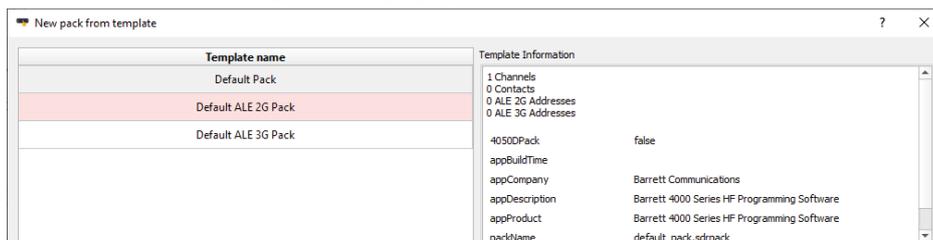
Upon first start-up of the Programming Software you may either:

- Create a new pack from a template, or
- Open and edit an existing pack

Creating a New Pack

A new channel pack is a set of programmable channels and settings that can be transferred to multiple transceivers. Each transceiver will still need to be programmed with individual Selcall ID numbers and ALE addresses. ALE Addresses can only be programmed via the Programming Software.

1. Click  from the tool bar. Choose from the list of templates or open an existing pack. The settings included in the default pack are described on the right of the pop-up.



2. Click  to save the new pack.
Navigate to a directory where the new pack will be saved.
3. Give your new pack a file name, and click **OK**.
4. The Save Encrypted Pack screen displays.
5. Enter a password to save the file with encryption or leave blank to save the file without encryption.

Retrieving an Existing Pack

An existing pack may be retrieved from two locations: a PC or directly from the transceiver.

From a PC

Click the open pack icon  and navigate to a pack. Click Open.

The procedure is the same for opening a pack stored on a USB drive connected to a PC.

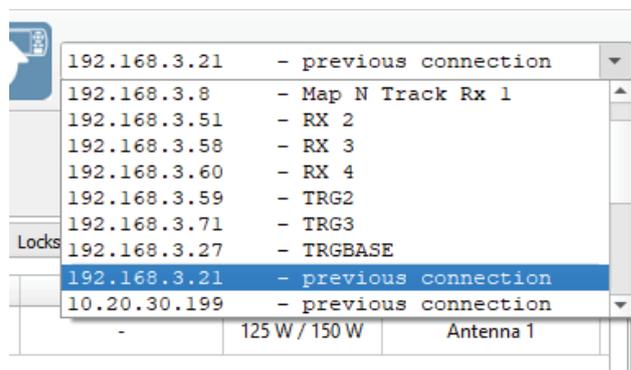
There are two ways to retrieve an existing pack directly from the transceiver:

1. Connecting to the transceiver via Network (if a Barrett WiFi Adaptor is connected, the transceiver will need to be configured as a WiFi Access Point).
2. Via USB

Via Network

If both the transceiver and the PC are connected to the same LAN (see IP Connectivity Guide P/N BCM40507), the transceiver's name should appear in the drop-down menu in the top right hand corner of the programming software window.

The IP address can also be entered manually into this field if the required SDR does not appear in the list.



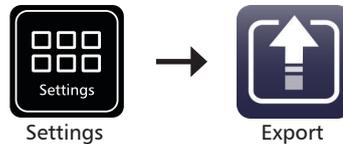
Click  to get (export) and load a pack from the selected SDR.

A "Get Pack from SDR" dialogue box displays showing the progress of the download. When complete, a confirmation message displays. Click **Close**.

The Configuration tabs will now be filled with data from the selected transceiver.

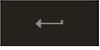
Via USB

1. Insert a USB storage device into the top of the SDR. From the **Settings** Menu, tap **Export**.

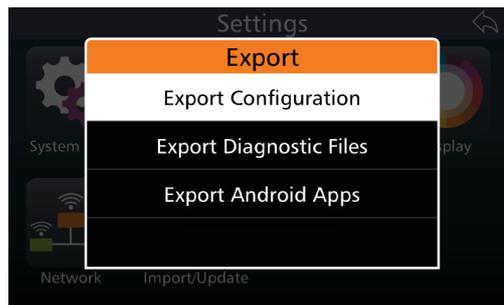


3. From the Export screen, tap **Export Configuration** to display the Configuration File Name screen.

The default name displays. Use the on-screen keyboard to type an alternative name of the configuration file to export to the USB.

Tap  to save.

4. Enter a password for encryption, if necessary.
5. The Export Configuration screen displays showing a progress bar confirming the progress of the export.



When prompted, tap **OK** and remove the USB.

Inserting the USB storage device into a PC loaded with the programming software will allow the pack to be opened from **File<Open**.

The password required is the same as the one set on the transceiver front panel when the pack was exported.

Re-loading a Pack into the Transceiver

Once the pack has been saved using the Save icon shown opposite, the pack can then be uploaded back into the SDR the same way it was retrieved.



Via Network

Make sure the correct transceiver is selected from the drop-down menu in the top right-hand corner of the window, then

click  to send (import) the pack to the transceiver. A message will display, warning that the settings will overwrite the chosen transceiver's settings. Click **Yes** to proceed or **No** to abort.

A "Send Pack to SDR" dialogue box displays showing the progress of the upload. When, complete, a confirmation message displays. Click **Close**.

Via USB

Remove the USB storage device from the PC and insert it into the top or front of the transceiver.

A menu should pop up automatically, allowing the Import Configuration to be selected. If this box does not appear automatically, the pack can be imported via Settings<Import/Update.



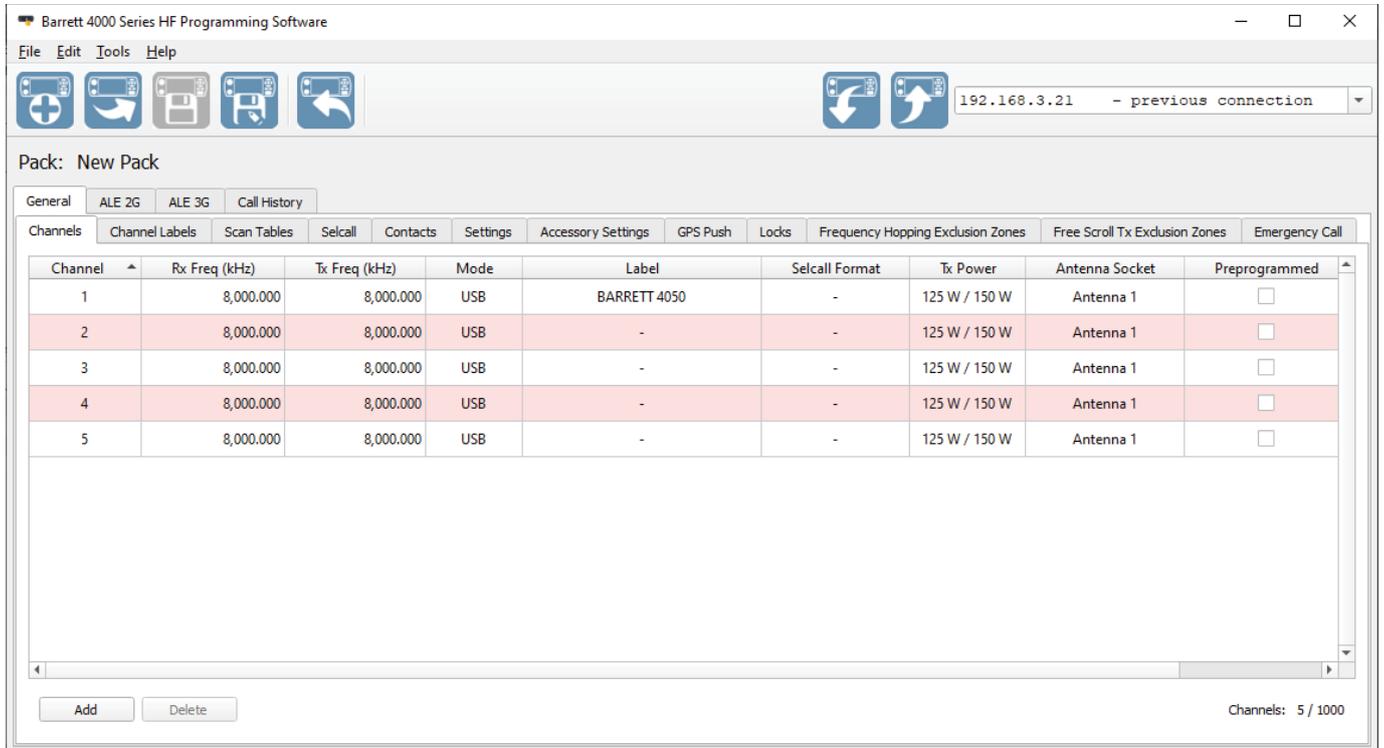
Tap "Import Configuration".

Select the required file to import. Confirm. Type the password if one was set up when initially retrieving the pack.

The import process will then begin automatically, showing a progress bar. A prompt may appear asking for confirmation in case the system topology has changed. The configured pack topology may differ from the current topology e.g. a second head has been installed but not enabled in the pack (see Accessory Settings [page 27](#)). Select "Proceed". Remove the USB storage device when prompted.

Channels

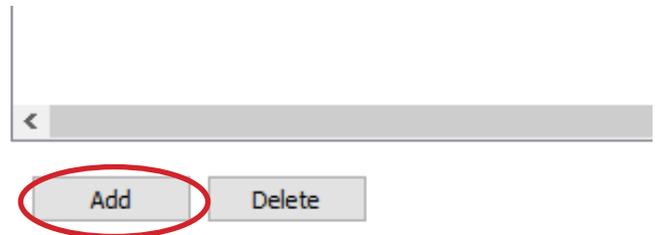
This tab allows the user to add and configure channel settings for a pack.



Adding a Channel

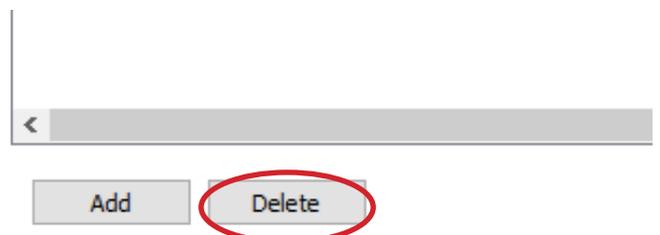
New channels are added by adding rows to the table. These new channels are automatically assigned the next consecutive number.

To add a channel, click  from the bottom left corner of the programming window.



Deleting a Channel

To delete a channel, first select it, then click  from the bottom left hand corner of the programming window.



Editing a Channel

Double click a field to edit it.

The following fields can be edited:

Channel Number

This is the number displayed on the transceiver screen.

Rx Frequency

This is the frequency a channel will receive transmissions on. It must be a figure between 250.000 and 30,000.000 kHz. The default Rx Frequency is 8,000.000 kHz.

Tx Frequency

This is the frequency the channel will transmit on. It is usually programmed to be the same as the Rx Frequency but it must be a figure between 1,600.000 and 30,000.000 kHz and . Programming this figure as 0.0 will disable the transmit function creating a channel that is receive only. The default frequency is 8,000.000 kHz.

Mode

4000 series transceivers support multiple modulation modes for channel frequencies. From the drop down menu, select one of the following:

USB - Upper Side Band

LSB - Lower Side Band

CF - Custom Filter

CW - Continuous Wave - used for Morse code

AM - Amplitude Modulation

Label

Channel Labels are used to label a channel e.g. to designate it as part of a group. The drop down menu will change dynamically depending on the labels programmed under the Channel Labels tab. For more information, see [page 14](#).

Selcall Format

This sets the selcall format for the channel. This menu is dynamic and will be changed depending on the selcall networks set for the pack (see Selcall [page 16](#)). From the drop down menu, select one of the following:

-(none) - Selcall is disabled

INT - International - the International Selcall standard

CCIR - Consultative Committee on International Radio Selcall standard

OEM - Original Equipment Manufacturer Selcall standard

RFDS - Royal Flying Doctor Service format (Australia use only)

NW1...NW5 - networks configured under the Selcall tab.

Tx Power

The transmit power of the transceiver associated with the channel.

10W - used to conserve battery power and in situations of short range transmissions

30W - for use with radios in manpack configuration

125/150W - default power setting

Antenna Socket

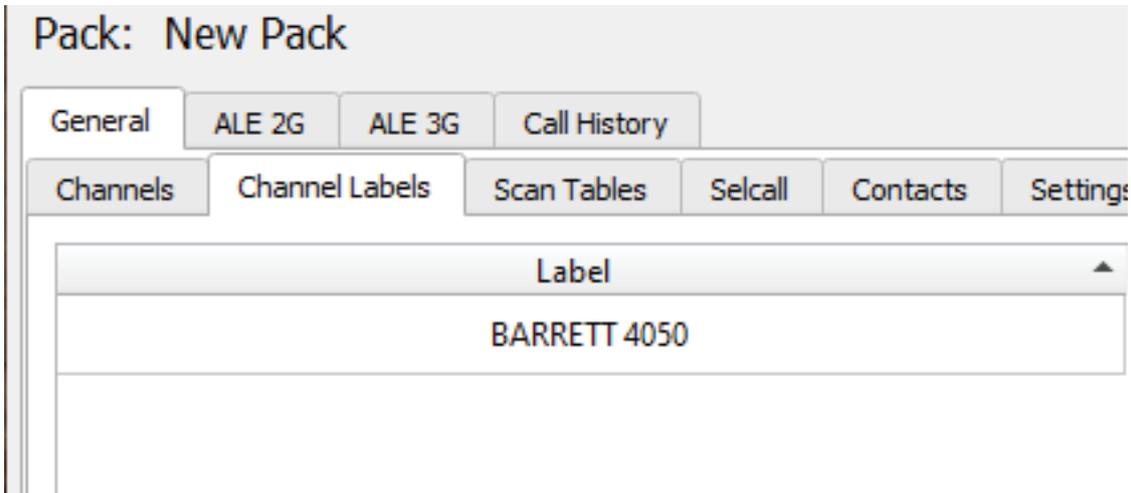
Unless a transceiver is connected to a Barrett Breakout Box (BoB) (P/N BCA40050), only one antenna can be connected per transceiver, hence only Antenna 1 need be selected from the drop down menu. If a BoB is connected, use this menu to allocate a specific frequency to a specific antenna (Antenna 1 or Antenna 2).

Preprogrammed

This checkbox makes a channel read-only once the pack has been imported into a transceiver. The channel cannot be altered or deleted from the display panel if this box has been selected.

Channel Labels

Channel labels are used to name a channel and remind a user what a channel is used for e.g. Barrett Base Station. These are not transmitted at any point.

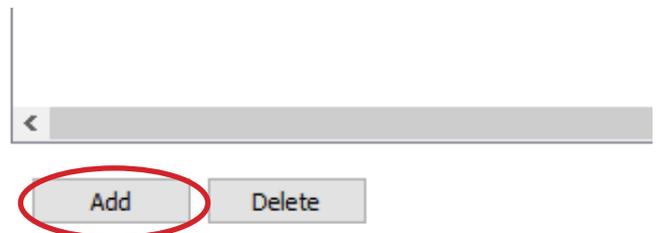


Add Channel Labels

New channel labels are added by adding rows to the table. These new labels are automatically assigned the next consecutive number and the text LABEL, as shown above.

To add a channel, click from the bottom left corner of the programming window. Labels are limited to 40 characters.

Labels are applied to a channel via the Channels tab of the programming software. See [page 11](#) for more information.

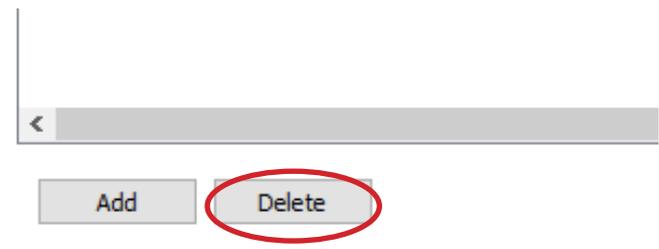


Edit a Channel Label

Double clicking on a label allows the pre-set text to be over written.

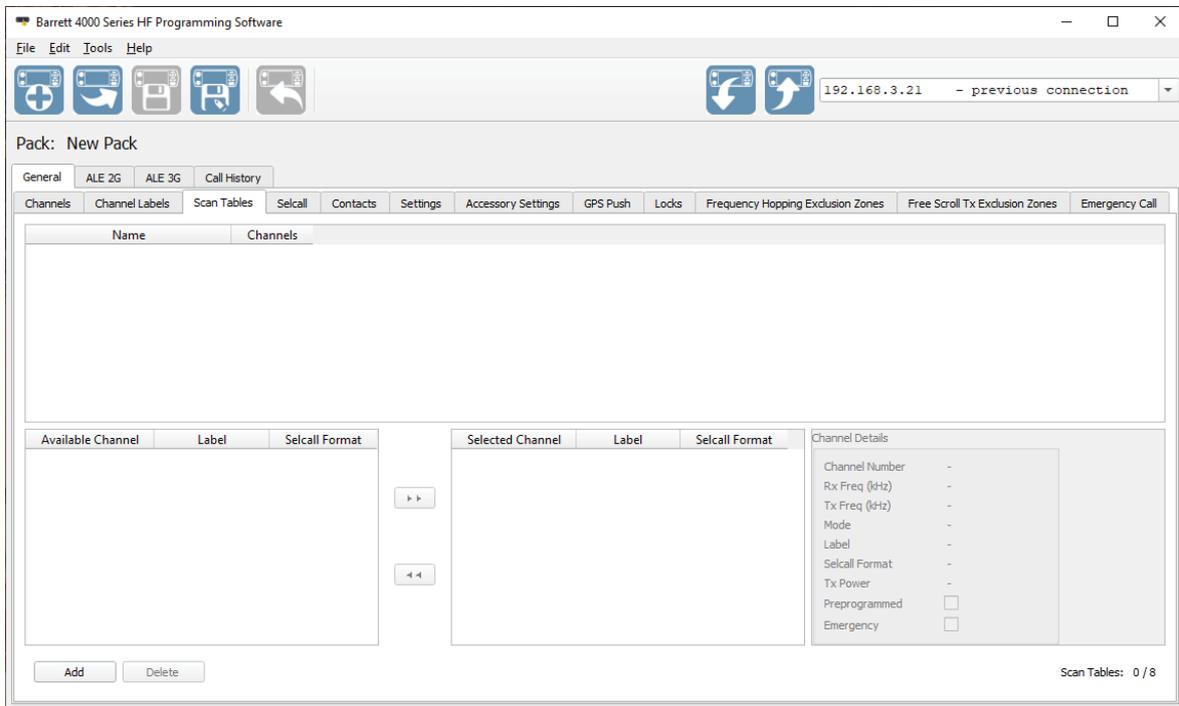
Deleting a Label

To delete a channel, first select it, then click from the bottom left hand corner of the programming window.



Scan Tables

Scan tables are used for non-ALE setups and should not be confused with preset maps, used with ALE 2G, and pool entries, used with ALE 3G. The Scanning feature of the transceiver allows it to monitor several channels for incoming calls. These channels are organised in a scan table. The scan table is a set of channels that the transceiver will rotate through.



Add a Scan Table

New scan tables are added by adding rows to the top table.

To add a scan table, click  from below the scan table list.

Adding Channels to the Scan Table

The list of channels already in a scan table will appear in the bottom right list. Channels that are not in the scan table are displayed in the bottom left list.

To add channels into a scan table, select them from the Available Channels list. Select and click  to add them to the table. The channel will then move to the right hand Scan Channels list. Select an channel from the Scan Channels list and click  to remove a channel from the scan table.

Configuring a Scan Table

Name

Names are used to name a scan table and remind a user what a channel is used for eg. Barrett Stations. These are not transmitted at any point.

Double-click on a name to over-write the preset text.

Channels

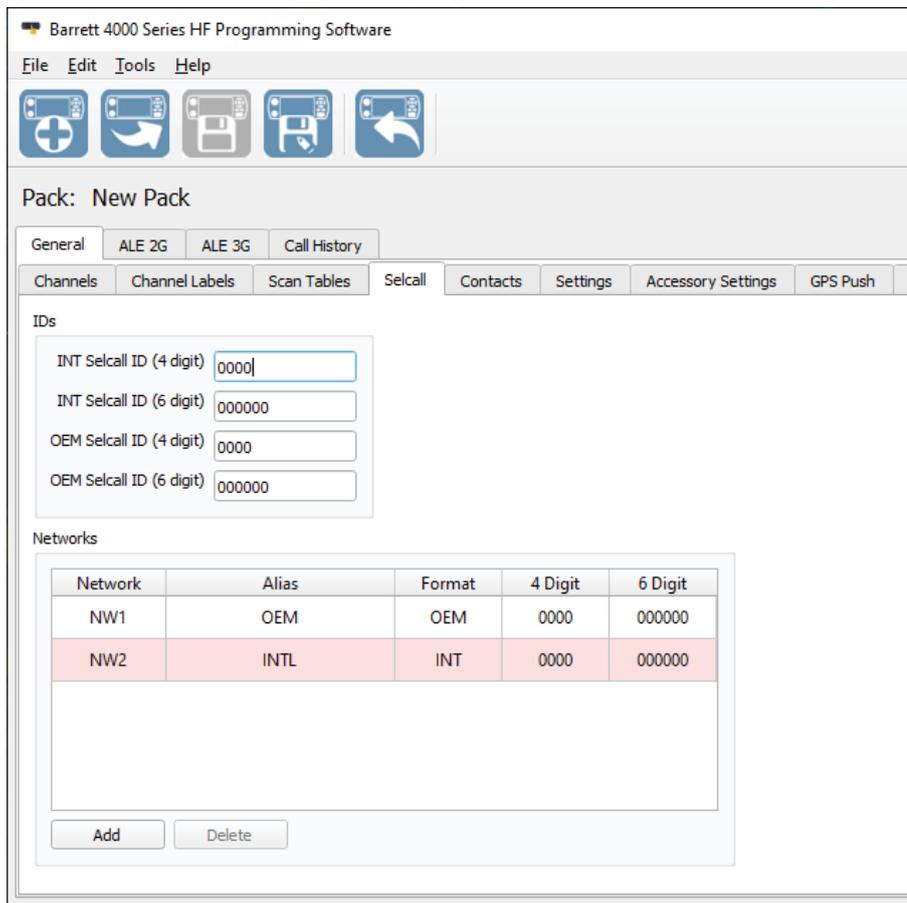
Channels in this context refers to the number of channels set to this scan table. In the screen displayed on the previous page, there is only 1 channel set to the scan table.

Deleting a Scan Table

To delete a scan table, first select it, then click  from the below the scan tables list.

Selcall

Selcall IDs are an integral part of Selcall communications and need to be set up before Selcall operation can begin. These are either provided by a network or generated by a system administrator. This section also covers Selcall Networks which function as a list of the transceiver's 4 and 6 digit IDs on various HF networks.



Entering a Selcall ID

The transceiver can have up to 4 default Selcall IDs: Two in INT format (a 4-digit and a 6-digit ID) and two in OEM format (a 4-digit and a 6-digit ID). **It is important to note that no Selcall ID can end in a 0 (zero) as this will interfere with the transceiver's collective calling capabilities.**

A Selcall ID may be allocated by a specific network or chosen by a network administrator. No two transceivers in the same network can have the same Selcall ID but a single transceiver can have up to five Selcall IDs allocated to it for use on various networks. These are stored as Selcall Networks.

Selcall Networks

As a transceiver can be part of multiple networks, it can have multiple Selcall IDs assigned to it. These may not be the same across all networks and, for this eventuality, the Selcall IDs of up to 5 networks can be stored on the transceiver.

Alias

Network aliases are used to name a network and remind a user what the Selcall IDs are used for eg. Barrett Stations. These names are not transmitted at any point.

To change a network name, double-click on a name to overwrite the preset text.

Format

Format refers to the type of Selcall format the network uses, whether INT, CCIR, OEM or RFDS.

Double-click on the format to display the drop-down menu. Select one of the above format types.

4 Digit

This refers to the four-digit Selcall ID for a particular network.

6 Digit

This refers to the six-digit Selcall ID for a particular network.

Deleting a Selcall Network

To delete a Selcall Network, first select it, then click  to delete it from the list.

Contacts

Contacts are a list of stations and their corresponding Selcall IDs, ALE 2G and 3G addresses, Telcall number and email addresses for easy calling. These can also be programmed through the transceiver's front panel display.

General									
Channels									
Channel Labels									
Scan Tables									
Selcall									
Contacts									
Settings									
Accessory Settings									
GPS Push									
Locks									
Frequency Hopping Exclusion Zones									
Favourite	First Name	Surname	ID Type	ID	ALE 2G Alias	ALE 3G Alias	Telcall Number	Email Address	
<input type="checkbox"/>	New0	Contact	None						
<input type="checkbox"/>	New1	Contact	None						

Adding a New Contact

To add a contact, click  from the bottom left corner of the programming window.

Editing a Contact

To edit a new or existing contact, double-click in a parameter field and enter the appropriate information.

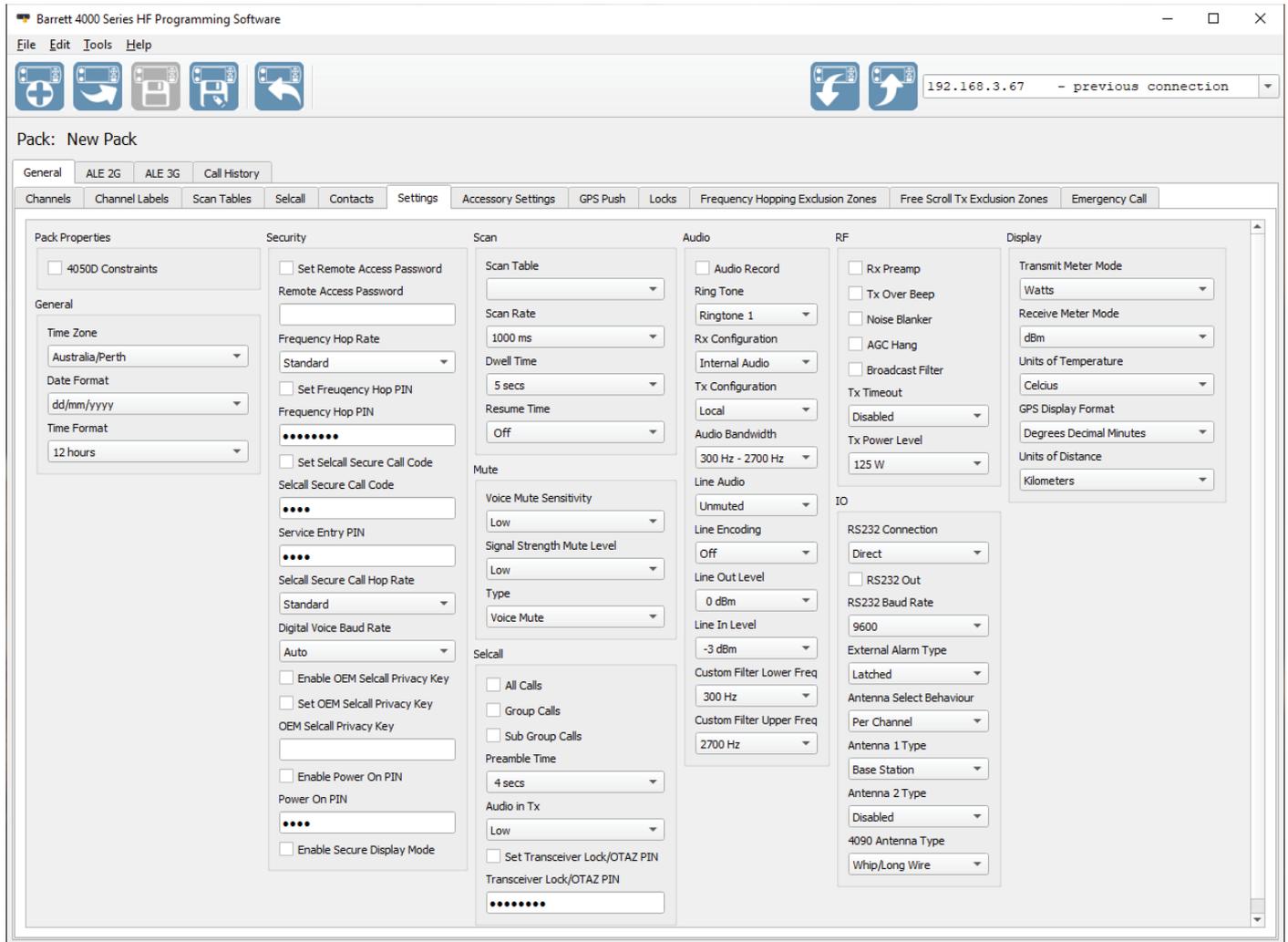
Please note that all fields need not be completed for the contact to be considered valid.

Field	Explanation
Favourite check-box	Checking this box, will present the given address in the favourites section of the transceiver's contact list, in addition to the full contacts list.
First Name	The given name of the contact, whether a person or station name.
Surname	The family name of a given contact
ID Type	Choose the type of Selcall ID for input, whether None, 4-Digit, 6-Digit or ARINC
ID	The Selcall ID of the contact. This will match the ID type selected.
ALE2G Alias	The name assigned to this contact for use with ALE2G calls (see page 37)
ALE3G Alias	The name assigned to this contact for use with ALE3G calls (see page 44)
TelCall number	Used for making Telcalls
Email Address	The email address of the contact

Deleting a Contact

To delete a contact, first select it, then click  to delete it from the list.

Settings



These settings can be configured to suit operator or network requirements. A brief description of each is provided below.

Pack Properties

4050D Constraints

This enforces a set of constraints upon the packs creation. It disables ALE 3G, limits the number of channels that can be programmed to 200, the contact list to 300 and the power output to 125W.

General

Time Zone

Select the time zone for the transceiver. This is used to assist with internal clock settings.

Date Format

This sets the format that the date will appear on the home screen. It can be set to one of the following five settings:

dd/mm/yyyy

mm/dd/yyyy

dd-mm-yyyy

yyyy/mm/dd

yy/mm/dd

Time Format

This selects the format that the time of day will be displayed on the transceiver home screen. The formats available are 12 hour and 24 hour.

Security

Set Remote Access Password

The Remote Access Password can be required when accessing a transceiver remotely by Remote Control App, Programming Software or Networked RS232. Selecting this check box allows the Remote Access Password to be imported into the transceiver with the pack. De-selecting this box means that the Remote Access Password will not be imported to the transceiver.

Remote Access Password

The Remote Access Password can be up to 20 characters long. To clear the password, remove all characters from the Remote Access Password field and ensure that the Set Remote Access Password checkbox is selected.

Frequency Hop Rate

Frequency Hopping requires an export permit.

Frequency hopping can be used to limit performance degradation due to interference and to reduce the likelihood of interception. Frequency Hopping Spread Spectrum (FHSS) is a method of transmitting radio signals by rapidly switching a carrier among many frequency channels.

The Standard rate of channel hopping is 5 hops per second and High is 25 hops per second.

Set Frequency Hop PIN

Selecting this check box allows the Frequency Hop PIN to be imported into the transceiver with the pack. De-selecting this box means that the Frequency Hop PIN will not be imported to the transceiver.

Frequency Hop PIN

The frequency hopping pin must be the same in the transmitting and receiving transceivers for the transmission to be understood. This allows the transceivers to hop in sync.

Type up to eight digits to enter the frequency hopping key. This PIN is not retrievable for security reasons.

Set Selcall Secure Call Code

Selecting this check box allows the Selcall Secure Call Code to be imported into the transceiver with the pack. De-selecting this box means that the Selcall Secure Call Code will not be imported to the transceiver.

Selcall Secure Call Code

The Secure Call option provides the transceiver operator with a secure speech path using an in-band hopping technique. It differs from military frequency hopping systems as it is narrow band confined to the assigned channel bandwidth of 3KHz. Secure Call is simple to use requiring each radio to be setup with the same four digit "Selcall Secure Call Code".

Enter four digits to encrypt calls. This PIN is not retrievable for security reasons.

Note: The 4 digit secure call code must be the same for both transmitting and receiving stations.

Service Entry PIN

Enter four digits to set the service entry PIN. Entering the PIN in the transceiver menu (Settings < Security) will unlock every menu in the transceiver. This can be locked for operators under the Locks tab (see [page 32](#)). PIN 0000 disables the service entry PIN feature.

Selcall Secure Call Hop Rate

Selcall Secure Call Hop Rate refers to the rate of Hopping whilst the transceiver is in secure mode, providing an additional level of encryption using the Selcall Secure Call Code. See Frequency Hop Rate and Selcall Secure call Code.

Digital Voice Baud Rate

Configures the baud rate for digital voice transmission only - the transceiver will always adjust the receiving baud rate. The default setting is "Auto" which will start at the lowest baud rate (600bits/sec for AES256 or 700bits/sec for DES56) and work itself up to the maximum of 2400bits/sec during the conversation with another radio station. Fixed baud rates are 600, 700, 1200 or 2400bits/sec.

Enable OEM Selcall Privacy Key

Select this checkbox to set the default setting for the OEM Privacy Key as On. This can be switched to Off from the transceiver display via Settings<Security.

Set OEM Selcall Privacy Key

Selecting this checkbox allows the OEM Selcall Privacy Key (see below) to be imported into the radio with the pack. De-selecting this box means that the OEM Selcall Privacy Key will not be imported to the radio.

OEM Selcall Privacy Key

A privacy key (max. 8 alphanumeric characters), when enabled, encrypts 4 digit/6digit OEM Pagecalls, OEM GPS Calls and OEM Status Calls . The same OEM Privacy Key must be entered at the receiving radio in order to decrypt the data. This PIN is not retrievable for security reasons.

Enable Power On PIN

Enabling the Power On PIN ensures that the transceiver the pack is imported to will require a PIN to be entered upon start up.

Power On PIN

A Power On PIN is a unique 4 digit code that, if enabled, will be prompted upon the start-up of the transceiver. The Pin is set in this field.

Enable Secure Display Mode

Enables Secure Display mode. This mode hides the channel frequency and label, limits the actions of an operator so that they cannot add channels or edit channel frequencies or labels and disables Free Scroll Rx/Tx and pack exportation. This will also disable the serial commands to show the channel frequencies.

To temporarily (until next reboot) disable the secure display mode, enter the configured service entry PIN.

Scan

Scan Table

This menu will reflect the scan tables entered under the Scan Tables tab. The default scan table for the pack can be selected from the drop-down menu.

Scan Rate

The rate at which the channels are cycled though in the scan table in milliseconds. Changing the scan rate can be useful in situations where scan tables have a large number of channels (decreasing the time spent on each channel) or those where listening to voice on each channel is important (increasing the time spent on each channel). However, any channel in the table programmed as a Selcall channel, will automatically spend 500ms per channel, despite the Scan rate setting.

Dwell Time

Select the length of time the transceiver dwells (waits) on a channel after scan has been stopped by signal strength level (if signal strength level mute is set) or voice activity (if audio mute is set).

Select between 1 and 10 seconds.

Resume Time

The period of time after which the transceiver will automatically resume scanning from the last operation eg. after a key press or PTT, is referred to as the Resume Time. This is measured in minutes.

Mute

Voice Mute Sensitivity

Voice Mute Sensitivity refers to the “hardness” of the voice mute and its sensitivity to voice activity on a channel.

Signal Strength Mute Level

Signal Strength Level refers to the level at which the mute (squellch) opens. When set to low, the mute will open on a relatively low level of received signal. For high, the mute will open for a relatively high level of received signal.

Type

Selecting the mute type for the pack, whether Voice Mute, SSL Mute, Call Mute, sets the defaultmute type for the transceiver upon start-up. This can be manually changed from the transceiver display via Settings<Mute or long press on the Mute button.

Selcall

All Calls, Group Calls, Sub Group Calls

Collective calls comprise of all-calls, group calls and sub-group calls which involve calling a number of Selcall IDs simultaneously. This is not an individual button in the Selcall menu as a transceiver can group call as a number of call types. See the Barrett 4050 HF SDR Transceiver manual (P/N BCM40500) for more information on these call types.

Preamble Time

Selcall preamble consists of a sequence of alternating bits (i.e. 0101010....), and can range anywhere from 1 second to 10 seconds. The preamble has two purposes:

1. Tells the receiving radio to stop scanning. It is recommended that the length of preamble is at least half of the number of channels being scanned. (i.e. If 6 channels are being scanned then the Selcall preamble length should be set to a minimum of 3 seconds)
2. Allows the selcall decoder in the transceiver to achieve bit synchronisation thus allowing the Selcall data to be decoded.

Audio in Tx

Sets the master audio settings for transmissions. Select High, Low or Off.

Set Transceiver Lock/OTAZ PIN

Selecting this checkbox allows the Lock PIN (see below) to be imported into the radio with the pack. De-selecting this box means that the Transceiver Lock PIN will not be imported to the radio.

Transceiver Lock/OTAZ PIN

A Transceiver Lock PIN is a PIN that allows a transceiver to lock a remote transceiver via selcall. This Transceiver Lock PIN is the locking PIN for the local transceiver. A remote transceiver would need to transmit this code in order to remotely lock the transceiver. This is an 8 digit PIN with "00000000" disabling the function. See the Barrett 4050 HF SDR Transceiver manual (P/N BCM40500) for more information.

Audio

Audio Record

This option is used to monitor conversations. It utilises the line audio (the auxiliary socket's 600ohm balanced audio) to listen to the received and transmitted audio.

Ring Tone

Choosing from one of the seven available ringtones sets the tone of the transceiver alarm. This can also be changed via the transceiver display via Settings<Audio.

Rx Configuration

This option sets whether the transceiver receives audio via the antenna or from the auxiliary socket's 600 ohm balanced audio port (the Line).

Selecting "Internal" ensures the transceiver receives audio through the antenna.

For "External", the transceiver receives through the Line. This can be used in many situations e.g. for a remote receiver in split site operations and audio is received from the remote site.

Tx Configuration

This option sets whether the transceiver transmits to the antenna or down the line.

When set as "local" the transceiver transmits through the antenna.

When set as "remote", the transmit audio is sent through the auxiliary socket's 600 ohm balanced audio port.

Audio Bandwidth

This section allows the audio bandwidth to be tailored to an operator's requirements.

Select either:

300 Hz - 2700 Hz: used for reduced bandwidth voice operation

300 Hz - 3000 Hz: standard voice and data operation

300 Hz - 3200 Hz: custom filter 1

300 Hz - 3400 Hz: custom filter 2

Line Audio

This option sets the muting condition of the 600 ohm balanced audio line output on the rear auxiliary connector.

The line output can be set to Unmuted or Follows Mute. When set to Follows Mute, the line output is muted in the same manner as the speaker output and follows the mute condition currently in use. The line output is usually set to Unmuted when using data modems. Follows Mute should be selected when the transceiver is being used with 2062 crossgate.

Line Encoding

If enabled line audio will be encoded with the installed OEM scrambler the same way as control head audio (microphone/speaker).

Line Out Level

This setting adjusts the output level of the auxiliary 600 ohm balanced audio output port. Changing the Line levels may be required when connecting to equipment with specific audio level requirements.

Line In Level

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

Custom Filter Lower Freq

Modem waveforms occupy a much larger bandwidth than voice communications which allows them to optimise signal integrity. Adjusting the CF lower and upper frequencies allows the transmission range to be much larger. This can only be used when operating in CF mode.

Custom Filter Upper Freq

See above.

RF

Rx Preamp

The pre-amplifier provides an additional receiver gain of 9 dB. Generally, the RF pre-amplifier is switched off when an automatic mobile antenna is in use as most of these have a built-in RF pre-amplifier.

Tx Over Beep

When this option is selected, the transceiver transmits a short tone after the PTT button is released. The tone provides an audible indication to the operator at the remote station that the local station has stopped transmitting.

Noise Blanker

The noise blanker is useful to reduce repetitive vehicle related electrical interference eg. noise from a windscreen wiper motor.

Note: The noise blanker will not be effective in situations where for example, external power line noise is blanketing the receiver.

AGC Hang

Automatic Gain Control (AGC) Hang delays the AGC system's gain response after a signal level decreases to zero. This prevents receiver background noise from being amplified for the hang period.

Broadcast Filter

With the Broadcast Filter enabled, strong broadcast signals below 1.6 MHz will be filtered out.

Tx Timeout

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

Set the maximum transmit time to either one, two, or three minutes. Alternatively, this transmit timeout can be disabled.

Tx Power Level

This section sets the global RF power output for all channels in the transceiver.

Select either: 10 W, 30 W, 125 W, or 150 W.

I/O

RS232 Connection

This selects whether the RS232 connection is made via a direct connection through the auxiliary port or via network (TCP/IP - TCP port 58001).

RS232 Out

This setting enables or disables RS-232 Selcall information output from the transceiver via the 25 pin auxiliary connector.

Select Enabled or Disabled.

Note: This command does not allow RS-232 control of the transceiver as enabled when the RS-232 option is fitted. It is used to control the output of Selcall information used by some external programs such as vehicle tracking.

RS232 Baud Rate

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

The higher the baud rate, the faster data is sent / received. However, 9600 should be selected for compatible devices.

Select either: 9600 or 115200.

External Alarm Type

This sets the action of the external alarm output when a Selcall is received by the transceiver. It can be set to either a pulse output (for use with a horn) where the output is activated 15 seconds on, 15 seconds off; or a constant output (for use with

a rotating beacon). Both are reset by pressing  on the control head display or the PTT button.

Select either: Latched or Pulsed.

Antenna Select Behaviour

This master setting can override the pre-programmed channel antenna selection. Select:

Per Channel (default): Antenna selection operates as per channel programming.

Antenna 1: All channels, regardless of programming, will transmit using Antenna 1.

Antenna 2: All channels, regardless of programming, will transmit via Antenna 2.

Antenna Type 1

This menu sets the antenna type or linear amplifier used with the transceiver. This can be changed from the transceiver display. Changing the antenna selected changes the transceiver behaviour when transmitting to correctly tune according to the frequency and antenna selected. Incorrect antenna choice can lead to damage to the tuner.

Select an antenna type from the following:

Antenna Type	Select when...
Base Station	Base station antennas such as the Barrett 912 series are used. No tuning signals are emitted on channel change. This selection should also be used when operating with a Barrett 914 broadband tapped whip.
910 Tuner	Using a Barrett 910 automatic tuning mobile antenna
911 Tuner	Using a Barrett 911 automatic tuner
2019 Tuner	Using a Barrett 2019 automatic tuning mobile HF antenna
2018 Loop Antenna	Using the 2018 Mobile magnetic loop HF antenna
4075 Linear Amplifier	Using the transceiver with a Barrett 4075 series linear amplifier.
4075 Linear with ATU	Using the transceiver with a Barrett 4075 series linear amplifier with ATU.
4011 Tuner	Using a Barrett 4011 automatic tuner

Antenna Type	Select when...
4017 Tuner	Using a Barrett 4017 automatic tuner
OEM Tuner 1	Using a non-Barrett tuner. Please contact Barrett Communications for more information.
OEM Preselector	Using a non-Barrett preselector
OEM Tuner 2	Using a non-Barrett Tuner. Please contact Barrett Communications for more information.

Antenna Type 2

Antenna 2 is only available if the transceiver is connected to a Barrett Break-out-Box (BoB). Note that the 4075 Linear Amplifier and 4075 Linear with ATU options are unavailable for Antenna Type 2. See Antenna Type 1 (above) for more information.

Select an antenna type from the following:

Antenna Type	Select when...
Base Station	Base station antennas such as the Barrett 912 series are used. No tuning signals are emitted on channel change. This selection should also be used when operating with a Barrett 914 manual tapped whip.
910 Tuner	Using a Barrett 910 automatic tuning mobile antenna
911 Tuner	Using a Barrett 911 automatic tuner
2019 Tuner	Using a Barrett 2019 automatic tuning mobile HF antenna
2018 Loop Antenna	Using the 2018 Mobile magnetic loop HF antenna
4011 Tuner	Using a Barrett 4011 automatic tuner
4017 Tuner	Using a Barrett 4017 automatic tuner
OEM Tuner	Using a non-Barrett tuner
Disabled	Default. Not using a tuner

4090 Antenna Type

Used exclusively with the Barrett 4090 and PRC-4090 transceivers, this selects between Whip/Long Wire or 50 Ohm.

Display

Transmit Meter Mode

This modifies the display mode of the transmit signal on the transceiver display. Transmit strength can be displayed as either Chevrons or Watts.

Receive Meter Mode

This modifies the display mode of the receive signal on the transceiver display. Receive strength can be displayed as dBm, uV or S Meter.

Units of Temperature

This modifies the display mode of the temperature on the transceiver swipe menu display. Temperature can be displayed in Fahrenheit or Celsius.

GPS Display Format

This modifies the display mode of the GPS coordinates on the swipe menu display. GPS position can be displayed in fractions of a minute or fractions of a second.

Units of Distance

These units correspond to those displayed when a GPS Pos or GPS Req call are received. The distance between the local and remote positions can be displayed in kilometres, miles or nautical miles.

Accessory Settings

The 4000 series transceivers can support two control heads. The Primary control head in this menu refers to the control head attached to the front of the 4050 transceiver and the control Handset .

The secondary control head can be connected simultaneously to the 4050 transceiver via the AUX Control Head/BoB connector on the rear of the transceiver. An additional control head can be purchased from Barrett Communications (P/N BCS40005). For more information, see the Barrett 4050 HF SDR Transceiver manual (P/N BCM40500).

Both the Primary and Secondary Control head settings are the same. As such, they will only be mentioned together.

Primary/Secondary Control Head

Head Installed

Checking this box, indicates that a primary/secondary control head has been installed.

Set Control Head Name

Selecting this checkbox allows the control head name (see below) to be imported into the radio with the pack. De-selecting this box means that the control head name will not be imported to the radio and the default name will be "Barrett SDR 4050" and the serial number of the transceiver. The tick box is automatically deselected after exporting from a SDR to prevent accidentally overwriting the name when importing into another SDR.

Name

This name is used to refer to the control head and this will be used to identify the transceiver on external networks such as the Barrett SDR Control Head Application. To set the name, tick the 'Set Control Head Name' check box.

General: Language

Selects the language the control head defaults to upon start up. This can be modified from the control head display.

General: Mic Up/Down Keys

Sets the default function of the up and down arrow keys on the hand held microphone. Can control, channels, volume or can be disabled. This can be modified from the control head display.

Audio: Beep Level

This sets the default volume level for the key tones throughout the transceiver. It can be set to High, Low or off. This can be modified from the control head display.

Audio: Alarm Level

Volume control for the incoming Audio Alarm. Can be set to Low, Medium, High or Mute. This setting can be adjusted from the control head display.

Display: Backlight Level

Sets the default backlight level of the LCD display. Can be set to Low, Medium, High or Very High. This setting can be adjusted manually through the control head display.

Display: Backlight Timeout

Length of time before the Display Timeout Behaviour activates. Can be configured as Short (1min), Long (3min) or Always On. These settings can also be modified from the control head display.

Display: Timeout Mode

This refers to the Display Timeout Behaviour described above. The display will either Dim, Switch Off or activate the screen-saver after the Backlight Timeout time has elapsed.

Audio: Speaker Volume (%)

This sets the default speaker volume (as a percentage of total volume) for the transceiver control head upon start up. This can be adjusted from the control head display.

Network Encryption

Encrypts data transfers over IP/TCP connections.

RS232 Network Encryption

Encrypts data transfers over a network that are intended for the RS232 port. Transceiver RS232 Connection must be set to 'Network' rather than 'Direct'.

ED137

Enable interoperability standards for VoIP ATM Radio Components (ED137/1C)

4050 BoB Discovery

This box must be checked if using the legacy product Barrett Break-out-Box (P/N BCA40050) (discontinued 2019). If a BoB is not connected, this box should remain unchecked.

Break Out Box

Break Out Box Installed

Checking this box indicates that a BoB is connected to the transceiver rather than a secondary control head as they share a connector.

Set BoB Name

This indicates the name of the BoB for identification on external networks.

Network Encryption

Encrypts data transfers over IP/TCP connections.

RS232 Network Encryption

Encrypts data transfers over a network that are intended for the RS232 port. Transceiver RS232 Connection must be set to 'Network' rather than 'Direct'.

GPS Push

GPS Push is an additional option used in conjunction with the Barrett 4077 HF Map & Track Software and provides automated transmission of GPS location at set intervals. For further information, please refer to the Barrett 4077 HF Map & Track User Guide.

Setting channels for GPS push capabilities operates in the same way as setting channels for a scan table. Available channels will be presented in the lower left list. Selecting one or more of these and clicking , adds the selection to the right hand list, granting GPS push capabilities to the channels. Selecting a channel from the right hand list and clicking  will return the channel selected to the left hand list, removing its GPS Push capabilities.

The channels in the right hand list become the channels that the GPS signal will be broadcast over.

The following fields can be modified in this tab:

GPS Push

Enabling or Disabling this feature sets the state of GPS Push upon start up of the transceiver. This can be modified from the transceiver front panel via Settings < GPS Push, or from the swipe menu.

Selcall Format

This sets the format of the GPS broadcasts, whether 4 digit or 6 digit.

Preamble Time

Same as Selcall Preamble. See [page 22](#).

Interval Time

This is the interval between broadcasts. For instance, if the interval is set 30 minutes, every 30 minutes a GPS position will be broadcast after the UTC Offset Time.

UTC Offset Time

This delays the first sounding from midnight UTC and the first GPS broadcast will be made at this time. If there is no UTC Offset Time the first GPS broadcast will occur at 00:00 UTC.

Set Privacy Key

Selecting this checkbox allows the Privacy Key (see below) to be imported into the radio with the pack. De-selecting this box means that the Privacy Key will not be imported to the transceiver.

Privacy Key

Enter a privacy key (8 alphanumeric characters). When enabled, the Privacy Key encrypts 4 digit/6digit GPS Calls. The same OEM Privacy Key must be entered at the receiving radio.

Locks

Checking any of the boxes in this tab will lock/hide the corresponding menu or item in the 4000 series HF transceiver. This will prevent an operator from altering settings from the transceiver display.

Pack: New Pack

General | ALE 2G | ALE 3G | Call History

Channels | Channel Labels | Scan Tables | Selcall | Contacts | Settings | Accessory Settings | GPS Push | Locks | Frequency Hopping Exclusion Zones | Free Scroll Tx Exclusion Zones

192.168.3.21 - previous conn

Features

- GPS Information
- USB Mode
- LSB Mode
- CF Mode
- CW Mode
- AM Mode
- Network Encryption

Security Settings

- Frequency Hop PIN
- Frequency Hop Rate
- OEM Secure Type
- OEM Secure Key
- Secure Digital Voice/Data Key
- Selcall Secure Call Hop Rate
- Selcall Secure Call Code
- Remote Access Password
- Secure Display Mode

Scan Settings

- Scan Rate
- Dwell Time
- Resume Time
- Scan Table Selection
- Scan Table 1
- Scan Table 2
- Scan Table 3
- Scan Table 4
- Scan Table 5
- Scan Table 6
- Scan Table 7
- Scan Table 8
- Scan Table: Add Entry
- Scan Table: Change Label

Audio Settings

- Beep Level
- Alarm Level
- Ring Tone
- Rx Configuration
- Tx Configuration
- Audio Bandwidth
- Line Audio
- Line Encoding
- Line Out Level
- Line In Level
- Audio Record

ALE Settings

- ALE Settings
- ALE State
- Add ALE Address
- ALE Data Editing

Front Screen

- Mode Button
- Channel Button
- Noise Reduction Button
- Hopping Button
- Scan Button
- Mute Button
- RX Scroll Function

Labels Settings

- Labels Settings

Channels Settings

- Label
- Rx Frequency
- Tx Frequency
- Mode
- Tx Power
- Selcall Format
- Antenna Socket

Mute Settings

- Voice Mute Sensitivity
- Signal Strength Mute Level

Selcall Settings

- Audio in Tx
- Preamble Time
- Selcall ID
- Transceiver Lock

RF Settings

- Rx Preamp
- Tx Over Beep
- Tx Timeout
- Noise Blanker
- Tx Power Level
- AGC Hang
- Broadcast Filter

IO Settings

- RS232 Connection
- RS232 Out
- RS232 Baud Rate
- External Alarm Type
- Antenna 1/2 Type

System Info Settings

- Options Installation
- Options Display

Call History Settings

- Call History Settings
- Update Call History
- Show/Delete/Reset Call History

Export Settings

- Export Configuration

Network Settings

- Network Settings

BoB Settings

- BoB Settings

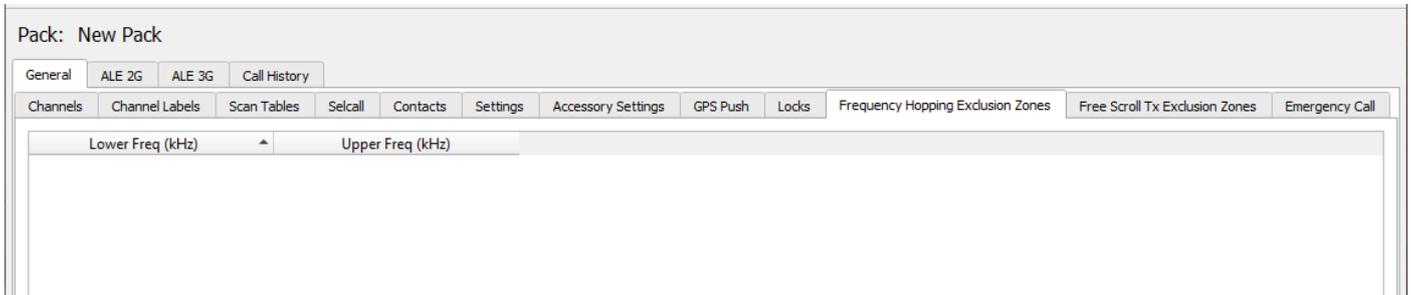
Import/Update Settings

- Import Configuration

Frequency Hopping Exclusion Zones

Frequency Hopping requires an Export Permit.

Frequency Hopping Exclusion zones are frequency ranges that are excluded when channel hopping. The system will not hop into any of the frequencies defined by any of the exclusion zone ranges. This is not reflected on the transceiver display.



Adding an Exclusion Zone

To add an exclusion zone, click  from the bottom left corner of the programming window.

Edit a Frequency Hopping Exclusion Zone

To edit a Frequency Hopping Exclusion Zone, select the zone and update the following fields:

Lower Frequency (kHz)

Enter a value for the frequency hopping exclusion zone's lower frequency (minimum 1,600 kHz)

Upper Frequency (kHz)

Enter a value for the frequency hopping exclusion zone's upper frequency (maximum 30,000 kHz)

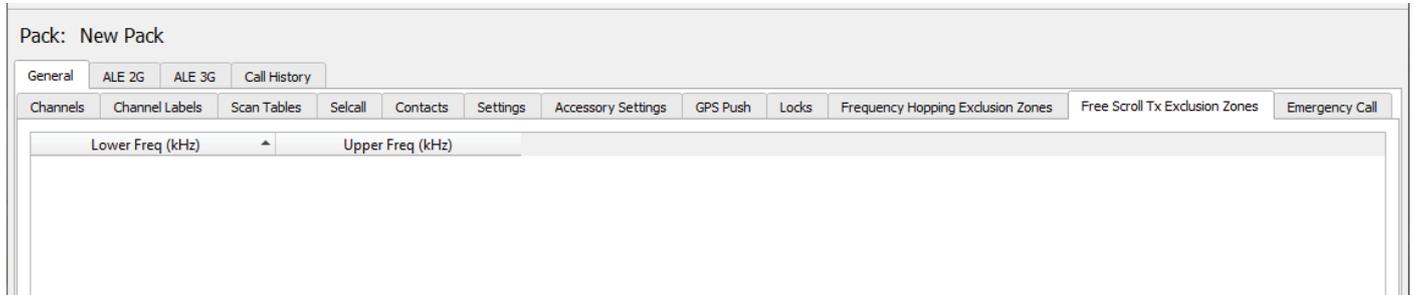
Deleting an Exclusion Zone

To delete a Frequency Hopping Exclusion Zone, first select it, then click  to delete it from the list.

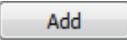
Free Scroll Tx Exclusion Zones

Free Scroll Tx Exclusion zones are frequency ranges that are excluded when in Free Scroll Tx mode. The system will not allow transmission in any of the frequencies defined by any of the exclusion zone ranges. This is not reflected on the transceiver display.

If a tuner is attached, the transceiver will re-tune on every PTT.



Adding an Exclusion Zone

To add an exclusion zone, click  from the bottom left corner of the programming window.

Edit a Free Scroll Tx Exclusion Zone

To edit a Free Scroll Exclusion Zone, select the zone and update the following fields:

Lower Frequency (kHz)

Enter a value for the frequency hopping exclusion zone's lower frequency (minimum 1,600 kHz)

Upper Frequency (kHz)

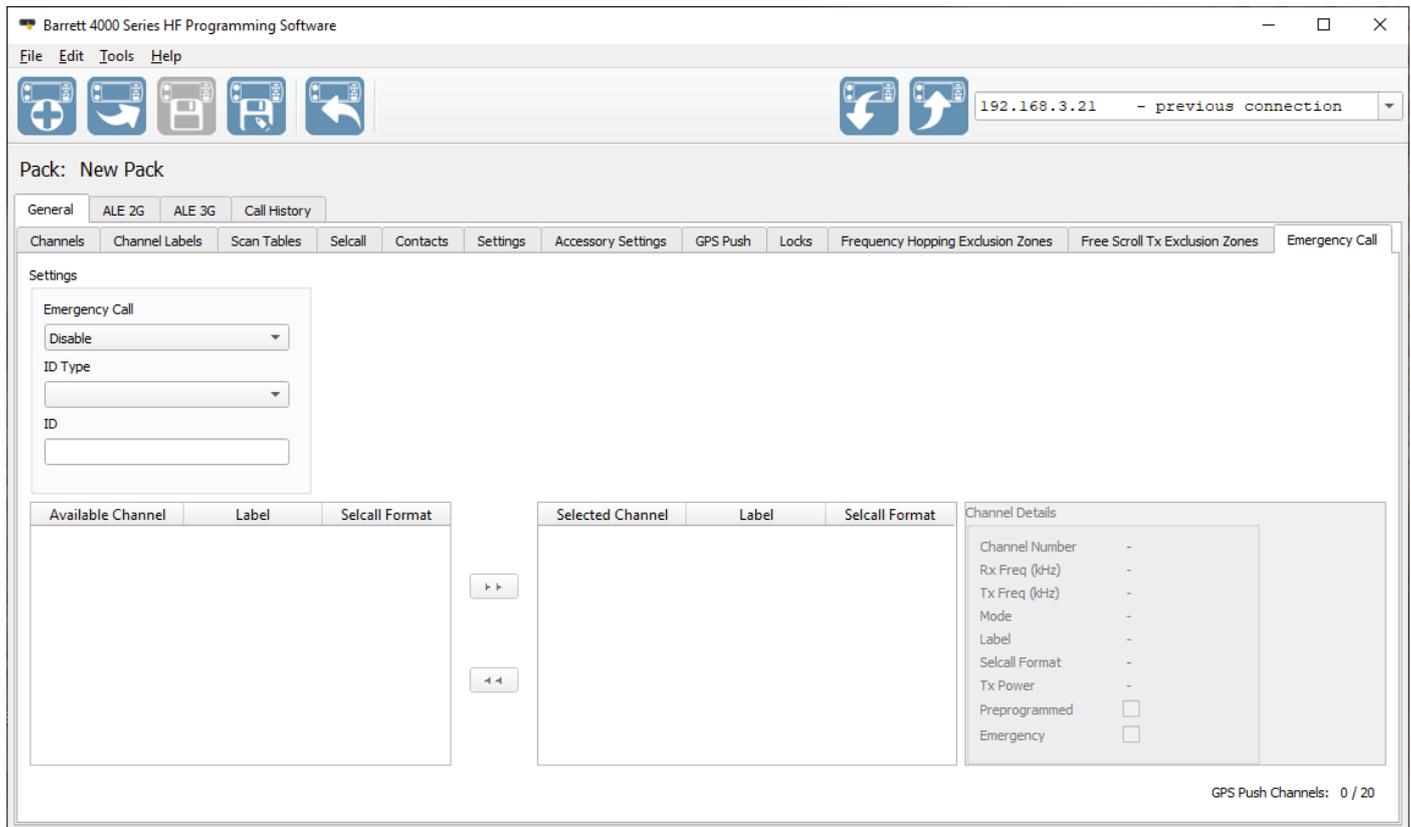
Enter a value for the frequency hopping exclusion zone's upper frequency (maximum 30,000 kHz)

Deleting an Exclusion Zone

To delete an Exclusion Zone, first select it, then click  to delete it from the list.

Emergency Call

Emergency calls are sent via Selcall on up to 20 selected Selcall enabled channels. The emergency will be sent via the per channel selectable Selcall type (INT, OEM, CCIR).



Settings

Emergency Call

Enable or disable the feature

ID Type

Select one of the following:

Broadcast

Entered ID has no effect, broadcast will always select Selcall address "0000"

Fixed

Entered ID will be used to call during an emergency.

User Selectable

Entered ID will be used as a default which can be adjusted before issuing an emergency call.

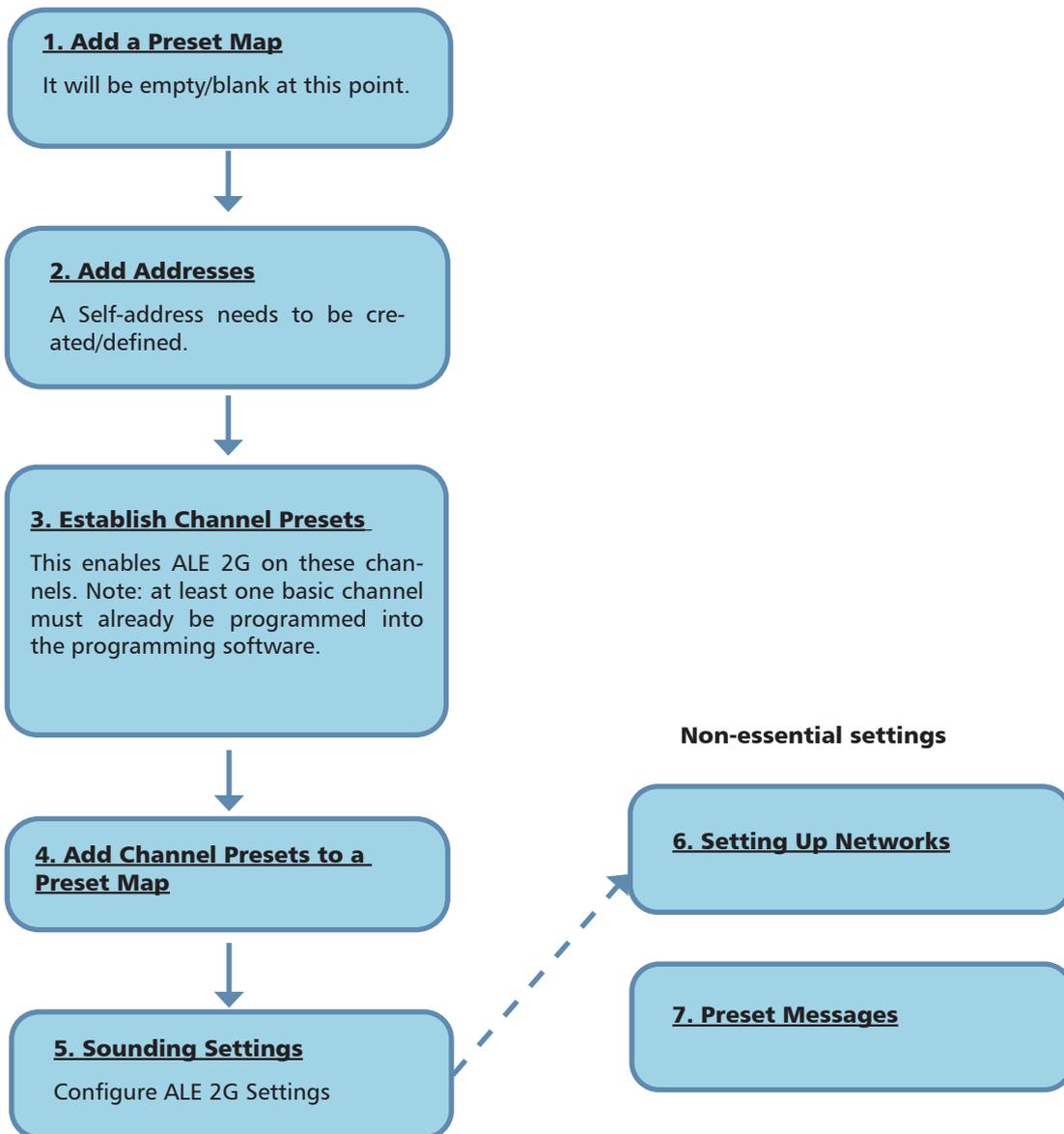
ID

Only effective for Fixed or User Selectable. Can be 4 or 6 digits long.

For more information concerning ALE 2G and ALE 3G, please consult the ALE 2G and ALE 3G User Guide (P/N BCM40524).

ALE 2G Set Up Procedure

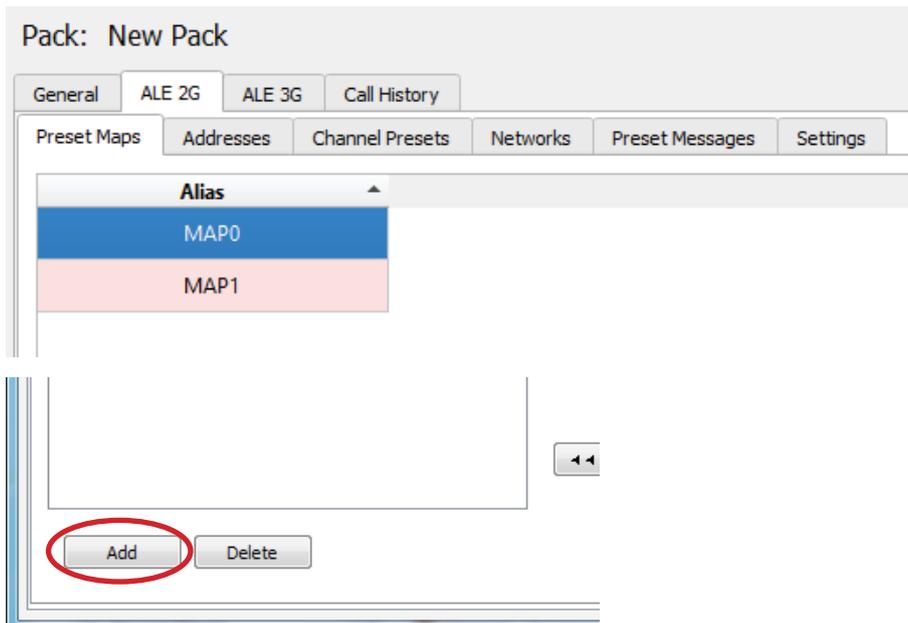
ALE channels are mapped to the standard channels that the transceiver has been configured with. This mapping is configured by accessing the Channel Presets tab. The following work flow is recommended for setting up ALE 2G in the Barrett 4000 Series HF SDR Programming Software:



Each of the above steps is described in more detail in the following pages.

1. Add a Preset Map

A preset map is a group of channels that the transceiver can cycle through. It is the 2G equivalent of scan tables (non-ALE setup) or pool entries (ALE 3G). To create a new preset map, click "add" in the bottom left-hand corner of the programming window.



2. Add Addresses

ALE addresses function as identification. Self Addresses are the identification of the users transceiver. Other, denotes all other transceivers in the network. Both Self and Other addresses **must** be programmed.

It is also possible to have multiple self addresses for multiple networks. In this case, the transceiver is capable of "listening" for transmissions for more than one address simultaneously, however, the channels would need to be duplicated and allocated accordingly. Once for each address.

To add an address, click  to add a row to the Address table. Each of the fields can be modified as below:

Alias: a user entered name used to distinguish between addresses

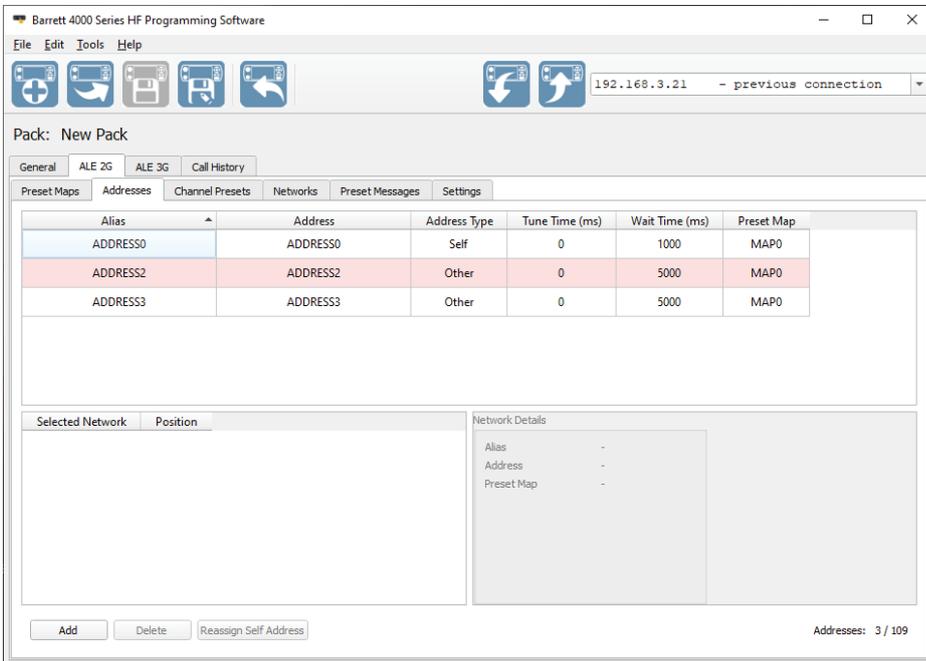
Address: the address designated to a specific ALE enabled transceiver. It is 3-15 Alpha-numeric characters.

Address Type: Can be either "Self" (your radio) or "Other" (other radios in the network)

Tune Time: the amount of time allowed for antenna tuning

Wait Time: The amount of time spent listening for a transmission from a remote transceiver.

Preset Map: designates the Preset Map this address is a part of.



Note: a Self-Address cannot be simply changed from one address to another. To change a Self-Address, select the Self-Address and then the "Reassign Self Address" button located next to the "Add" and "Delete" buttons at the bottom of the window and then select the Address you wish to change to Self-Address.

3. Establish Channel Presets

Channels in the transceiver are not automatically 2G or 3G enabled. The channels must first be brought into the Channel Presets section of the Programming Software. If any channels are already ALE enabled, they will appear in this window.

Pack: New Pack

General ALE 2G ALE 3G Call History

Preset Maps Addresses Channel Presets Networks Preset Messages Settings

Channel Number	Sounding	Sounding Address Alias	Sounding Interval (hh:mm)	Sounding Offset (hh:mm)	Response Blocked	Rx Freq (kHz)
1	<input type="checkbox"/>	ADDRESS0	01:00	00:00	<input type="checkbox"/>	8,000.000
2	<input type="checkbox"/>	ADDRESS0	01:00	00:00	<input type="checkbox"/>	8,000.000
3	<input type="checkbox"/>	ADDRESS0	01:00	00:00	<input type="checkbox"/>	8,000.000

To add a channel to this list, click the “Add” button until the desired channel number is added. Clicking a channel and clicking “delete” will remove a channel from this list and any ALE capabilities from the channel.

For information on Sounding Intervals and Offsets, refer to [page 40](#).

Selecting the Response Blocked Column will stop the transceiver from responding to Soundings on that channel.

4. Add Channel Presets to a Preset Map

Returning to the Preset Maps tab, an Alias is the name given by the user to the preset map. The default alias is MAP1.

To add channels into a preset map, select them from the lower left panel. Select and click  to add them to the preset map. The channel will then move to the right hand panel. Select and click  to remove a channel from the Selected Channels list.

5. Sounding Settings

Sounding is the testing of selected channels in a Preset Map for quality by providing a brief identifying transmission that may be used by other transceivers to evaluate connectivity, availability and to identify known working channels for immediate or later use for communications or calling. This allows for greater efficiency in channel selection and communication.

The Sounding Settings can be found on the right hand side, under the Settings tab.

The screenshot shows the 'Settings' tab with the 'Sounding' section highlighted in red. The 'Sounding Control' dropdown is set to 'Disabled'. The 'Sounding Address' dropdown is empty. The 'Sounding Conclusion' dropdown is set to 'T'WAS'. The 'Sounding Interval (hh:mm)' is set to '00:30'. The 'Sounding Offset (hh:mm)' is set to '00:00'. The 'Sound Length' section has the 'Auto' radio button selected, and the 'Length (sec)' dropdown is set to '100'. Other settings visible include 'Accept Anycalls', 'Accept Allcalls', 'Accept Wildcard Calls', 'ALE State' (Disabled), 'Response Control' (Enable (Global)), 'Listen Time (1/3 words)' (10), 'Activity Timeout' (Timeout (sec) 180), 'Scan' (Preset Map: MAP0, Scan Rate: 2 channels per second, Retries Per Scan Table: 2, Call Retry Limit: 50), and 'LQA' (LQA Exchange: checked, LQA Exchange Mode: Immediate Measurement, LQA Decay Rate: 4 hours, LQA Averaging: No Averaging, Threshold Test: None, SINAD Threshold (dB): 10, BER Threshold (0:best ... 30:worst): 30, Recommended Thresholds: Voice / Data System, ALE Only).

Sounding Control

- The default setting for Sounding Control is "Disabled" and the Sounding call will not be available under the ALE 2G section of the Call key.
- Changing this to "Individual Preset" will send Soundings only to channels with Sounding boxes ticked under the Channel Presets section of the Programming Software.
- Selecting "Enable (Global)" will enable Soundings on all channels regardless of the Soundings box being selected.

Sounding Address

This is the Self-Address programmed in the Addresses tab. If there are multiple Self-Addresses, more than one option will appear in this drop down menu.

Sounding Conclusion

There are only two possible selections for this setting: T'WAS or T'IS.

If T'WAS is selected, the sounding will be sent to a channel and a link will not be made. The transceiver will proceed to the next channel in the preset map and repeat the process. This is the default setting.

If T'IS is selected however, the sounding will be sent and a link will be made. The transceiver will not move to the next channel.

Sound Length

This denotes the length of the Sounding in seconds. The default is set to Auto. Selecting Auto will automatically calculate the required sounding length based on the ALE 2G configuration (e.g. the number of channels in the preset map, amongst other settings). This is the recommended setting. The Sound Length can also be customised to between 5 and 99 seconds.

Sounding Interval

This is the interval between Soundings. For instance, if the Sounding Interval is 30 minutes. This means that every 30 minutes a Sounding will be sent after the initial Sounding.

Sounding Offset

This delays the first sounding from midnight UTC and the first Sounding call will be made at this time. If there is no Sounding Offset, therefore the first Sounding will occur at 00:00 UTC.

Sound Length

This denotes the length of the Sounding in seconds. The default is set to 100. Selecting 100 will automatically calculate the required sounding length based on the ALE 2G configuration (e.g. the number of channels in the preset map, amongst other settings). Auto is the recommended setting.

Other Settings

Under the Settings tab, General Settings, Scan Settings and LQA Settings may also need to be established.

A description of these settings can be found below:

General Settings

Accept Anycalls

Select this check-box to enable the transceiver to accept anycall calls ('@@?') from remote transceivers.

Accept Allcalls

Select this check-box to enable the transceiver to accept allcall calls ('@?@?' or '@A?') from remote transceivers.

Accept Wildcard Calls

Select this check-box to enable the transceiver to accept wildcard based calls (using the '?' and '@' characters) from remote transceivers.

Autofill

Select this check-box to enable Autofill.

Each time an autofill call is received, the calling station information is stored temporarily in a queue. This will enable a return call to be made to the original sender whose information may not be recorded.

ALE State

Select from the drop-down menu either: Disabled, ALE 2G, or ALE 3G.

This setting will decide the default value when the transceiver starts up. For example, if ALE 2G is selected, the transceiver will be already set for 2G. If Disabled is selected, the transceiver will need to be manually set.

Response Control

Determines whether this transceiver should respond to calls or not.

From the drop-down menu select either:

- Disabled (no response permitted),
- Enable Global (always respond), or
- Individual Preset (response is determined by the channel presets).

Listen Time

The time the transceiver listens on a channel before transmitting. Used for channel occupancy detection.

Enter a value between 0 and 99 where each value represents the length of 1 ALE word (130.66ms). The default is value is 10, i.e a delay of 1.3066 seconds.

Setting this value to 0 will disable occupancy detection.

Activity Timeout

If there is no activity on an established link for a specified time, the Activity Timeout will terminate the link. Activity is denoted by PTT and ALE calls. Select either:

- No Timeout (will never timeout), or
- Specify Timeout (a given timeout in seconds). Enter a value between 1 and 600 seconds. The default is 120 seconds.

Scan Settings

Preset Map

Select a default Preset Map from the drop-down menu. The selected Preset Map can be changed from the transceiver display via Settings<ALE (if set to 2G).

Scan Rate

The rate at which scanning occurs on a Preset Map.

From the drop-down menu, select either 2 or 5 channels per second

Retries per Scan Table

When attempting to establish a link, this indicates the number of times a complete cycle of the scan table should be accomplished before failing a link attempt.

Select from 0 to 99. The default is set to 2.

Call Retry Limit

The maximum number of calls to attempt before failing a link attempt.

Select from 0 to 99. The default is set to 50.

LQA Settings

LQA Exchange

Select this check-box to allow LQA information to be swapped between self and other addresses. LQA information maintains signal strength measurements for determining best channel for making calls.

LQA Exchange Mode

The mode of the exchange. Select either:

Immediate Measurement (will immediately measure quality and use this information for exchange), or

Value from LQA Memory (will use a pre-measured value for exchange).

LQA Decay Rate

The rate in hours for which an LQA measurement is no longer current.

This sets the artificial decay rate for the link quality information stored in the LQA tables of the transceiver.

Switching the sounding off and setting a decay rate of two hours would result in the recording of a perfect channel (100% channel quality) decaying to an unusable channel (0% channel quality) over a period of two hours.

From the drop-down menu select either: Disabled, or 1, 2, 4, 8, 24, or 48 hours.

LQA Averaging

The method used for calculating the current LQA measurement. It is a ratio between the old measurement (as determined by the decay rate) and the newly acquired one.

This option sets the method used to update an existing link quality value stored in transceiver when the new link quality value is lower than the stored value.

It can be set to either replace the old values with the new values or different weighted averages of the old values and new readings.

Averaging reduces the effect that one bad reading might otherwise have on a good channel. If a new reading is better than an old value, the old value is replaced by the reading. There are four different averaging formulas available.

From the drop-down menu select either: No Averaging, $(old + new)/2$, $((3*old) + new)/4$, or $((7*old) + new)/8$

Threshold Test

Used to select the type of threshold test used to determine acceptable channel quality for ALE communication.

From the drop-down menu select either: None, BER, SINAD or Both (BER + SINAD)

Sinad Threshold (dB)

Signal-to-noise and distortion ratio (SINAD) is a measure of the quality of a signal from a communications device. This option sets the SINAD threshold (in dB) at which an ALE channel is considered usable.

Select from 0 to 30.

BER Threshold

The Bit Error Rate (BER) is the number of bit errors per unit time. This option selects the BER threshold at which an ALE channel is considered usable. If the required BER is not reached in the reply from the remote station, the link establishment process is rejected. Depending on the retry setting, the link establishment would continue on another link.

Select from 0 to 30.

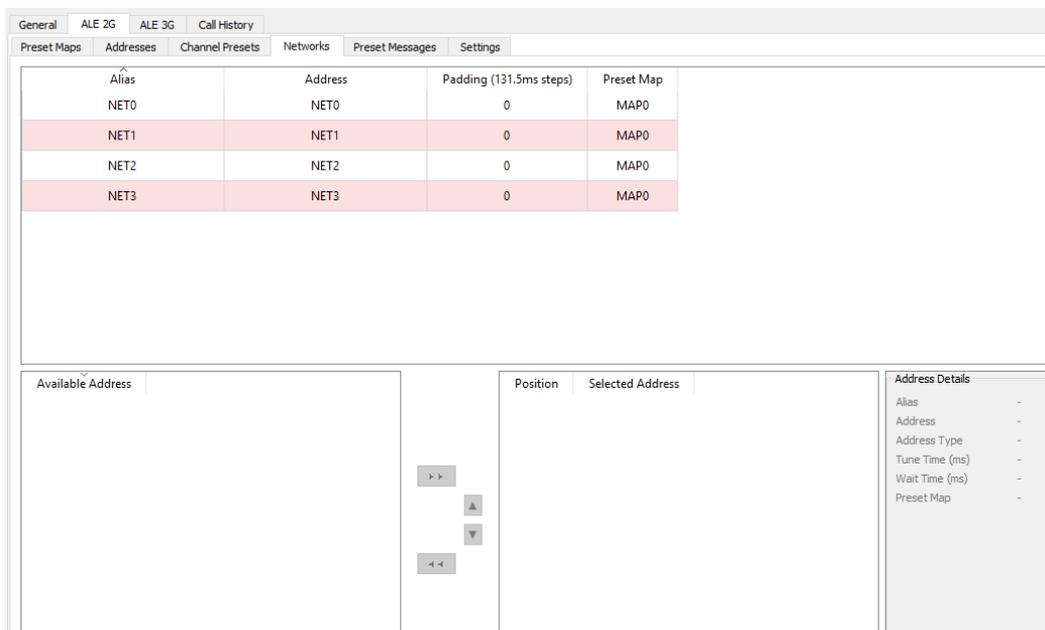
Recommended Threshold Settings

Click the **Voice/Data System** button to set the Threshold Test to SINAD, the SINAD threshold to 10 and the BER threshold to 0.

Click the **ALE Only** button to set the Threshold Test to None, the SINAD threshold to 6 and the BER threshold to 30.

6. Setting Up Networks

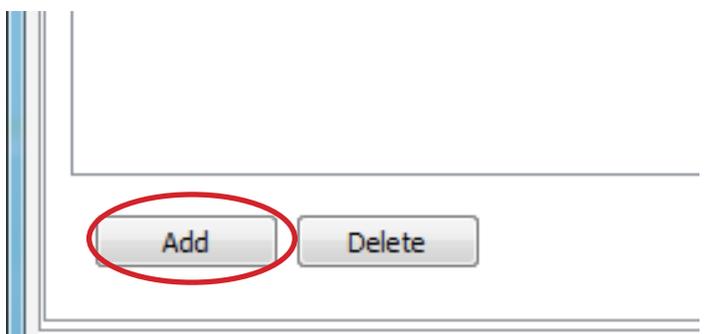
ALE Networks function as a group of Addresses or transceiver IDs specified as a particular network. This is often used for closed groups and limiting the listening patterns of the transceiver to a few specific "other" transceivers. The main purpose of a network is to rapidly and efficiently establish links with multiple transceivers that share the network address. It is possible to have 20 networks at once with up to 15 addresses each.



To create a new network, click "add" in the bottom left-hand corner of the programming window.

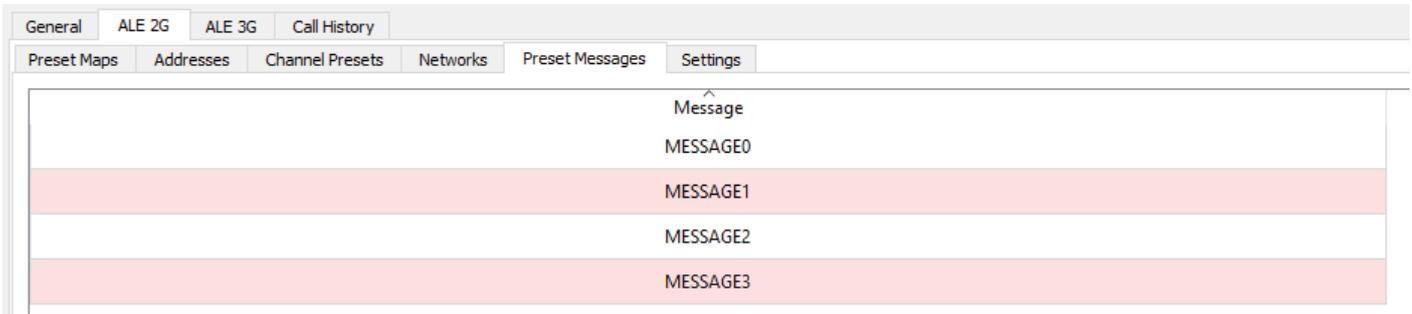
Addresses can be added to Networks the same way that channels were added to Preset Maps. The available addresses appear in the lower left box and can be added to the selected network by clicking the  button. Likewise, selecting a channel from the lower right hand box and clicking  will remove an address from the selected network.

To delete a network entirely, select it and click the "Delete" button, found next to the "Add" button.



7. Preset Messages

Preset Messages are optional and do not affect the transceiver's ability to send an ALE 2G Message in any way. Pre-programming messages can be an efficient use of time if there is a message that is sent regularly as typing the message out every time can become repetitive.



To add a preset message, click to add a row to the Preset Message table.

Double-clicking this new message allows it to be edited and the old message over-typed with the new one.

To delete a selected Preset Message, select a Preset Message and click .

For more information concerning ALE 2G and ALE 3G, please consult the ALE 2G and ALE 3G User Guide (P/N BCM40524).

Addresses

To add an address, click to add a row to the Address table. Each of the fields can be modified as below:

Alias	Address	Scan Group	Self Address	Master Address	Tune Time (sec)
ADDRESS0	0	0	Self	Master	0
ADDRESS1	1	0	-	-	0
ADDRESS2	2	0	-	-	0
BROADCAST	1023	0	-	-	0

Alias: A user given name used to identify the address to the user.

Address: In ALE 3G, addresses are automatically generated and don't need to be modified. However, it can be changed to a value between 0 and 1022.

Scan Group: refers to the network the address is a part of. All address will be set to scan group 0.

Self Address: Designates which address refers to the current transceiver.

Master Address: One of the addresses must be designated as Master for the network as this station will be responsible for managing time synchronisation across the network.

Tune Time: Time allowed for tuning that particular station.

To delete an address, click on it and then press .

Pool Entries

Pool entries are the equivalent of a scan table (non-ALE setup) or a preset map (ALE 2G).

To add a pool entry, click to add another row to the Pool Entry table.

Only the channel number can be changed here. All pool entries will be set to Search and Traffic.

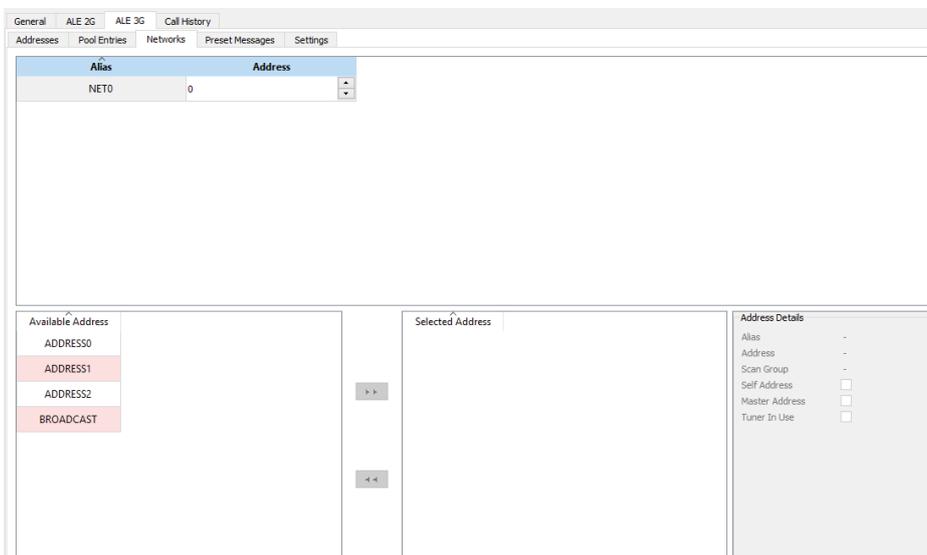
Channel Number	Channel Use
1	Search & Traffic
2	Search & Traffic
3	Search & Traffic

To delete a Pool Entry, select a row and click .

Networks

Networks can be configured using this tab. A network is a sub address that a group of addresses belong to. Networks are associated with a preset map (scan table). The main purpose of a network is to rapidly and efficiently establish links with multiple transceivers that share the network address.

To add a network, click  to add another row to the Network table.



The available addresses appear in the lower left box and can be added to the selected network by clicking the  button (Use the Ctrl key to select multiple networks). The Address details for a particular address are displayed on the right hand side.

Selecting a channel from the right hand box and clicking  will remove an address from the selected network.

Settings

General Settings

ALE State

From the drop-down menu select either: Disabled, ALE 2G, or ALE 3G.

This setting will decide the default value when the transceiver starts up. For example, if ALE 3G is selected, the transceiver will be already set for 3G upon start-up. If Disabled is selected, the transceiver will need to be manually set. See ALE User guide.

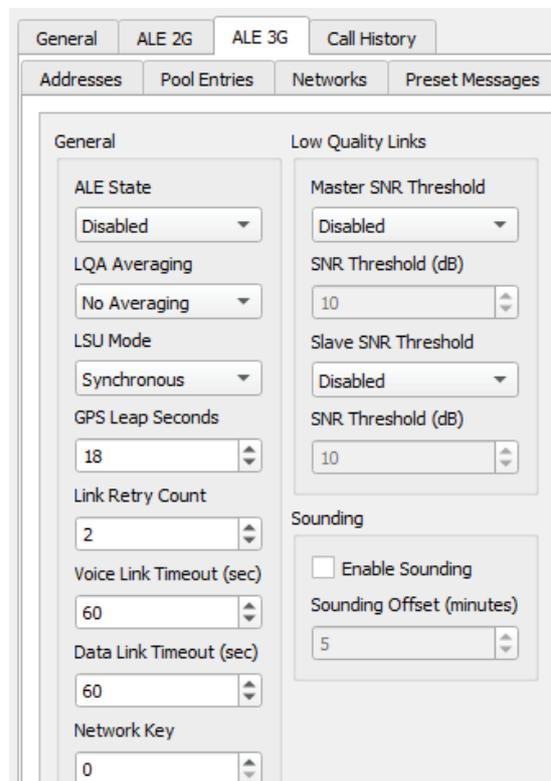
LQA Averaging

From the drop-down menu select either: No Averaging, $(old + new)/2$, $((3*old) + new)/4$, or $((7*old) + new)/8$

This is the method used for calculating the current LQA measurement. It is a ratio between the old measurement (as determined by the decay rate) and the newly acquired one.

This option sets the method used to update an existing link quality value stored in transceiver when the new link quality value is lower than the stored value.

It can be set to either replace the old values with the new values or different weighted averages of the old values and new readings.



Averaging reduces the effect that one bad reading might otherwise have on a good channel. If a new reading is better than an old value, the old value is replaced by the reading. There are four different averaging formulas available

LSU Mode

3G ALE may operate in one of two distinct modes; Synchronous and Asynchronous.

Synchronous

This mode requires a GPS (P/N BCA40009) to be fitted to the transceiver as this is used for UTC time synchronisation. In synchronous mode, all transceivers in the network - that are synchronised with the Master - will all scan synchronously. This means that all transceivers in the network are listening to the same channel at the same time.

Asynchronous.

This mode does not require the use of a GPS receiver for time synchronisation. It assumes that all the other radios on the network are using a different time reference. The result is that any call to another station needs to be long enough to ensure that the receiving station scans to that channel during the call.

GPS Leap Seconds

As of 31/12/2016, 18 leap seconds have been added to the UTC since GPS inception. This should be left at the default setting of 18 unless communicating with a earlier model radio (such as a Barrett 2050) when it should be set to 17.

Link Retry Count

The link retry count is a representation of how many attempts will be made to contact a remote station. The chosen value will determine number of subsequent retries (call attempts). The default value is 2. Select a value between 0 and 254.

If for example, the link is unsuccessful the first time an attempt is made to initiate a call and the chosen value is 2, the calling station will then make 2 more attempts to contact the remote station, first calling on the channel with the best recorded LQA result, if not successful will then attempt on the next best recorded LQA result.

Voice Link Timeout

After the voice call link has been established, this setting determines how long the link will remain open without any transmission.

Select a value between 1 and 3600 seconds. Setting the value to 0 means there will be no timeout.

Data Link Timeout

After the data call link has been established, this setting determines how long the link will remain open without any transmission between the stations.

Select a value between 1 and 3600 seconds. Setting the value to 0 means there will be no timeout.

Network Key

A network key can arbitrate between recipients and other transceivers that may have the same channel and / or address. The caller and intended recipient must have the same network key to communicate.

Select a value between 0 and 8191.

Low Quality Links

Master SNR Threshold

3G has the ability to reject links. If the Signal-to-Noise (SNR) ratio reaches a particular low level, voice will be undecipherable. As the SNR will be different for both ends of the link, the Master SNR and Slave SNR will need to be set.

From the drop-down menu select either: Disabled, Automatic, or Specified

SNR Threshold (dB)

If the Master SNR Threshold has been set to Specified, enter a value for the Master SNR Threshold in dB (between -10 and +54).

Slave SNR Threshold

Refer to the description for Master SNR Threshold, above.

From the drop-down menu select either: Disabled, Automatic, or Specified.

SNR Threshold (dB)

If the Slave SNR Threshold has been set to Specified, enter a value for the Slave SNR Threshold in dB (between -10 and +54).

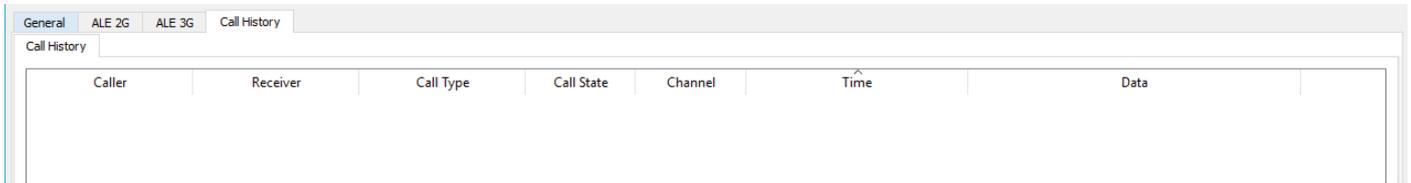
SoundingEnable Sounding

Check the box to enable soundings. When ALE 3G sounding is enabled, a sounding signal will be sent on a fixed interval defined by the sounding Offset

Sounding Offset (minutes)

The Sounding offset determines when the sounding signal will be sent. It is defined as minutes from the hour i.e. Setting the offset to 15 will result in soundings being sent at 15 minutes past the hour, every hour.

Call History



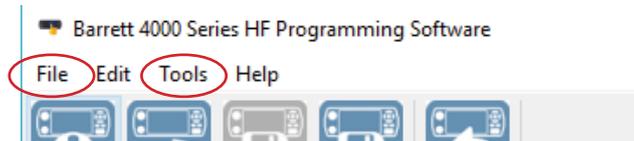
Caller	Receiver	Call Type	Call State	Channel	Time	Data
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This tab incorporates data retrieved from a pack's Advanced Call History menu. For more information on the use of Advanced Call History, please refer to the 4050 HF SDR Transceiver User Manual (P/N BCM40500).

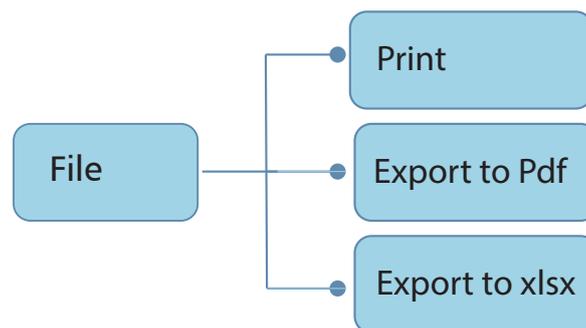
From here, the call history can be printed, exported to pdf or xlsx formats. This can be useful for archival or forensic purposes.

ADDITIONAL FEATURES 6

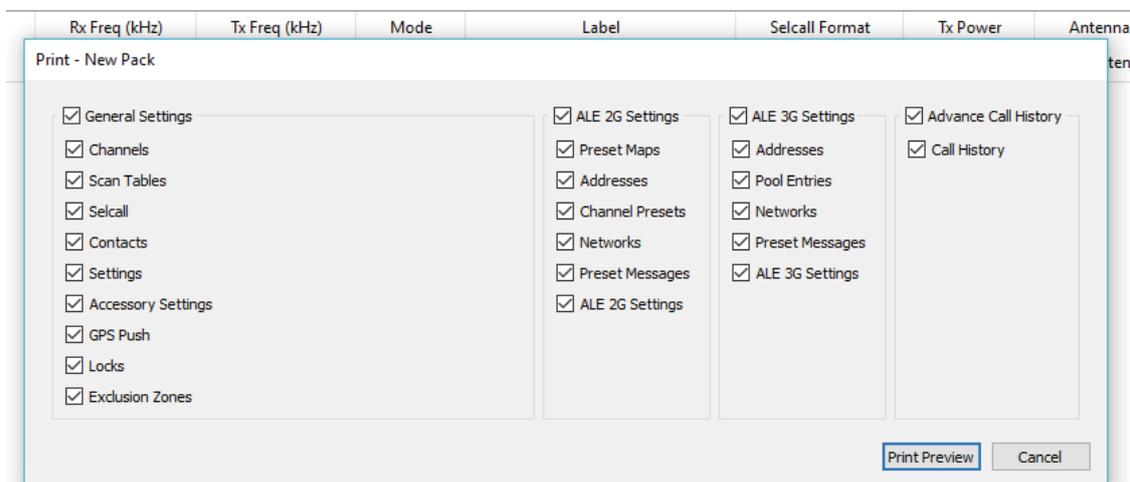
The Barrett 4000 Series HF Programming Software also has additional features for the benefit of network administrators. These are accessed from the main screen via File and Tools.



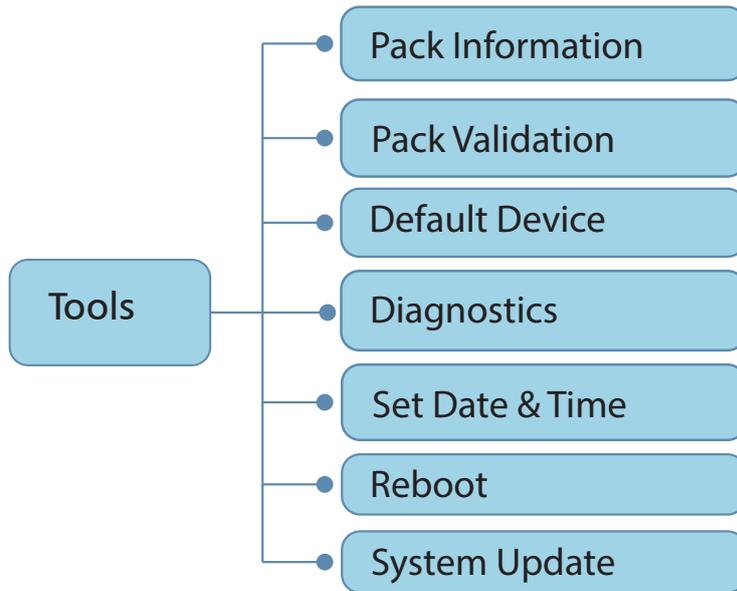
File Menu



From the File menu, a pack can be printed and exported into one of two formats - PDF or xlsx. Each option displays the dialogue box shown below where each of the Programming Software tabs can be selected or deselected depending on user requirements.

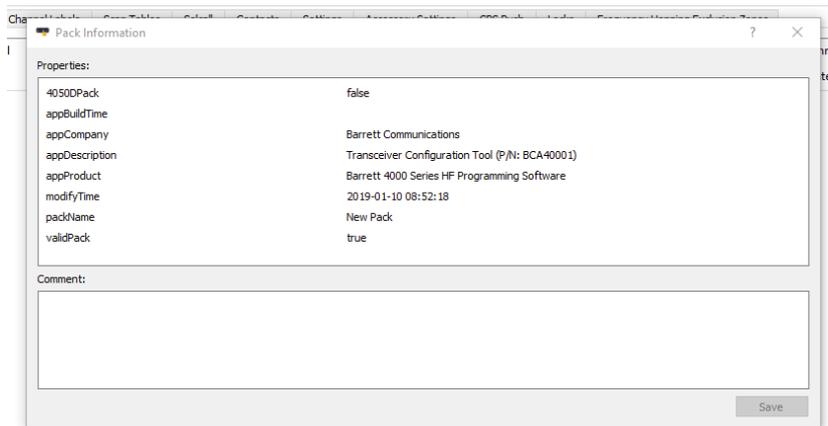


Tools Menu



Pack Information

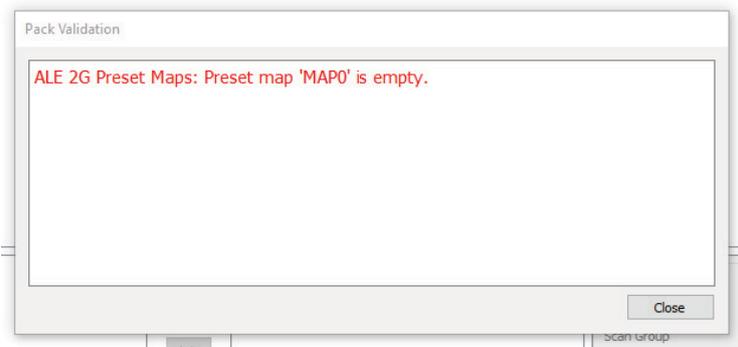
This window shows specific information about the pack currently open such as whether it has 4050D constraints enabled, the validity of the pack and when it was last modified. The comments field is designed to allow a user to make notes on or about the pack e.g. ALE Only Pack or set up for night transmissions.



Pack Validation

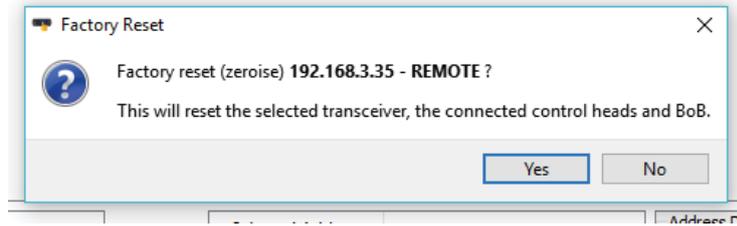
While Pack Information can tell a user whether a currently open pack is valid, it is Pack Validation that can pinpoint discrepancies in the set-up.

This validation can be executed manually by pressing F5 or via the Tools menu, but it will also run automatically upon exporting directly into a transceiver and upon saving, indicating, in red, the tab the error occurs under and the specific error.



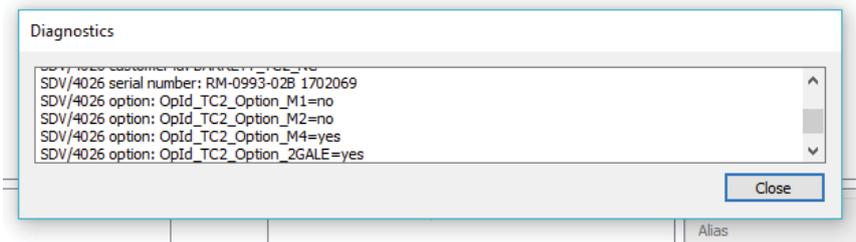
Default Device

Factory resetting a connected transceiver reverts all settings back to factory default. Zeroising removes all data from the control head and the BoB while leaving the serial number, installed options and the transceiver lock PIN unchanged. Factory reset can be completed manually on the transceiver by pressing the power button and then holding down the left arrow key.



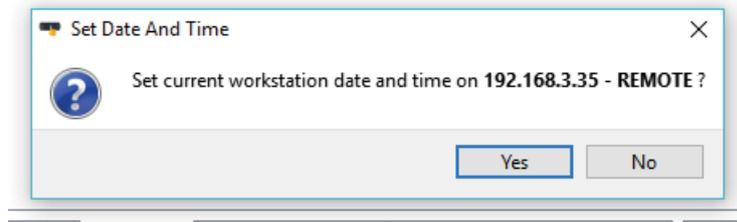
Diagnostics

Diagnostics generates information useful for diagnosing problems with a transceiver over a network. Amongst other information, it provides an administrator with specifics on software, firmware and hardware versions which may help in diagnosing a specific problem.



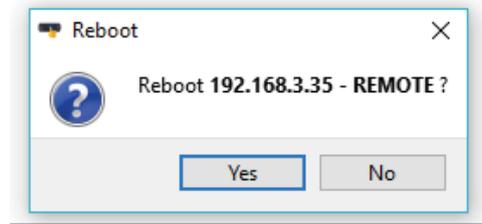
Set Date & Time

This feature synchronises the transceiver date and time with that of the workstation running the programming software.



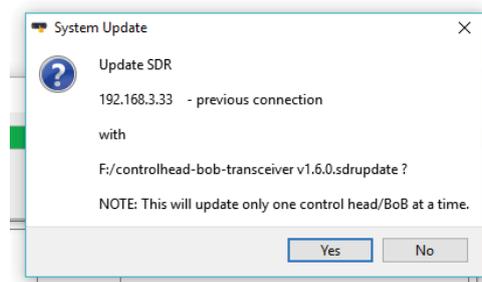
Reboot

When Reboot is selected, the connected transceiver will restart.



System Update

This feature allows a transceiver and control head to be updated remotely. This requires an appropriate update file be accessible by the administrator. It is important to note that a control head and a BoB will not update simultaneously and updating one will not update the other. As each control head and BoB has a different IP address, each device will need to be connected to and updated separately.



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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